



1232260  
[0078955H]

MEETING NOTES

Waste Management Area C RCRA Facility Investigation Report

MEETING DATE: November 18, 2015

LOCATION: Washington State Department of Ecology Office, Richland, WA

ATTENDEES:

- |                            |                             |                         |
|----------------------------|-----------------------------|-------------------------|
| Alaa Aly (CHPRC/INTERA)    | Andrea Hopkins (WRPS)       | Beth Rochette (Ecology) |
| Mike Barnes (Ecology)      | Mahmudur Rahman (INTERA)    | Maria Skorska (Ecology) |
| Marcel Bergeron (WRPS)     | Dan Parker (WRPS)           | Cindy Tabor (WRPS)      |
| Damon Delistraty (Ecology) | Anna Radloff (WRPS)         | Eileen Webb (Freestone) |
| Jim Field (WRPS)           | Julie Robertson (Freestone) |                         |

**PURPOSE OF MEETING:** The meeting was called to promote Ecology, EPA, DOE, and WRPS discussion about comments associated with and revision of RPP-RPT-58339, Rev. A Draft *Phase 2 RCRA Facility Investigation Report for Waste Management Area C* (WMA C RFI Report). The report was submitted to Ecology and EPA in December 2014 to meet *Hanford Federal Facility Agreement and Consent Order* (HFFACO) Milestone M-045-61. Ecology's February 23, 2015 response to the RFI report submittal (Letter 15-NWP-37) noted that holding "a recurring meeting to discuss statements, regulatory interpretations, and the process steps for obtaining an agreeable RFI/CMS process for WMA C Closure" would be beneficial. Lists of expectations, agreements, and actions (including the status of any actions) are documented in the meeting notes.

**STATUS OF PRIOR MEETING NOTES:** Ms. Robertson provided the meeting notes from the October 28, 2015 meeting for signature.

**BRIEF BACKGROUND ON BASELINE RISK ASSESSMENT (BRA) REPORT AND PLANNED REVISION:**

Mr. Bergeron reported that an initial BRA (*Baseline Risk Assessment for Waste Management Area C*, RPP-RPT-58329, Revision 0) was prepared in parallel with the development of the Rev. A draft of the WMA C RFI Report. The initial BRA was based on information gathered during the Phase 2 remedial investigation of WMA C input into the Washington State Department of Ecology *Model Toxics Control Act* three-phase partitioning model described in WAC 173-340-747. A revision of the BRA is in progress. The revised analysis will use additional data input into a site-specific model.

**DISCUSSION OF SELECT ECOLOGY COMMENTS:** WRPS provided a hand-out (Attachment) of Ecology comments on the BRA.

- The attendees tentatively agreed to the proposed resolutions for the following comments from Dr. Delistraty, pending their incorporation into the revised BRA: 2, 3, 4, 7, 8, 10, 11, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 41, 42, 46, 47, 49, 50, 51, 54, 55, 58, 59, 62.
- The attendees tentatively agreed to the following changes to proposed resolutions, pending incorporation into the revised BRA:
  - Comments 5 and 45: There appears to be a disconnect with respect to the number of analytes for which no toxicity values are available in the document and the proposed response. The text will be updated to make them consistent throughout the document.
  - Comment 6: Revised text provided in proposed resolution needs to clarify the word "few."
  - Comment 9: "Potential retrieval leak" will not be excluded.
  - Comment 18: In the text or a footnote, provide additional documentation related to discussion with the developers for not using ProUCL Version 5.
  - Comment 38: The text will be clarified to say that EPC includes both Max and 95% UCL.

- Comment 48: Dr. Delistraty feels strongly that Tier 2 values should be used for plants and animals because they are site-specific. The analysis will be revised to focus on Tier 2, but supplemental information will be added to the revised BRA that discusses ecological SSLs/SLERA approach.
- Comment 53: Add information to the text related to inhalation of metals.
- The attendees felt that further evaluation and discussion of the following comments is needed:
  - Comment 12: Revised Figure 3-1 will include all complete pathways. Clarifying text will be added to the document to describe how the various pathways were evaluated, because not all complete pathways were evaluated in the same manner. The following additional pathways will be shown as complete: Under **WAC Residential and Industrial Worker**, ingestion of surface water, ingestion of fish, ingestion of groundwater, inhalation during showering, and direct contact/dermal contact (10 boxes total); under **CERCLA Residential**, ingestion of surface water, ingestion of fish, and ingestion of sediment (3 boxes total); under **Tribal** scenarios, ingestion of surface water, ingestion of fish, and ingestion of sediment (6 boxes total). Under **CERCLA Residential** and under both **Tribal** scenarios, where exposure medium = groundwater, an exposure route for ingestion of irrigated crops should be added and shown as complete. Under **Tribal** scenarios, exposure media = groundwater and surface water, exposure routes should be added and shown as complete for sweat lodge. Additionally, the footnotes shown on Figure 3-1 (except for direct contact external gamma) will be deleted and instead explained in the document text.
  - Comment 15: Ecology expressed concerns about the proposed resolution. Dr. Aly took an action to review the concern and proposed resolution.

**EXPECTATIONS, AGREEMENTS, AND ACTIONS:** Refer to the tables below.

**EXTENSION ON COMMENT RESPONSES AND PATH FORWARD:** Ms. Tabor stated that DOE is preparing to send a letter to Ecology requesting an extension from the December 5, 2015 comment response due date established in Letter 15-TF-0071, Kevin W. Smith (DOE) to Jane A. Hedges (Ecology) dated August 3, 2015. The forthcoming letter will propose a new comment response date in May 2016 to allow time for the agencies to continue resolving RFI report comments via these routine RFI report meetings. Mr. Barnes stated that Ecology agrees to the extension.

**NEXT MEETING:** The next meeting was tentatively set for the third week of December 2015, with the topic being continued discussion of Ecology comments on risk assessment documents.

Ryan E. Beach  
DOE Project Manager (print)

Ryan E Beach  
DOE Project Manager (signature)

12/17/15  
Date

Michael W Barnes  
Ecology Project Manager (print)

Michael W Barnes  
Ecology Project Manager (signature)

12/17/15  
Date

DATE	AGREEMENTS
04/15/2015	<p>1. Regarding references in RPP-RPT-58339, Rev. A Draft <i>Phase 2 RCRA facility investigation Report for Waste Management Area C</i> to RPP-PLAN-37243 <i>Phase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas</i>:</p> <ul style="list-style-type: none"> <li>• References in the draft RFI report are adequate as is and do not require modification.</li> <li>• The HFFACO milestone (M-045-58) associated with the Master Work Plan is complete.</li> <li>• It would be beneficial to continue discussion on the topics covered in the Master Work Plan.</li> </ul>

ACTIONS			
Action Number	Actionee	Description	Status
2015-08-26-1	Cindy Tabor	Evaluate whether internet links to reference documents can be added to the RFI report.	In progress.
2015-10-28-1	Mike Barnes	Ms. Tabor, Ms. Radloff, and Messrs. Barnes, Caggiano, and Bergeron will work together to clarify what groundwater technical information Ecology needs to see in the RFI report. The parties will also identify whether that information is in 200-BP-5 documents, and if so, where.	In progress. The parties have been meeting to discuss the action.
2015-10-28-2	Ryan Beach	Based on input from Action 2015-10-28-1, DOE-ORP and -RL will meet to discuss how the necessary groundwater information could be provided to Ecology.	Open.
2015-10-28-3	Cindy Tabor	Regarding WMA C tank and soil inventory/leak information, WRPS/DOE will prepare a table with values to be used as the basis for corrective action decision making and will provide the basis information (e.g., reference documents) as footnotes/supporting information. Information in the table will be reviewed in a future meeting, the table incorporated into the meeting notes, and the notes entered into the HFFACO Administrative Record.	In progress.
2015-11-18	Alaa Aly	Review Ecology comment 15 on BRA (RPP-RPT-58329, Rev. 0) based on the discussion held 11/18/2015 and revise the proposed resolution as appropriate.	New.

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	2	P 1-1. S 1.1. L 30-31	The "protection of groundwater pathway" evaluation should cite Section 3.5.11 and should note that only nonrads are evaluated in this BRA (another example of fragmentation).	BRA	Concur. Two sentences between lines 31 and 33 will be modified as follows:  "An assessment is performed as part of the WMA C BRA (section 3.5.11) to evaluate the potential impacts to groundwater from migration of nonradiological contaminants in contaminated soil through the vadose zone to the aquifer. No evaluation was performed for radiological COPCs in the vadose zone in this BRA. Radiological contaminants in the vadose zone will be evaluated using vadose zone models developed in support of the WMA C Performance Assessment."	
Damon	3	P 2-5. S 2.5. L 1-8	Note that the MTCA point of compliance (POC) for groundwater protection is throughout the vadose zone (ground surface to groundwater) (WAC 173-340-740[6][b]).	BRA	Concur. The following text will be added:  "The MTCA point of compliance (POC) for groundwater protection is throughout the vadose zone (ground surface to groundwater) (WAC 173-340- 740[6][b]). Therefore, during the "protection of groundwater pathway" assessment, the sampling results for both shallow and deep vadose zone are included during the protection of groundwater evaluation."	
Damon	4	P 3-2, S 3.0, L 5	Add WAC 173-340-720 (groundwater cleanup standards).	BRA	Concur. WAC 173-340-720, "Groundwater Cleanup Standards" will be added to the list.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	5	P 3-3, S 3.1.1. L 37-42	<p>Text describes one COPC exclusion criteria as, "Analytes without Known Toxicity Information." This exclusion should be described as an uncertainty. A recent editorial in Toxicol Sci notes, "Surprisingly, the current model deems that if we have no reliable toxicity data for a given chemical then it must be assumed to be safe. Although we may be blissfully ignorant of the toxicity this could indeed be very dangerous for the health of the human race and for the planet" (Miller, 2015)</p> <p><a href="http://toxsci.oxfordjournals.org/content/early/2015/02/25/toxsci.kfu310.full.pdf">http://toxsci.oxfordjournals.org/content/early/2015/02/25/toxsci.kfu310.full.pdf</a></p>	BRA	<p>Concur with the statement. Section 3.6.3, P 3-95, Lines 9 to 15 provided information related to analytes with no toxicity as a part of the uncertainty analysis. However, the text will be updated as follows for further clarification:</p> <p>"Human health risk assessment was performed for radionuclides, metals, VOC, SVOCs/PAHs and pesticides/herbicides. Toxicity information was not available for 2 radiological indicator parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 10 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes, and were used when they were detected during radiological risk assessment. Among 2 VOCs, one has not been detected and the other, (m+p)-Xylene was detected in one sample out of 47 samples with a very low concentration (less than 1% of the screening values for the surrogate compounds). None of the SVOCs and pesticides were detected. Because of the lack of detection, those analytes will not contribute to the total risks."</p>	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	6	P 3-4, S 3.1.2, 1.3-5	Eliminating nondetects is appropriate only if detection limits are sufficiently low (e.g., at established PQLs).	BRA	<p>Concur with the statement. Therefore, the following text will be added for clarification:</p> <p>"Both human health risk-based screening levels and ecological screening values were considered during the selection of the detection limits achievable for each of the analytes evaluated. The results for WMA C Phase 2 RFI samples were reported to the laboratories' method detection limit (MDL). The MDL is the lowest concentration at which an analyte can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. If an analyte is not detected at a concentration greater than or equal to the MDL, it cannot be stated that the analyte is not present in the sample; but rather, with 99% certainty, the analyte is not present at a concentration greater than or equal to the MDL. Few sampling results for a number of COPCs were reported as not detected at MDLs exceeding required detection limits listed in RPP-PLAN-38777. "</p>	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	7	P 3-6, Table 3-1	Aroclors 1254 and 1260 are listed as COPC's in Table 3-1. A more informative, accurate, and sensitive measure of PCBs is quantitation of individual congeners, since commercial Aroclor mixtures are weathered (transformed) in the environment. In addition to summing congeners to evaluate total PCBs, individual congener analysis also allows evaluation of dioxin-like PCB congeners.	BRA	Concur. The following footnote will be added to provide the explanation:  Initially, PCB congener analytical results were obtained from selected direct push boreholes around WMA C. Based on review of these PCB congener analytical results, in a letter to the Ecology [Letter 11-TPD-020, "Organic Analyses Optimization for Waste Management Area (WMA) C"], a recommendation was made to eliminate analysis of PCB congeners in further WMA C sampling activities, but continue to perform analyses of PCB Aroclors. This recommendation was approved by Ecology [Letter 11-NWP-053, "Re: Organic Analyses Optimization for Waste Management Area (WMA) C"]. Therefore, no individual congener evaluation was performed in this BRA.	
Damon	8	P 3-7, S 3.2.1.1, L 13	Text lists, "an environmental transport medium," as required for a complete exposure pathway. Note that this component is not needed for external radiation.	BRA	Concur. Line 9 will be replaced as follows:  "Except for external gamma pathway, all of the following components must be present for a complete exposure pathway. An environmental transport medium is not required for external gamma pathway."	
Damon	9	P 3-7, S 3.2.2.1, L 31-33	Text notes that only contaminants in the vadose zone (UPRs or planned releases) and surface soils (past operations) are addressed in this BRA. However, Figure 3-1 also includes "potential retrieval leaks." Please reconcile. Clarify why contaminants in residual waste in tanks and ancillary equipment are excluded in the BRA.	BRA	Concur. Four sources were identified for WMA C - Past Leaks, Release from Residual Tank Waste, Release from Ancillary Equipment, and Wastes from nearby properties. Figure 3-1 will be updated by deleting "Potential Retrieval Leak" and adding two additional sources identified above.	
Damon	10	P 3-7, S 3.2.1.2, L 39-40	Text lists migration of contaminants via infiltration, percolation, or leaching, but Figure 3-1 does not. Please reconcile.	BRA	Figure 3-1 will be updated to include both primary and secondary release mechanism. The updated figure will include migration of contaminants from soil to groundwater via infiltration, percolation or leaching.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	11	P 3-8, S 3.2.1.2.1, L 1-7	Text lists emission of dusts and vapors, generation of dusts, and volatilization of COPCs, but Figure 3-1 does not. Please reconcile	BRA	Please see response to comment 10. Release mechanisms in the air through the generation of dust through wind erosion and volatilization of vapors will be included in the revised figure.	
Damon	12	P 3-9, Figure 3-1	For transparency, Figure 3-1 should be labeled as human health conceptual exposure model and should present all exposure pathways (even if all are not evaluated). Therefore, in addition to soil ingestion and soil inhalation, MICA (WAC 173-340) includes soil dermal contact and soil contaminants leaching to groundwater with subsequent ingestion of groundwater by residential receptors. Also, CERCLA includes soil contaminants leaching to groundwater with subsequent ingestion of groundwater by residential and tribal receptors or other subsequent uses (e.g., showering, irrigation of crops). Contaminated groundwater may also impact fish in the Columbia River which may be consumed by residential or tribal receptors.	BRA	The title of the Figure 3-1 will be labeled as "Human Health Conceptual Exposure Model"  Both complete and incomplete exposure pathways will be included in the updated Figure 3-1.	
Damon	15	P 3-13, S 3.2.1.4.2, L 7-8	Dermal contact may also be evaluated for MICA Method C industrial worker scenario (WAC 174-34-745[5][c][iii]).	BRA	Concur. The following text will be added to Section 3.2.1.4.2:  Dermal contact pathway is applicable for petroleum mixture hydrocarbon. However, petroleum mixture is not a contaminant of concern for WMA C.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	18	P 3-16, S 3.2.2, L 37	ProUCL 4.00.05 has been updated. Please use ProUCL 5.0 (Sept 2013) ( <a href="http://www.epa.gov/OSP/hst/tsc/software.htm#about">http://www.epa.gov/OSP/hst/tsc/software.htm#about</a> ).	BRA	<p>In general, the comment is correct about using the most up-to-date guidance and tools for the risk assessment. ProUCL 5.0 was considered for the WMA C BRA (and other BRAs). However, initial testing and evaluation of ProUCL v5 revealed some issues related to the estimation of the population mean using the Kaplan-Meier (KM) method. To understand the reasoning behind the change, correspondence with ProUCL's developers was initiated and they provided an explanation for the change which is being reviewed. Another issue (considerably long time to save results) was discussed with the developers and they indicated they would try to address it in version 5.1. Unfortunately, version 5.1 has not yet been released. This makes the use of version 5.0 extremely time consuming.</p> <p>In the meantime, literature search was conducted about the application of ProUCL version 4 for various projects. This showed that the KM results produced in ProUCL version 4 agree with studies conducted at other sites using SAS (Beal 2009; USGS NADA package using R; independent test cases used to qualify ProUCL at Hanford, etc.). Therefore, ProUCL version 4 model was used during this BRA.</p>	
Damon	20	P 3-18, S 3.2.3.1, L 19	Looks like AT should be in days (not hours).	BRA	Concur. AT should be in days.	
Damon	21	P 3-43, S 3.2.3.1, L 17-23	Define AT (days).	BRA	Averaging Time AT will be defined.	
Damon	22	P 3-44, S 3.2.3.2, L 14	CF is 1E-3 mg/µg.	BRA	Concur.	
Damon	23	P 3-45, S 3.3.1.1, L 20; P 3-46, S 3.3.1.2, L 15	Oral Absorption Factor (ABS) should be expressed as a fraction in these equations (not %).	BRA	Concur. The Oral Absorption Factor (ABS) will be expressed as a fraction.	
Damon	24	P 3-46, S 3.3.1.3, L 36-37	Text notes that the PPRTV database is not publicly available. This is not correct ( <a href="http://hhpprtv.ornl.gov/index.html">http://hhpprtv.ornl.gov/index.html</a> ).	BRA	Concur. That sentence will be deleted.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	25	P 3-47. S 3.3.1.3. L 9-11	According to OSWER 9285.7-53, all sources for toxicity values that are not Tier 1 or Tier 2 fall into Tier 3 by definition. Therefore, NCEA/RAIS comprise Tier 3 toxicity values.	BRA	Concur. The first sentence will be deleted. The second sentence will be modified as follows:  "The toxicity values for all chemicals found in The Risk Assessment Information System, Queried 10/2014, <a href="http://rais.ornl.gov/">http://rais.ornl.gov/</a> were considered during the toxicity assessment for this BRA."	
Damon	26	P 3-47. S 3.3.1.3. L 25-29	Clarify in text whether or not oral cancer risk will be assessed for Cr+6 with the NJDEP slope factor (0.5 [mg/kg-d] <sup>-1</sup> ).	BRA	The following text will be included for clarification:  "Risk due to ingestion pathway was not considered as its oral toxicity value, developed by NJDEP is still being evaluated by IRIS. "	
Damon	27	P 3-49. S 3.4.1.1. L 2-3	Total cancer risk for an EA is calculated by summing across carcinogenic chemicals and exposure routes.	BRA	Concur. Suggested text will be added in line 13 as follows:  "Total cancer risk for each EA is calculated by summing the excess lifetime cancer risks (ELCRs) across carcinogenic chemicals and exposure routes".	
Damon	28	P 3-49. S 3.4.1.2. L 43-44	As an initial screen, HQs for an EA are typically summed across chemicals and across exposure routes. If HI>1, chemicals are segregated by similar mode of action (chemical group), and corresponding HQs are summed within a chemical group and across exposure routes.	BRA	The suggested text will be included in this section as follows:  The noncancer hazard, HI for each EA is calculated by summing the HQs across chemicals and exposure routes. When HI>1, the chemicals may be segregated by similar mechanisms of action (critical effect) and toxicological effects, and corresponding HQs are summed within a similar mechanism of action and across exposure routes.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	29	P 3-51. S 3.4.3. L 1	Note that 1E-4 is one case in ten thousand.	BRA	The mistake in the first line will be corrected as follows:  "(i.e., one case of cancer in one million to one case of cancer in ten thousand)".	
Damon	30	P 3-51. S 3.4.3. L 6-8 and 40-41	Note here (and other places in the text) that total ELCR limit for MTCA Method C is 1E-5.	BRA	Concur. Text changes will be made throughout the document to ensure that total ELCR limit for MTCA Method C is 1E-5.	
Damon	31	P 3-52. S 3.5. L 16-17	Relegating Native American risk results to information purposes only may be perceived by Native Americans as essentially excluding these results.	BRA	Text will be modified as follows:  DOE requested and invited the American Indian perspectives to ensure fair consideration of differing views and to inform the agency's decision-making process. DOE respects those views and has considered them for the purposes of preparing this WMA C BRA and other BRAs.	
Damon	32	P 3-53. Table 3-3	Add a footnote to this table (and similar tables), noting that bold font indicates ELCR or HI limit exceedances.	BRA	The following footnote will be added for all similar tables in chapter 3:  "The bold font indicates exceedances of acceptable ELCR or HI limits."	
Damon	33	P 3-65. S 3.5.7. L 1-5	The first two sentences of this paragraph need clarification. The first sentence is nonsensical, and the second sentence does not identify an antecedent (i.e., higher risk than what?).	BRA	Text changes will be updated as follows to clarify the sentences:  For risk characterization involving nonradiological COPCs, separate risk characterizations were performed for residential adult and residential child. However, the results of noncancer hazards under residential child scenario are typically higher as compared to that for residential adult.	
Damon	34	P 3-65. S 3.5.7.1. L 30	Please add Tc-99 (see EA P for rads in Table 3-9).	BRA	Tc-99 is a major risk contributor for EA P. Therefore, it will be added along with Cs-137, Co-60, Ni-63, Se-79, Sr-90 and Sn-126.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	35	P 3-65, S 3.5.7.2, L 37-41	Re background noncancer hazard assessment. HQs should only be summed for COPCs with similar effects. Therefore, it is not appropriate to sum HQs for As, B, Co, Fe, Li, and V to calculate HI- 3 (Table 3-10). Separate background evaluations must be performed for each noncancer COPC (or COPC group), eliciting a similar effect. Resulting background HIs should then be compared with corresponding EA HIs to identify background effect.	BRA	Concur. New risk evaluation was performed. Based on the results of new risk evaluation, text will be updated as follows:  "For noncarcinogenic COPCs, all EAs report an HI greater than the 2007 MTCA target HI of 1. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, iron, lithium, manganese, and vanadium were identified as hazard contributors. Therefore, an evaluation was performed for each EA to segregate the HIs associated with those hazard contributors by similar mechanisms of action (critical effect) and toxicological effects. When the HI based on similar mechanism of action is greater than 1, those hazard contributors will be retained. However, the results of risk evaluation showed that the HI based on similar mechanism of action is less than one. Therefore, no analytes were retained as hazard contributors."	
Damon	36	P 3-67, S 3.5.8.2, L19-23	Re background noncancer hazard assessment. HQs should only be summed for COPCs with similar effects. Therefore, it is not appropriate to sum HQs for As, Co, Fe, and V to calculate HI 2.3 (Table 3-11). Separate background evaluations must be performed for each noncancer COPC (or similar COPC group), eliciting a similar effect. Resulting background HIs should then be compared with corresponding EA HIs to identify background effect.	BRA	Please see response to the comment no 35.	
Damon	37	P 3-70, S 3.5.11, L 16-21	Evaluating groundwater protection for nonrads and rads in separate reports fragments the evaluation, decreasing transparency.	BRA	Concur. The groundwater protection evaluation for the radiological contaminants will be added to this report.	
Damon	38	P 3-70, S 3.5.11, L 35-45	This data evaluation should compare EPC with CUL (first bullet) or background concentration (second bullet). In the first bullet, text specifies "maximum detected concentration and EPC," while in the second bullet, text specifies "maximum detected concentration." EPC is the key metric which includes both max detect and 95 CUL. (Table 3-2).	BRA	Concur. Instead of maximum detected concentration, new data evaluation was performed based on the results of EPCs. The results of the evaluation showed that the EPCs for cadmium, lindane and beta-BHC are greater their corresponding three-phase model calculated concentrations. Text will be updated throughout the BRA report based on the results of new data evaluation.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	39	P 3-72, S 3.5.11, L 1-29	Again, this data evaluation should compare EPC (max detect only in some cases) with CUL or background concentration.	BRA	Please see response to the comment no 38.	
Damon	41	P 3-91, S 3.6.1. L33-34	Text states, "Current baseline conditions are represented by soil data collected from 13 biased sampling locations within WMA C." Text on p. 2-1 (Line 15) indicates 14 sampling locations. Please reconcile.	BRA	We appreciate the careful review. It is correct that the text should have stated 13 locations instead of 14. The modified text is provided below:  The soil characterization data set collected for the RFI consists of sampling and analysis of soil samples collected from thirteen Phase 2 sampling locations (A, B, C, E, F, G, H, I, J, L1/L2, P, R, and U) and a limited set of soil samples collected during installation of two nearby monitoring wells (299-E27-20 and 299-E27-24). However, soil data collected from 13 judgement sampling locations were utilized during this BRA. Text changes will be made throughout the report to reconcile those statements.	
Damon	42	P 3-91, S 3.6.1. L37-38	Text states, "A total of 136 soil samples were collected at various depths (near surface [0 to 3 ft bgs], shallow surface [0 to 15 ft bgs] and deep [>15 ft bgs]) from 10 EAs within WMA C." However, Table N-1 (Appendix N) appears to show about 150 soil samples. Please clarify.	BRA	Additional samples were collected during the installation of two nearby monitoring wells (299-E27-20 and 299-E27-24). Because they are located outside the 10 exposure areas (EAs). Those two well locations were not considered during this BRA. Text changes will be made throughout the document to state that soil sampling results of 136 samples collected from 13 judgement sampling locations were utilized during this BRA.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	45	P 3-95, S 3.6.3, L 13-15	Specify how many analytes (with no tox data) appear in Table 8-2 of RPP-RPT-57218 (since this document does not appear to be available on the web).	BRA	The whole paragraph will be modified as follows:  ""Human health risk assessment was performed for radionuclides, metals, VOC, SVOCs/PAHs and pesticides/herbicides. Toxicity information was not available for 2 radiological parameters (gross alpha and gross beta), 17 metals, 2 VOCs, 10 SVOCs and 4 pesticides/herbicides. All excluded metals are radiological in nature. Only risk coefficients are available for their radiological isotopes, and were used when they were detected during radiological risk assessment. Among 2 VOCs, one has not been detected and the other, (m+p)-Xylene was detected in one sample out of 47 samples with a very low concentration (less than 1% of the screening values for the surrogate compounds). None of the SVOCs and pesticides were detected. Because of the lack of detection, those analytes will not contribute to the total risks. "	
Damon	46	P 3-96, S 3.7, L 41-43	The cumulative risk threshold for MICA Method C is 1E-5 (not 1E-6).	BRA	Text will be updated throughout the document to correct this mistake.	
Damon	47	P 3-97, S 3.7, L 24-25	Add Tc-99 (EA P in Table 3-9) as a major contributor for the CERCLA residential receptor.	BRA	Concur. Tc-99 is a major risk contributor for EA P. It will be added along with Cs-137, Co-60, Ni-63, Se-79, Sr-90 and Sn-126.	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	48	P 4-1. S 4.0. L 12-13. 37-39	Clarify why this document implements CHPRC-00784 (Tier 1 soil PRGs) but not CHPRC-01311 (Tier 2 soil PRGs) in the tiered assessment of the SLERA. Because Tier 2 values contain more Hanford site-specific information, Tier 2 values are arguably more relevant than Tier 1 values.	BRA	To be consistent with the EPA's eight-step EPA process presented in ERAGS (EPA 540-R-97-006), generic screening was performed initially for all analytes. For analytes that were retained following generic screen, Tier 1 screenings were performed during the following steps. No Tier 2 screen was performed as no nonradiological COPECs were retained after Tier 1 screen. Therefore, plant and invertebrates PRGs developed during Tier 2 were not utilized. It should be noted that,  1. Generic literature derived SSLs for plants and invertebrates are more conservative as compared to their corresponding Tier 2 PRGs. 2. Tier 1 SSLs based on NOAEL and LOAELs for analytes, passed generic screen are more conservative as compared to their corresponding Tier 2 PRGs. Therefore, Tier SSLs based on NOAEL and LOAEL will be selected as the SSLs for those analytes.  Therefore, Tier 2 PRGs will not impact the results of the SLERA.	
Damon	49	P 4-6. Table 4-1	Am-241 is listed incorrectly under nonrads.	BRA	Concur. The table will be re-formatted to fix this problem.	
Damon	50	P 4-8. S 4.3. L 40	Text refers to "Appendix D, Attachment D-1." For this SLERA, text should refer to "Appendix E, Attachment E-1."	BRA	Concur. The text will be referred to "Appendix E, Attachment E-1."	
Damon	51	P 4-9. S 4.3. L 10	Text refers to "Appendix D, Attachment D-2." For this SLERA, text should refer to "Appendix E, Attachment E-2."	BRA	Concur. The text will be referred to "Appendix E, Attachment E-2."	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

Comment From (ECY)	Item	Page #/ section # Line #	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)	Doc	Response	Accepted (A) or Need Further Discussion (NFD)?
Damon	53	P 4-11. S 4.4.1.1. L. 38-42	Text states, "Therefore, both dermal and inhalation exposure were assumed to be negligible." Re inhalation, this may not be true in burrowing animals for inhalation of VOCs (e.g., Gallegos et al. 2007 [ETC 26:1299-1303]; Carlsen. 1996 [Risk Anal 16:211-219]) and inhalation of metals (e.g., Bench et al. 2001 [ES&T 35:270-277]).	BRA	Concur. Text will be updated as follows:  "Inhalation is generally considered a relatively minor pathway for exposure relative to direct ingestion by wildlife of chemicals of concern. For example, the USEPA's <i>Exposure factors and bioaccumulation models for derivation of wildlife Eco-SSLs</i> , OSWER Directive 9285.7-55. Revised November 2005, did not use inhalation of soil particles in deriving the national ecological soil-screening levels, because exposure is accounted for by the soil-ingestion route. An evaluation of risk to receptors via the inhalation pathway may be warranted, in cases where VOCs are expected site chemicals and pathways of exposure are complete. One possible pathway for inhalation is the potential for volatilization of chemicals and exposure to burrowing animals in subsurface soils. However, methods and data necessary to calculate inhalation exposures are poorly developed (EPA/600/R-93/187). Therefore, inhalation pathway was not considered during the development of SSLs."	
Damon	54	P 4-17. S 4.4.2. L 6	Text refers to "Appendix D, Attachment D-1." For this SLERA, text should refer to "Appendix E, Attachment E-1."	BRA	Concur. The text will be referred to "Appendix E, Attachment E-1."	
Damon	55	P 4-18. S 4.4.2. L 28	Text refers to "Appendix D, Attachment D-2." For this SLERA, text should refer to "Appendix E, Attachment E-2."	BRA	Concur. The text will be referred to "Appendix E, Attachment E-2."	
Damon	58	P 4-21. S 4.6. L 44-46	Text states, "A review was performed to compare the result of the minimum detection limit for each analyte with respect to its corresponding NOAEL- and LOAEL-based SSL. For most of the analytes, no SSL was developed due to unavailability of TRVs. The minimum detection limits for the rest of the non-detected analytes are less than their corresponding SSLs based on NOAEL and LOAEL." In order to provide more specific information on uncertainty regarding nondetects, please indicate the fraction of nondetects with detection limit above their TRV, as well as the fraction of nondetects with no TRV.	BRA	The quoted text will be replaced as follows:  "A data review was performed to compare the result of the minimum detection limit for each analyte with respect to its corresponding NOAEL- and LOAEL-based SSL. It should be noted that the detection limit for analytes were based on 10% of their ecological SSLs for the most cases. The results of the data review showed that the minimum detection limit and maximum reporting limit for all non-detect sample results did not exceed their corresponding NOAEL- and LOAEL-based SSL."	

Attachment (14 pages)  
Ecology Comments on Baseline Risk Assessment

<i>Comment From (ECY)</i>	<i>Item</i>	<i>Page #/ section # Line #</i>	<i>Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/ problem indicated.)</i>	<i>Doc</i>	<i>Response</i>	<i>Accepted (A) or Need Further Discussion (NFD)?</i>
Damon	59	P 4-23. S 4.6. L 6	MTCA defines the biologically active soil zone as 0-6 ft (not 6-15 ft), per WAC 173-340-7490 (4)(a).	BRA	Concur. Per WAC 173-340-7490 (4)(a), the biologically active soil zone (a conditional point of compliance) is assumed to extend to a depth of six feet. Text will be corrected as follows:  WAC 173-340-7490(4)(a) identifies the biologically active zone extends to a depth of six feet.	
Damon	62	P 4-25. S 4.7. L 37-45	Although EA P contamination will be remediated as a result of unacceptable human rad risk. Table 4-5 identifies H-3 and Sr-90 at EA P as eco rad COPECs to be retained.	BRA	Concur. The last sentence will be modified as follows:  Both H-3 and Sr-90 will be retained as radiological COPECs in this SLERA. Those COPECs will be addressed as a part of future remedial action. Therefore, no further risk evaluation will be performed for those COPECs.	