ECF-HANFORD-17-0079
Revision 0

Hanford Soil Inventory Model (SIM-v2) Calculated Radionuclide Inventory of Direct Liquid Discharges to Soil in the Hanford Site's 200 Areas

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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RE: ECF-SIM-v2 signature

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Mon 5/7/2018 7:45 PM

To:Will Nichols <wnichols@intera.com>;

Cc:Sunil Mehta <smehta@intera.com>; Usama Zaher <UZaher@intera.com>;

As per Will Nichols recommendation and in lieu of my signature, I authorize my approval of the ECF-SIM-v2 cover page 'Environmental Calculation Cover Page', Section 4, Checker. – Michael Lord May 7, 2018

From: Will Nichols
Sent: Monday, May 07, 2018 4:41 PM
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Subject: Re: ECF-SIM-v2 signature

Mike has had issues trying to get quality scans of signature pages to us; an email authorizing approval will be sufficient as well (we can attach to the cover page). Thanks,

Will Nichols
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From: Usama Zaher
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Cc: Sunil Mehta; Will Nichols
Subject: ECF-SIM-v2 signature

Hi Mike,
How are you? Hope every thing is going great and you are enjoying summer.
Please, find attached is the SIM-v2 ECF that we are signing its cover sheet to release to public. Would it be possible to sign in front of your name in the cover sheet -section 4-checker. Returning a scan copy would be great to continue the signature cycle.
Thanks,

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Usama Zaher brings experience in wastewater engineering, bioprocess modeling and environmental sustainability assessment gained from working with research and engineering teams on diverse projects in the U.S., Europe, and the Middle East. His expertise in process modeling optimizes water quality solutions to meet environmental regulations and sustainability measures of waste and wastewater treatment services in the domestic, industrial and farming sectors. Usama is an expert in anaerobic digestion (AD) modeling, monitoring and control. His AD expertise involves contributing to the optimization of biogas plants and pre-treatment of industrial wastewater and farming wastes to recover resources and biogas for energy generation and to improve biodegradation of toxic organics. In the area of environmental sustainability, he implements multiscale and life cycle assessment mathematical and statistical modeling tools to simulate integrated environments, to analyze uncertainty, and to estimate ecological impacts and risks to support environmental technology selection and remedial decisions. He currently supports a team of modelers working on the environmental restoration efforts at the U.S. Department of Energy's Hanford Site, where his responsibilities include modeling the site-wide inventory for composite risk analysis and evaluation of waste isolation and ground water remedial actions.

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Terms

CA	(Hanford Site) composite analysis
COPC	components of potential concern
DKPRO	Fortran code to perform separations on 46 radionuclides from ORIGEN2 output
EMMA	Environmental Model Management Archive (and directory of computational files)
HDW	Hanford-defined waste model
HSW	high salt waste
IDE	integrated development environment
LSW	low salt waste
ORIGEN2	burnup code that calculates fission and activation products
OPU	operable unit
SIM	Hanford soil inventory model
SIM-v1	original SIM implementation in 2005
SIM-v2	updated SIM implementation in 2017
SMM	supematant mixing model
TRU	transuranic
WIDS	Hanford Waste Information Data System
WMA	waste management area
WSTRS	waste status and transaction record summary

1 Purpose

The Hanford soil inventory model (SIM) provides the basic radionuclide and chemical soil inventories from historical liquid discharges to about 400 sites at the Hanford Site. Although liquid discharge inventory for chemicals is part of the SIM implementation, only radionuclide inventory is discussed here since the focus of this ECF is on providing radionuclides inputs for the composite analysis (CA) per DOE Order 435.1, *Radioactive Waste Management*, requirements. Furthermore, discharged inventories are only estimated for the soluble portions of the liquid discharges to waste sites/waste management areas located on the 200 Area of the Hanford Site (Central Plateau).

Since the first release of SIM in 2005 (RPP-26744, *Hanford Soil Inventory Model, Rev. 1*), designated in this report as SIM-v1, several updates have occurred and implementation errors identified that have the potential to impact the CA. To estimate more accurately the inventory from past liquid discharges, this report serves as a revision designated as SIM-v2. The SIM-v2 incorporates the same basic information as SIM-v1 but applies corrections and updates to the input volume and waste stream compositions associated with historical liquid discharges. Although the discharged inventory results are presented for a common date of January 1, 2001 for comparison with SIM-v1, a post-processing module has been developed to regrow (decay correct) the inventory to reported discharge date for a waste site. The developed module considers both decay and ingrowth of the inventoried 46 radionuclides.

The inventory is estimated in SIM-v2 for sites that received direct liquid discharges, unplanned releases and tank leaks located on the Central Plateau of the Hanford Site. The screened sites are based on the CA technical approach document for inventory (CP-60195, *Hanford Site Composite Analysis Technical Approach Description: Radionuclide Inventory and Waste Site Selection Process*) and represents approximately 400 sites out of 690 screened sites for CA.

2 Background

The SIM-v2 is built on inputs developed for SIM-v1 and retains most of the basic information. RPP-26744 described the 2005 SIM-v1 model in detail where SIM-v1 collected waste sources, types, and compositions and classified them into 211 waste streams. Approximately 6,300 volume discharge events were modeled for the SIM sites (including unplanned releases). These were based on source references that included numerous historical waste management and surveillance documents, process engineering memos, plant flowsheets, and surveillance data. The SIM-v1 used nuclear reactor production information from ORIGEN2 (RPP-13489, *Activity of Fuel Batches Processed Through Hanford Separations Plants, 1944 Through 1989*) and the waste stream composition information from RPP-19822, *Hanford Defined Waste Model – Revision 5.0*, and LA-UR-96-3860, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model*, as well as several engineering and technical assumptions.

SIM-v1 propagated the uncertainty in discharged inventory using a Monte Carlo approach through Open Crystal Ball (OCB)[1] (now "Crystal Ball" by Oracle®) Microsoft® Excel® add. This methodology has been changed in SIM-v2, where uncertainty is propagated using a statistical approach that significantly reduces the computational burden. The SIM-v2 is implemented using GoldSim® software and the new methodology is described in CP-59798, *Model Package Report: Hanford Soil Inventory Model SIMv.2*.

[1] Open Crystal Ball was a registered trademark of Decisioneering, Inc., Denver, Colorado.
® Oracle is a registered trademark of the Oracle Corporation, Redwood Shores, California.
® "Microsoft" and "Excel" are registered trademarks of the Microsoft Corporation, Redmond, Washington.
® GoldSim is a registered trademark of the GoldSim Technology Group LLC Corporation, Issaquah, Washington.

Since 2005, many changes to SIM input have been identified through update of the input Excel spreadsheet derived from SIM-v1. The inputs are then read in by the GoldSim file. The GoldSim implementation of SIM-v2 calculates inventory from the product of event volumes and stream densities and compositions as a function of time. The associated GoldSim input and output files are in the Processing folder "ECF-HANFORD-17-0079-r0\Processing\SIM-v2" and organized in two subfolders: SIM_Analytic_rev5 for inventory calculation and SIM_Volume_rev5 for volume calculations.

The post-processing of the SIM-v2 results are undertaken for decay correcting the radionuclide inventory to discharge times and providing the inventory mean and standard deviation.

3 Methodology

SIM updates are briefly described and enumerated in this section with reference to related sections and appendices where more details are presented. The most important updates are described in Appendixes A through D. Appendix A details updating the uncertainty distributions for radionuclides in modeled waste streams. Appendix B outlines the approach for updating the tank leak inventory and estimating associated uncertainty. Appendix C describes the rerouting of waste streams for updating the inventory in the Z Area. Appendix D describes the radiological decay calculations needed for decay correcting (regrowing) the calculated inventory from January 1, 2001 (calculated common date) to actual discharge times at various waste sites. The remaining appendixes provide information regarding discharge sites and definitions of the spreadsheet tools used for updating/checking SIM-v2 inputs/results.

The following list summarizes key changes made in SIM-v2 (from SIM-v1):

1. SIM-v1 used a Monte Carlo sampling-based methodology (via Crystal Ball) to propagate uncertainties while SIM-v2 propagates uncertainties analytically using a statistical approach thereby significantly reducing the computational demand. The analytic approach applied in SIM-v2 results in better definition of inventory uncertainty for all analytes without worrying about the adequate number of realizations as required in the Monte Carlo-based sampling approach. More details on SIM-v2 calculation methodology can be found in CP-59798.

2. Radionuclide uncertainties in SIM-v2 are now based on their variability in concentration and not their variability in number of batches. Section 3.1.1 and Appendix A describe these variabilities in greater detail.

3. The SIM-v1 did not propagate uncertainty in tank leak volumes and did not account for waste stream composition adjustments due to loss of water (concentration factors). Details are presented in Appendix B. Uncertainty in tank leak inventory is propagated based on information presented in updated tank farm leak assessment reports. Some tank leaks that were considered in SIM-v1 are now set to zero for tanks that have been determined to be sound.

4. Included new unplanned release sites from updated waste management area (WMA) C leak inventory assessments.

5. Many Z area waste site inventory estimates were updated based on re-evaluation of waste stream compositions. These are described in detail in Appendix C.

6. Explicit inclusion of hydroxide from ion balance is now considered based on ion-balanced Hanford-defined waste model (HDW) compositions. SIM-v1 did not include hydroxide (OH^-) inventory; however, the HDW model estimated OH^-. See Appendix E for more details.

7. Radionuclide decay and regrowth calculations were introduced to estimate discharged inventories at the time of discharge (rather than presenting it for common date of January 1, 2001). Section 3.5 and Appendix D describe the approach for radionuclide regrowth and decay.

8. Solids fraction has been removed from SIM waste stream definitions because inclusion of solids is not possible without detailed solubility and sedimentation models. Also, solids in the waste stream compositions in HDW model were meant to estimate solid phases in the tanks and would not be relevant for release events such as leaks and overfills due to likely solids separation/retention in the tanks.

The above enumerated updates except number #7 were implemented in a supporting Excel workbook "SIMrev2.xlsx" (Appendix E). The workbook was used to implement and check the input updates by comparing it to SIM-v1 input as a baseline. In addition to SIM-v2 implementation, the additional pre- and post-processing tools were applied in this environmental calculation and documented in the associated folders on the Environmental Model Management Archive (EMMA).

Preprocessing was meant to update input volumes and concentrations using two Excel workbooks (Appendix E): the "SIMrev2.xlsx" combines SIM-v1 workbooks into one baseline for volume concentration and total inventory checking and "SMMbyQtrsSIMe.xlsx" represents the quarterly supernatant volume results (EMDT-IN-0025) used to estimate composition of tank leaks. The supernatant volumes are derived from the Waste Status and Transaction Record Summary (WSTRS) component of the HDW. Note that the HDW Rev. 5 did not modify or update any WSTRS information. The following subsections along with supporting appendixes provide details on key updates made in SIM-v2.

3.1 Waste Stream Composition and Radionuclide Distributions

It is a challenge to quantify the uncertainties in concentrations for each SIMwaste species. The SIM-v2 derives SIMwaste uncertainties differently than SIM-v1.

3.1.1 Uncertainty of Waste Stream Compositions

The SIM-v2 derives radionuclide concentration uncertainties from the batch-to-batch variability in inventory normalized to MTU processed in each batch as described in Appendix A. This differs from the radionuclide variabilities of SIM-v1, which is based on batch-to-batch radionuclide inventory. Thus, SIM-v1 biased radionuclide uncertainties by equally weighting small and large batches over each campaign resulting in a significant likelihood of zero Ci batches. In contrast, the SIM-v2 fit to MTU-normalized inventory per batch shows very little likelihood at zero Ci activity. Thus, the SIM-v1 radionuclide distributions did not represent the actual radionuclide uncertainties very well on a concentration basis. The likelihood of zero Ci/MTU batch is very low. There were in fact very few zero Ci/MTU batches processed because, by definition, there would have been no reason to process a batch with zero radionuclides, as there would have been no product in such a batch.

3.1.2 Distribution of Mercury, Magnesium and Replacing Ferrocyanide

Appendix C describes a transcription error for mercury that occurred in SIM-v1. The error incorrectly resulted in very large amounts of mercury in various Z Area waste sites. Essentially, SIM-v1 misread an Hg symbol for mercury from magnesium that resulted in over 757,000 kg of mercury in various Z Area waste sites whereas only about 370 kg Hg were disposed to these sites based on historical records, a factor of 2,000 less. As discussed in HNF-31792, *Characterization Information for the 216-Z-9 Crib at the Plutonium Finishing Plant*, this error was due to misreading of the discharge record mistaking $Mg(NO_3)_2$ as $Hg(NO_3)_2$ from a partially obscured copy of a notebook (Mercer, 1985, *Laboratory Notebook – Biblio 709*). The correct mercury concentration for HSW is based on the memo by Upington

(1970, "Chemical Discharges to Ground from UO_3 Plant and 234-5 Building"), which provides a chemical composition of HSW discharged to Z-18 crib in year 1969 based on the plant inventory. It indicates that 60 lbs of mercury was discharged in the 207.4 kgal of HSW. This results in mercury concentration of approximately 29 µg/g assuming a 1.03 g/cm3 density of the waste stream.

3.1.3 Correcting for Solids Partitioning and Phase Separation

Because there is no mechanistic solubility modeling undertaken based on waste stream composition, SIM-v2 does not have solid phases as part of SIM-v2 inventory and all estimates assume liquid discharges to Hanford soil sites. Additionally, in SIM-v1 there were very few waste streams with solids fraction and so this neglect does not affect SIM-v2 since the solids composition of waste streams originated from HDW to estimate solid phases in waste storage tanks. The HDW solubility model partitioned chemicals and radionuclides into solution, sludge, and saltcake phases to represent the actual solids sedimentation within the tanks. Although SIM-v2 uses some HDW waste stream information for tank liquids, these uses do not include the HDW solubility model beyond defining those tank liquids. As there is no solubility model in SIM-v2 beyond what is embedded in the HDW model, there is no partitioning of solids for any SIM-v2 wastes.

Within SIM-v2, there are only limited ad hoc retention and propagation assumptions. For example, the Z Area waste stream definitions include both soluble and insoluble species, but SIM-v2 does not use a solubility model to separate those species. The Waste Information Data System (WIDS) reported 39 MT of uranium for SIMsite 216-A-19 and SIM-v1 included entrained solids to represent that inventory. The WIDS total uranium corresponds to the 13 Ci of total uranium reported for the 216-A-19 site in (SGW-60540). In the miscellaneous section page 155 of the (SGW-60540), it was highlighted that the site was exceeding both uranium and nitrate limits of ecological wild life and ground water protection. This indicates the likely discharge of uranium in the uranyl nitrate species that is more soluble compared to the uranyl carbonate species that was used as the basis of estimating waste stream composition and solids portions. Thus, SIM-v2 handles soluble and assumed solids portions of liquid discharges through separate runs to allow the speciation of the solids portion. This report discusses the run for the soluble portion that would pass through the vadose zone to ground water pathway. A future run for the solids portions will be reported separately with further analysis of solids portions through speciation and solubility release modeling.

Therefore, the current SIM-v2 run/calculation considered liquid inventory after possible upstream separation of solids in storage tanks or in the settling tanks associated with some SIMsite cribs. The Z Area tanks 241-Z-361 and 241-Z-8 both hold sludge sediments from waste liquids that overflowed into cribs downstream. The retention and propagation of liquids and solids from open trenches that flowed into the U-10 pond are subject to simple partitioning assumptions adopted from SIM-v1, and those assumptions have not been validated by any sedimentation or transport model.

SIM-v2 does not account for the various past and ongoing campaigns to remove and/or encapsulate contaminants of potential concern from selected Z Area SIMsites. Among these are a Z-9 soil mining operation in 1976, a 450 MT soil vitrification of Z-12 in 1987 and a CCl_4 vapor stripping operation that started in 1996. However, SIM-v2 adjusted the CCl4 by partitioning in waste streams and compartments in the Z area sites as detailed in Appendix C.

3.2 Dilution/Concentration

The supernatant mixing model (SMM) quarterly results of tank inventories in "SMMbyQtrsSIMe.xlsx" were output of the HDW model. The HDW assumes single point solubility, ideal mixing of waste supernatants, sedimentation of solids into tank sludge layers, and accounting for water addition (dilution)

or evaporation (concentration) generates an SMM vector for waste supernantants. It is then the SMM vector at the time of a tank leak that determines that the waste composition and hence released inventory.

In SIM-v1, there was a very pervasive dilution/concentration error in many SIMsite inventories since SIM-v1 did not account for either tank dilution or concentration (supVol/smmVol of HDW model). The SIM-v1 ignored HDW concentration factors and did not carry HDW water (as WTR) in the SMM vector. Because this error is obvious by simple mass balance of leaks and crib inventories, SIM-v2 now includes HDW WTR in its volume input estimated from HDW's SMM vectors.

3.3 Z Area SIMwastes and SIMsites

Operations over the history of the Z Area (HNF-EP-0924, *History and Stabilization of the Plutonium Finishing Plant (PFP) Complex, Hanford Site*) produced plutonium metal "buttons" from a variety of sources. A previous conceptual model CHPRC-01192-A, *Conceptual Model for Hanford 242-Z Area Soil Disposal Sites and the Hanford Soil Inventory Model (SIM) – 11565*, recommended necessary updates to SIM Z Area SIMsites (Appendix C). Primary Pu sources were solutions from each extraction facilities at Hanford. Secondary Pu was recycled or recovered from scrap and other wastes from the metal button processes. The conceptual model study demonstrated distribution of 23 SIMwaste variations to Z Area SIMsites as cribs, French drains, closed trenches, open trenches, and settling tanks.

3.4 Tank Leaks

Tank leak volumes have been updated for various tank farms. The SIM-v1 did not report any tank leak volume uncertainties although the leak estimates were still subject to uncertainties in composition.

The SIM-v2 assigns most leak volume uncertainties to a beta distribution that results in a relative standard deviation (RSD = standard deviation (sd)/mean) of +/-50%, except where the leak assessment reports showed bounding tank leak ranges. The beta probability density function (pdf) is flexible at representing the rather large uncertainties often assigned to leaks. shows the generic pdf beta that represents leak volume uncertainties with a = b = 1.5, rsd = +/-50%, except where the leak assessment reported bounds. Also shown with same mean are triangular and lognormal pdfs. The beta pdf adapts very well to the many different ranges of minimum, most likely, and maximum reported for leak volume uncertainties.

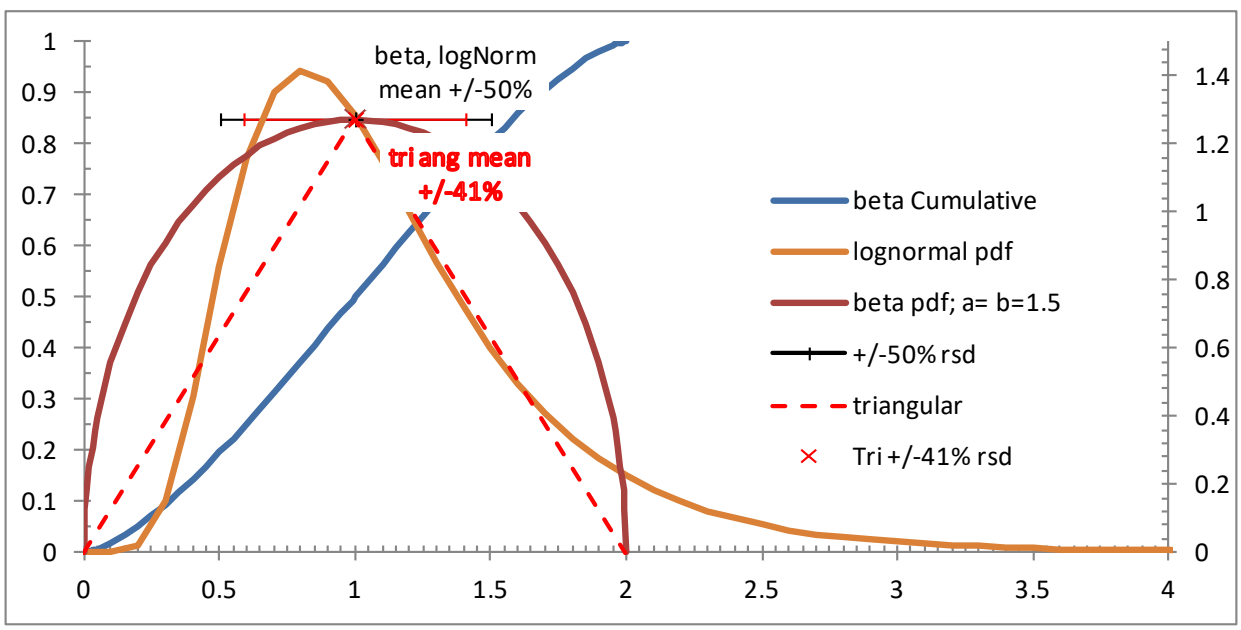

Figure 1. Generic PDF Representing All Leak Uncertainties

There can be rather dramatic changes in tank inventory between quarters as shown in Appendix B and even within a quarter and therefore this uncertainty leads to an uncertainty of the leak inventory as well. However, SIM-v2 uses leak dates and uncertainties from various tank leak assessment reports. Appendix B describes the general approach for applying uncertainty distributions to specific tank leaks.

3.5 Decay/Regrow (Back Decay)

The ORIGEN2 and DKPRO decayed all radionuclides to January 1, 2001, but transport calculations need radionuclide activities for each SIMsite at the times for each release event. Therefore, SIM-v2 output was post processed to regrow the radionuclide activities to the year of release for each SIMsite release over the period 1944-2000.

Radionuclide decay and regrowth equations are based on the following analytical derivation. The decay and regrow procedures were implemented in MATLAB® (Appendix D).

For radioactive parent element E_1 decaying to radioactive daughter element E_2, denote the decay rates

λ_1 = decay rate of element 1 [1/time],

λ_2 = decay rate of element 2 [1/time],

and corresponding ½-lifes [time]

$$t_{1/2}^1 = \frac{\ln(2)}{\lambda_1},$$

$$t_{1/2}^2 = \frac{\ln(2)}{\lambda_2}.$$

The differential equations modeling 2nd order decay with ingrowth to decaying daughter is

$$\frac{dN_1}{dt} = -\lambda_1 N_1, \qquad \text{Eq. 1}$$

$$\frac{dN_2}{dt} = -\lambda_2 N_2 + \lambda_1 N_1, \qquad \text{Eq. 2}$$

where

N_1 = number of radioactive nuclei of element E_1,

N_2 = number of radioactive nuclei of element E_2.

Assume the solutions have initial conditions at time t_0

$$N_1(t_0) = N_1^0,$$

$$N_2(t_0) = N_2^0.$$

The solution is required at time $t = t_0 + \Delta t$ with time change $t - t_0 = \Delta t$. Eq. 1 is separable with solution

$$N_1(t) = N_1^0 \exp(-\lambda_1 \Delta t). \qquad \text{Eq. 3}$$

The differential Eq. 2 is written

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$$\frac{dN_2}{dt} = -\lambda_2 N_2 + \lambda_1 N_1^0 \exp(-\lambda_1 \Delta t)\,, \qquad \text{Eq. 4}$$

which is first order linear. The solution can be expressed as a variational function multiplied by the homogeneous solution

$$N_2(t) = v(t)\exp(-\lambda_2 \Delta t)\,. \qquad \text{Eq. 5}$$

Setting the derivative of right-hand side of Eq. 5 equal the right-hand side of Eq. 4 yields

$$\frac{dv}{dt} = \lambda_1 N_1^0 \exp((\lambda_2 - \lambda_1)\Delta t)\,.$$

Integration yields

$$v(t) = \frac{\lambda_1 N_1^0}{\lambda_2 - \lambda_1} e^{(\lambda_2 - \lambda_1)t} + C\,.$$

The arbitrary constant can be determined from the initial condition $N_2(0) = N_2^0$, which yields

$$C = N_2^0 - \frac{\lambda_1 N_1^0}{\lambda_2 - \lambda_1}\,.$$

From Eq. 5

$$N_2(t) = \frac{\lambda_1 N_1^0}{\lambda_2 - \lambda_1}\left[\exp(-\lambda_1 \Delta t) - \exp(-\lambda_2 \Delta t)\right] + N_2^0 \exp(-\lambda_2 \Delta t)\,. \qquad \text{Eq. 6}$$

The activity of an element is $A = \lambda N$, which is the number of disintegrations per unit time. The solutions to the decay equations, Eq. 1 and Eq. 2, can be expressed in terms of activity by multiplication of Eq. 3 by λ_1 and multiplication of Eq. 6 by λ_2, which yields the **decay equations**

$$A_1(t) = A_1^0 \exp(-\lambda_1 \Delta t)\,, \qquad \text{Eq. 7}$$

$$A_2(t) = \frac{\lambda_2 A_1^0}{\lambda_2 - \lambda_1}\left[\exp(-\lambda_1 \Delta t) - \exp(-\lambda_2 \Delta t)\right] + A_2^0 \exp(-\lambda_2 \Delta t)\,, \qquad \text{Eq. 8}$$

where A_1^0 and A_2^0 are the initial activities at time t_0.

To regrow the nuclides, use Eqs. 7 and 8 for second order decay with initial time t and regrow to end time t_0. Then $\Delta t = t_0 - t$ is negative and the activities A_1^0, A_2^0 are interchanged with $A_1(t), A_2(t)$, respectively. For 1st order decay only Eq. 7 is required.

The case of **secular equilibrium** is, $\lambda_2 >> \lambda_1$. For secular equilibrium the decay and regrow of the daughter is, respectively,

$$A_2(t) = A_2^0 \exp(-\lambda_1 \Delta t) \text{ and } A_2^0 = A_2(t)\exp(\lambda_1 \Delta t) \qquad \text{Eq. 9}$$

Equations 7, 8, and 9 will be the basis of the decay/regrow model described in the software application in Appendix D.

The following radionuclides were screened after decay and ingrowth of the 46 nuclides that are commonly listed for Hanford. The screening was only to reduce the number of radionuclides as per the needs of the CA (CP-60195-r0_TAD):

H-3	Nb-93m	Pa-231

C-14	Tc-99	Th-232
Co-60	Sn-126	U-232, -233, -234, -235, -236, and -238
Se-79	I-129	Np-237
Sr-90	Cs-137	Pu-238, -239, -240, -241, and -242
Zr-93	Eu-152, -154, and -155	Am-241 and -243

In addition, the following isotopes are not tracked in SIM-v2; they are initialized to 0.0 activity until identified by other possible sources:

Cl-36, Po-209, K-40, and Re-187

While these radionuclides were listed as COPC in prior studies, their inclusion in the screened inventory could be ignored. For instance, the total discharged inventory of K-40 is 12.3 Ci while total potassium is 1.5e7 kg. Converting K-40 into mass units (specific activity = 6.99E-6 Ci/g) and taking the ratio to total potassium results in 0.0117% abundance. This value is same as natural abundance of K-40, thereby indicating that almost all of the K-40 inventory is natural. The Cl-36 comes with the reactor graphite cores that are reported separately with the solids inventory.

4 Assumptions and Inputs

This chapter lists inputs and assumptions that were not implemented explicitly in SIM-v2. The indicated Excel workbooks and references were used to prepare SIM-v2 input. Decay chains and half-lives were used to regrow the SIM-v2 results. Backward simulation to regrow radionuclides is not possible in GoldSim and SIM-v2 implementation; therefore, regrow calculation were done externally to the SIM-v2 results and both MatLab calculations and output stored in excel will be used with the inventory update.

4.1 Release Volumes, SIMsites, and SIMwastes

About 6,300 volumes come from SIM-v1 and updated in SIMrev2.xlsx workbook described in Appendix E. The SIMsites in Appendix G and SIMwastes in Appendix H also come from SIM-v1 with the changes noted in Section 3.1. SIM-v1 inputs were therefore primarily used as SIM-v2 input after implemented updates using the SIMrev2 workbook

4.2 Quarterly HDW Output

Appendix E describes the worksheets of the SMMbyQtrsSIM workbook and represents the quarterly inventories of all tanks from 1944 to 1996. The SMMbyQtrsSIM was used to assign the compositions of all tank leaks based on their release event dates.

4.3 Hydroxide Calculation and pH

Appendix E describes the hydroxide estimate from ion balance as it was implemented in HDW-rev4 and SIM-v2 now have a pH expressed as ppm OH^-. The SIM-v2 hydroxide calculation also does not include any buffering by PO_4^{3-}, CO_3^{2-}, $Al(OH)_4$, or other ions, either.

4.4 Decay Chains

About half of the SIM reported radionuclides decay to stable radionuclides and can be presented with first order decay while the other half represent radionuclides that also have ingrowth from parents as well while undergoing decay. Appendix D shows the four major decay chains for SIM-v2 radionuclides. The decay chains were simplified and presented using second order decay. The SIM-v2 inventory results were regrown (back decayed) using the simplified second order decay.

4.5 Operable Units

The SIM-v2 uses site groupings according to the current WIDS classification for operable units (OPUs) and WMAs that group tank farms release events. The site groups have changed over time to reflect process-based sources, similarities between contaminant sources and management areas. More detailed SIMsite descriptions with associated OPUs are listed in Appendix G. Appendix H lists waste streams flowed to these sites. Appendix I shows the OPUs and WMAs in SIM-v2 with their common features and associated sites.

4.6 Radionuclide Half-Lives

The radionuclide half-lives listed in Appendix D are from the ICRP database and publication number 107 (ICRP, *Nuclear Decay Data for Dosimetric Calculations*). The ICRP half-lives provide a much more defensible basis for decay/regrow calculations adjusting SIM-v2 output compared with other references as documented in (EMDT-DE-0006,"Half-Lives for Typical Hanford Site Radioactive Contaminants").

5 Software

This chapter explains the software used to implement the SIM-v2 model and the decay correction algorithm. Software was used consistent with requirements of a CHPRC controlled software management procedure that implements the requirements of DOE O 414.1D, *Quality Assurance*.

5.1 GoldSim

GoldSim was the selected primary software to implement the SIM model. GoldSim is approved for use at the Hanford Site and is graded Level C software. GoldSim use at Hanford for this class of problems is managed under the following software quality assurance documents:

- CHPRC-00180, *GoldSim Pro Functional Requirements Document*
- CHPRC-00175, *GoldSim Pro Software Management Plan*
- CHPRC-00224, *GoldSim Pro Software Test Plan*
- CHPRC-00262, *GoldSim Pro Acceptance Test Report: Version 11.1.5*
- CHPRC-00256, *GoldSim Pro Requirements Traceability Matrix: Version 11.1.5*

5.1.1 Description

The following required information is provided for the software package used in the calculation:

- Software Title: GoldSim Pro
- Software Version: 11.1.5
- HISI Identification Number: 2461

- Workstation type and property number (from which software is run): INTERA-00799

5.1.2 Software Installation and Checkout

A copy of the Software Installation and Checkout form for the workstation used is provided in Appendix K to this ECF.

5.1.3 Statement of Valid Software Application

The use of GoldSim for implementation of the SIM-v2 is an appropriate application of this software, consistent with the functional requirements and within its limitations as defined in CHPRC-00180.

5.2 MATLAB

The regrowth/decay program calculation described in Appendix D was written in M, a programming language for MATLAB® and its Integrated Development Environment (IDE). The regrowth/decay program contains the components described in the following sections. MATLAB is graded Level D software.

5.2.1 Description

The following required information is provided for the software package used in the calculation:

- Software Title: MATLAB
- Software Version: v2018b
- HISI Identification Number: 4060
- Workstation type and property number (from which software is run): INTERA-00799

5.2.2 Software Installation and Checkout

As Level D software, formal installation and checkout is not required.

5.2.3 Statement of Valid Software Application

The use of MATLAB is appropriate application the regrowth/decay calculation, and its use was checked as part of the checking of this ECF.

5.2.4 Additional MATLAB Application Details

5.2.4.1 MATLAB Inventory Class Object

The inventory is a class object in MATLAB that facilitates the radionuclide regrowth and decay calculations. Each SIMsite is a data object with defined properties within the inventory class and the class definitions are listed in Appendix D.

5.2.4.2 MATLAB ReadSimOPU for Reading SIM-v2 Results

The function ReadSimOPU reads both inventory and volume worksheets from SIM-v2 output Excel files for each operable unit. The function then builds the numerous output spread sheets in one data structure for each operable unit as listed in Appendix D.

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5.2.4.3 MATLAB Decay-Regrow M-Function

The decay procedure described in Section 3.5 was implemented in MATLAB after the Excel implementation and validation (EMDT-DE-0006). The same half-life constants and procedure was implemented as a function in MATLAB where it can be repeated by calling the regrow calculation to regrow or decay inventory activity to the discharge year. Appendix D lists the M-function.

5.2.4.4 Writing Regrown/Decayed and Adjusted Inventory

Appendix D describes the M-function that regrows the radionuclide inventory to the discharge date for each OPU. The M-function writes the results to an Excel workbook listing inventory with corresponding site IDs, active years and discharged volume to provide the necessary inventory output for vadose zone source terms. The output workbook has a worksheet for means and another for standard deviation. The M-function also writes the results into Excel files to a corresponding OPU/WMA output file.

6 Calculation

The SIM-v2 calculation of inventories for 400 SIMsite results from the product of 213 SIMwaste compositions with about 6,300 release events to Hanford SIMsites from 1945 through 2001. The detailed description of the analytical solution of SIM-v2 and its implementation are provided in CP-59798. As per the calculation methodology described in the MPR, the inventory uncertainty is represented by lognormal distribution defined by the true mean and standard deviation.

The SIM_volume.gsm was developed to replicate SIM-v2 but calculates only the discharged volume statistics. The GoldSim SIM-v2 using the updated input file gives the SIMsite inventories and the batch file “GS_SIM_Batch.bat” then binds those results into the 28 OPU Excel files. Another batch file runs SIM-Volume-v2 and stores the results in 28 operable unit output Excel files for inventory results, a total of 56 output files.

The script in Appendix D reports the 2001 decayed inventory as well as another output set of inventories regrown to release years. Also, the post processed output was arranged in separate files for each operable unit and in two other spread sheet files presenting all liquid discharge inventory means and standard deviations as provided in the post-processing results. The total inventory for the 46 radionuclides evaluated by SIM summed for each SIM site is tabulated in Appendix J.

7 Results and Discussions

Along with comparisons with SIM-v1, the discussion of SIM-v2 results in this chapter focuses on the volumes and selected radionuclides U-238, Pu-239, Cs-137, I-129, Tc-99, and Sr-90. Also included is the low risk H-3 because there is such a large history of H-3 measurements in groundwater.

The approach for discussing the results relies on three graphical tools. Pie charts are used to present sites and OPUs that received most of the inventoried radionuclides. Maps present the total mean inventory next to the mapped locations of the highest inventory sites of the studied radionuclide. Each radionuclide map also presents the detected groundwater plumes for comparison. Scatter plots are used to compare SIM-v1 and SIM-v2 for 25 OPUs for the main risk drivers. The changes in SIM-v2 relative to SIM-v1 for these main risk driver radionuclides are the result of one or more of the changes listed and described in the methodology section for updating SIM-v2 input The tank leaks updated according to Section 3.4 and Appendix B are the greatest source of differences comparing SIM-v1 to SIM-v2. There were many significant changes in the uncertainties according to Appendix A. The balance of the other changes did not significantly impact high risk radionuclide means.

7.1 Release Volumes

The three largest release volume SIMsites received 80% of the 860 GL (Giga Liter) of SIM-v2 total volume releases—these are 216-A-25 (34%), 216-B-3 (33%), and 216-U-10 (14%), all within OPU 200-CW-1 as shown in Figure 2. The site 216-A-25 is the Gable Mountain pond that received about one third of the discharges that present non-contact or less contaminated process waste over its operating lifetime (1958-1985). The pond site 216-B-3 received through a longer operating lifetime (1945-1996) over 282,000 ML of diluted discharges from bismuth phosphate process and cooling water from the B and PUREX plants. Figure 3 shows map of high discharge locations along with the release volumes in ML. Both ponds were located on the northeast of the 200 East Area. The next largest flows were received at the 216-U-10 pond, 216-T-4A and 216-S-16P in the 200 West Area. The total volumes to the west ponds were about 24% of the Hanford Site and occurred over a relatively shorter period compared to the East Area.

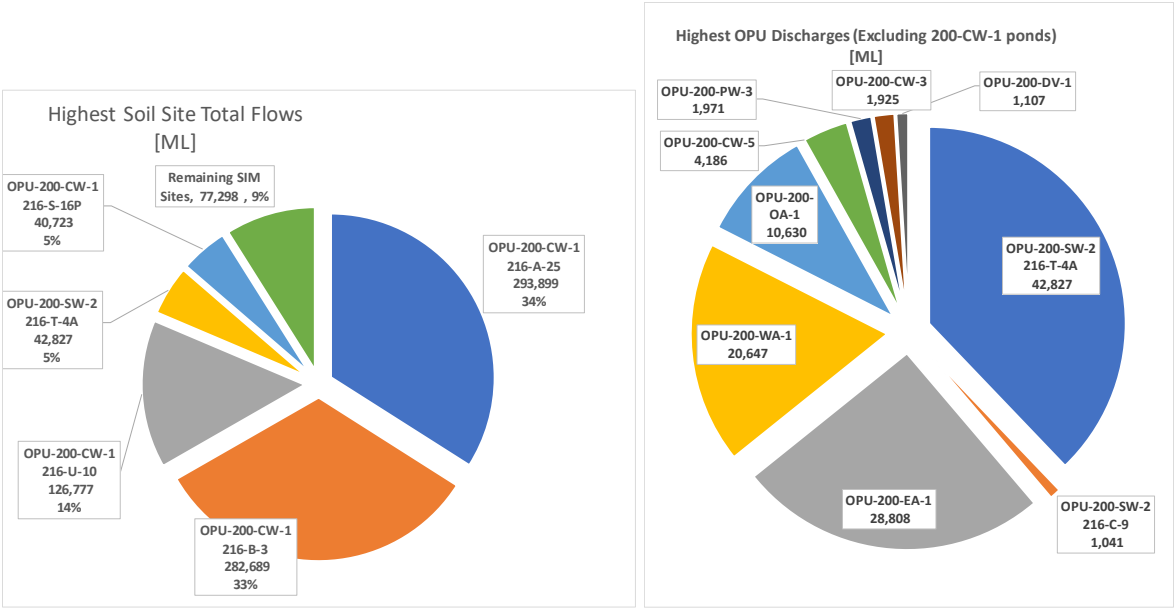

Figure 2. SIMsites Release Volumes

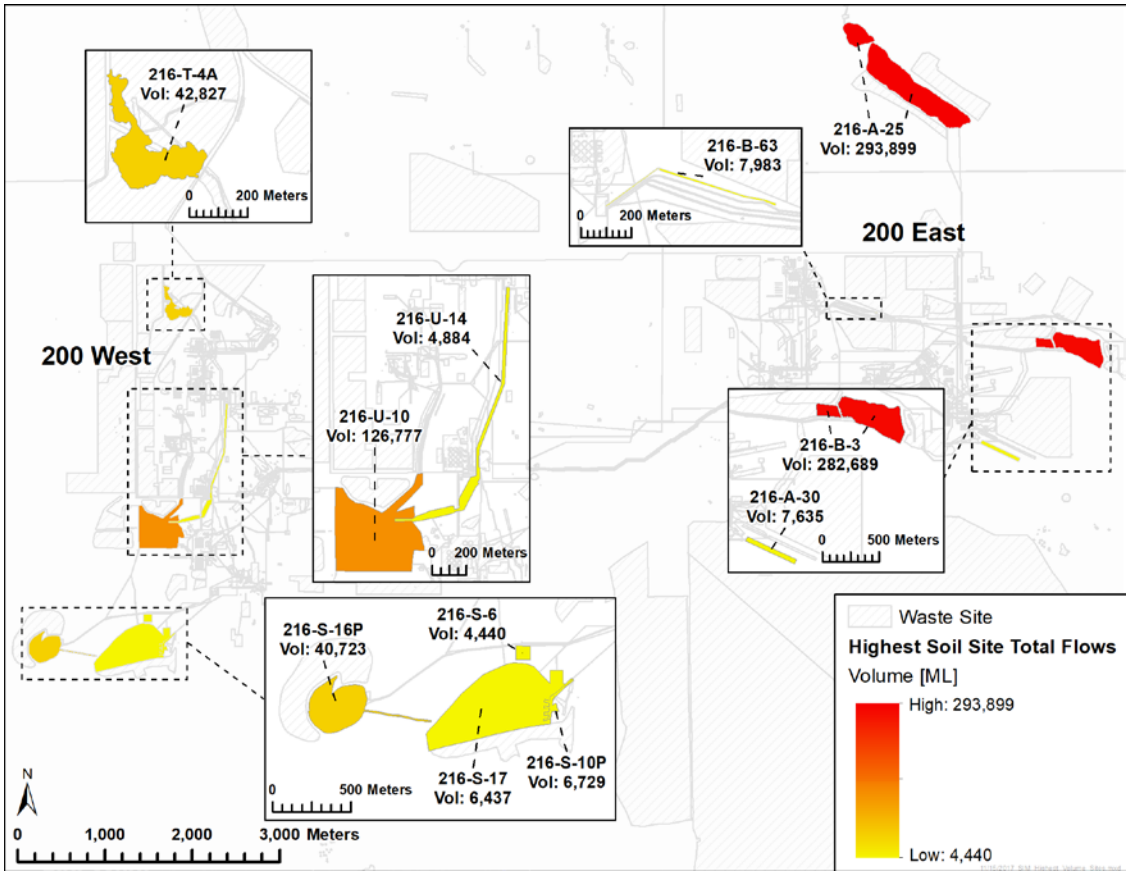

Figure 3. Locations and Amounts of Highest Release Volumes Across the 200 Areas

7.2 Radionuclide Inventories

The Figure 4 scatter plot compares SIM-v2 with SIMv1 considering the total radionuclide activity tracked in SIM. Comparisons are projected around the equivalence line of SIM-v2 to SIM-v1 for OPUs and WMAs. All OPUs cumulative site total mean activities are aligned with the equivalence line, meaning that total OPU inventories are equivalent between both SIM versions. The main difference is with tank leak inventories, where volumes were updated according to tank leak reports and uncertainty were estimated for associated inventories. Uncertainty ranges were projected by the vertical error bars as the range from the 0.1 to 99.9 percentile. With exception of WMA C, all uncertainty ranges of SIM-v2 WMAs leak inventories intersect with the equivalence line, meaning that the SIM-v1 mean total activity lies within the uncertainty ranges. Three out of the seven WMAs (C, A-AX, and B-BX-BY) had SIM-v2 estimated mean inventory higher than SIM-v1 but are within one order of magnitude. Detailed of the analyzed tank leaks are discussed in Appendix B.

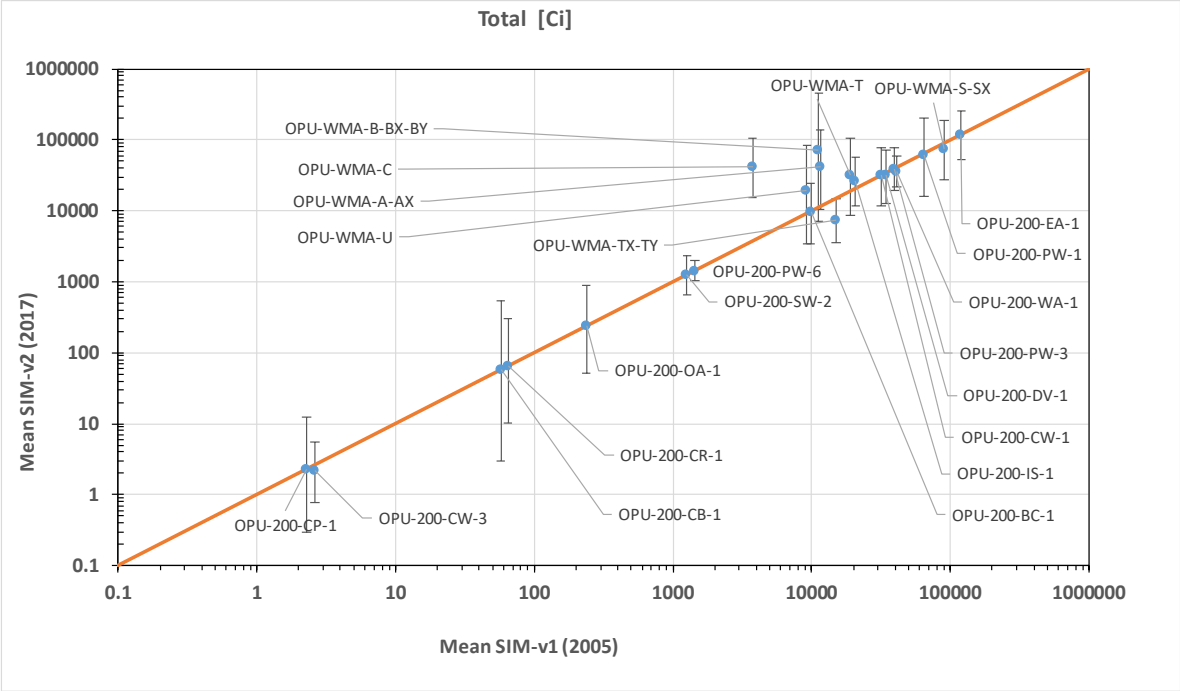

Figure 4. Total Radioactive Inventory of OPUs and WMAs Comparing SIM-v2 and SIM-v1 Estimates

The following sections detail the SIM-v2 inventories and uncertainties for Cs-137, H-3, Tc-99, I-129, Sr-90, and U-238 as well as the differences from SIM-v1 inventories. Pie charts show both total activity as well as percent of total for each radionuclide and scatterplots compare SIM-v2 and SMIv1 inventories by OPU as well as selected SIMsites. Inventory uncertainty is presented by the confidence intervals for each OPU to indicate whether changes in SIM-v2 are outside of the 1% to 99% confidence interval using the lognormal distribution of the inventory. Again, Changes from various tank leak assessments are responsible for most of the radionuclide changes in SIM-v2 and Appendix B details those changes.

7.2.1 Cs-137

The SIM-v2 Cs-137 inventory estimates for various OPUs are presented in Figure 5. They are dominated by the leaks from tanks located in various tank farms. SIM-v2 inventory for Cs-137 shows an increase of about 65% compared to SIM v1 (Figure 6). Consistent with the updates from the leak assessments detailed in Appendix B, nearly all of the WMAs show increase in radionuclide inventory as presented in the following figures. The increase is mainly due to updated input to match reported tank leak estimates of volume and Cs-137 (e.g., C-105 tank leak and C-Farm line leak UPR-200-E-81).

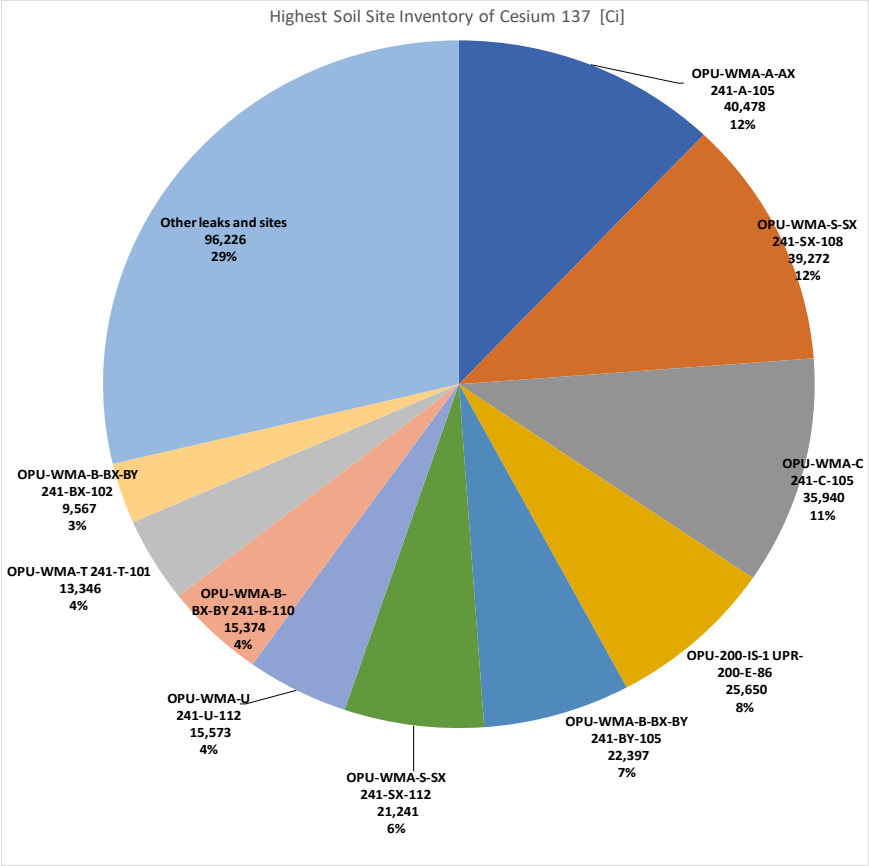

Figure 5. Cs-137 Distribution

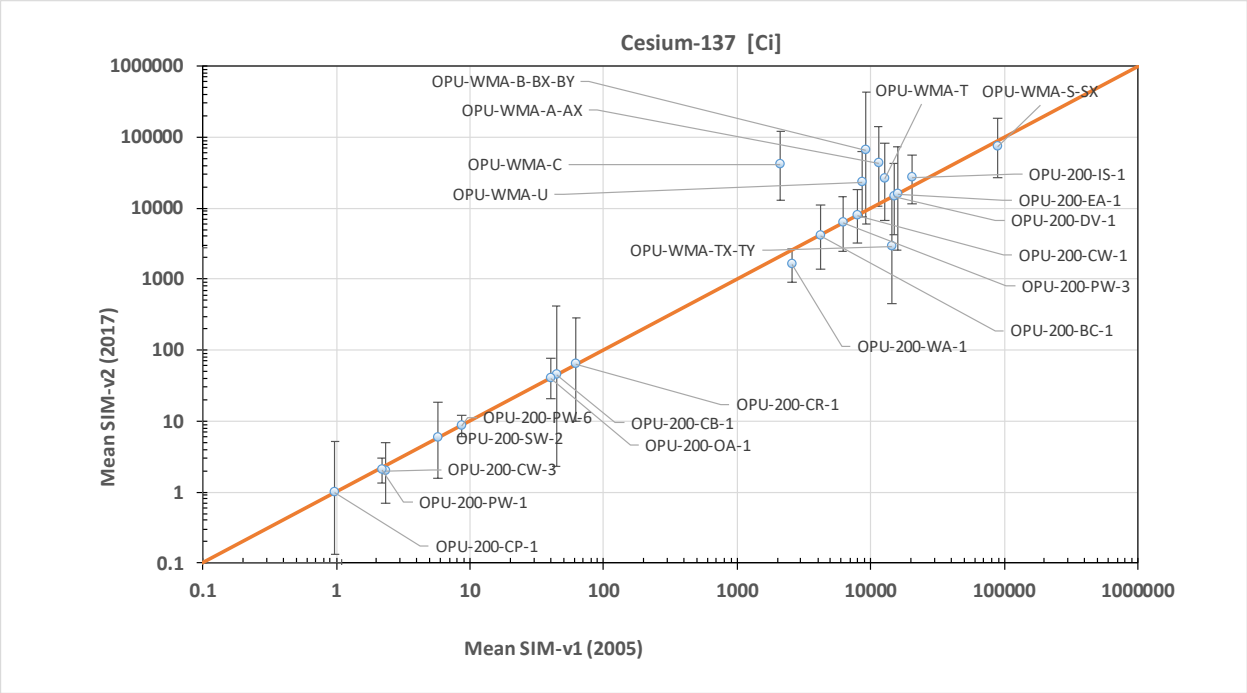

Figure 6. Cs-137 Ci SIM-v2 OPUs versus SIM-v1

Four out of the seven WMA OPUs (C, A-AX, U, and B-BX-BY) have SIM-v2 estimated inventory one order of magnitude higher than SIM-v1 estimates (Appendix B).

7.2.2 H-3

Figure 7 shows tritium inventory by OPU and by sites based on highest discharged inventory to January 1, 2001. The total H-3 inventories between SIM-v1 and SIM-v2 have changed very little, <+0.1%. Figure 8 shows how H-3 distributes across the Hanford Site OPUs, and Figure 9 shows two WMAs (B-BX-BY and T) outside of the 99% for H-3.

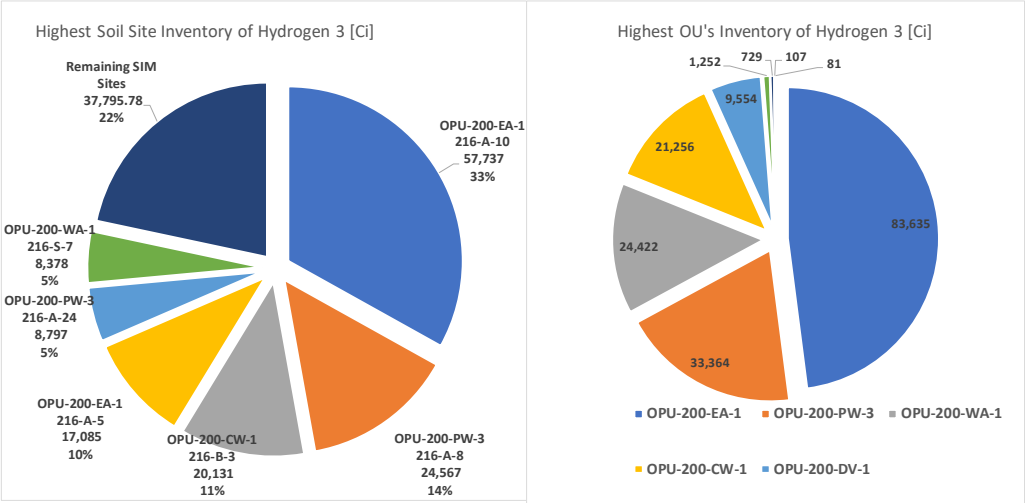

Figure 7. SIM-v2 H-3 Inventories by Select SIMsites

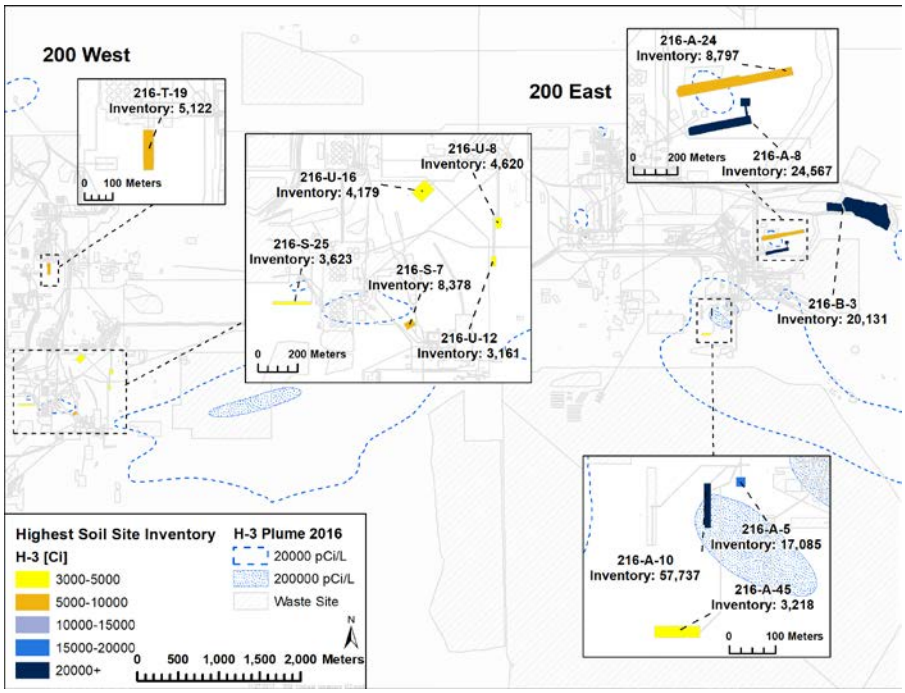

Figure 8. Locations of H-3 Highest Inventory Sites in the 200 Areas

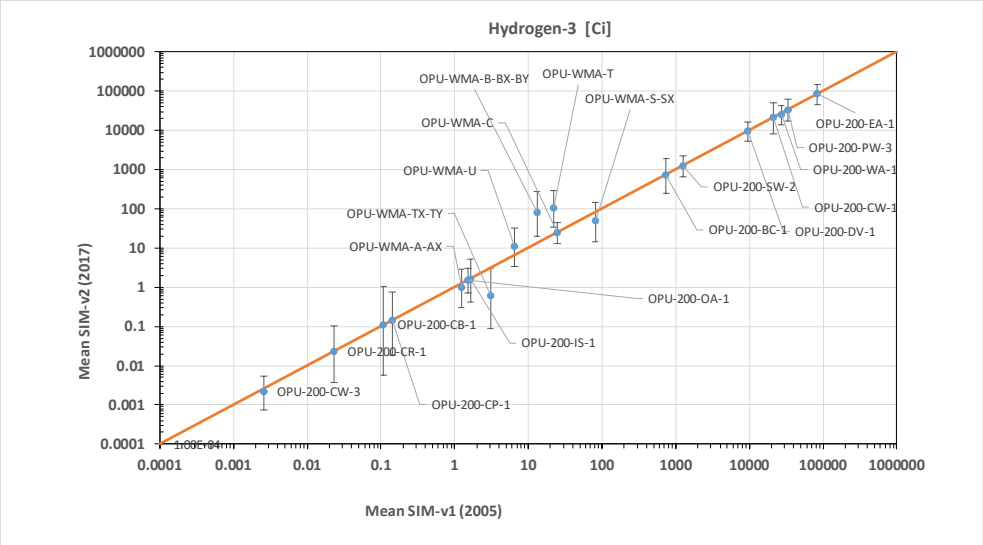

Figure 9. H-3 by OU between SIM-v2 and SIM-v1

7.2.3 Technetium 99

Figure 10 shows that 728 Ci inventory of Tc-99 in SIM-v2 is distributed among many SIMsites, but 86% is in just four OPUs and 54% in 200-BC-1 OU. The SIM-v2 increased by 5% over SIM-v1 due to the updated tank leak assessments for WMAs B-BX-BY and C, Appendix B. Not only were there changes in leak inventories, but there were also a few new tank leaks in SIM-v2 that were not in SIM-v1.

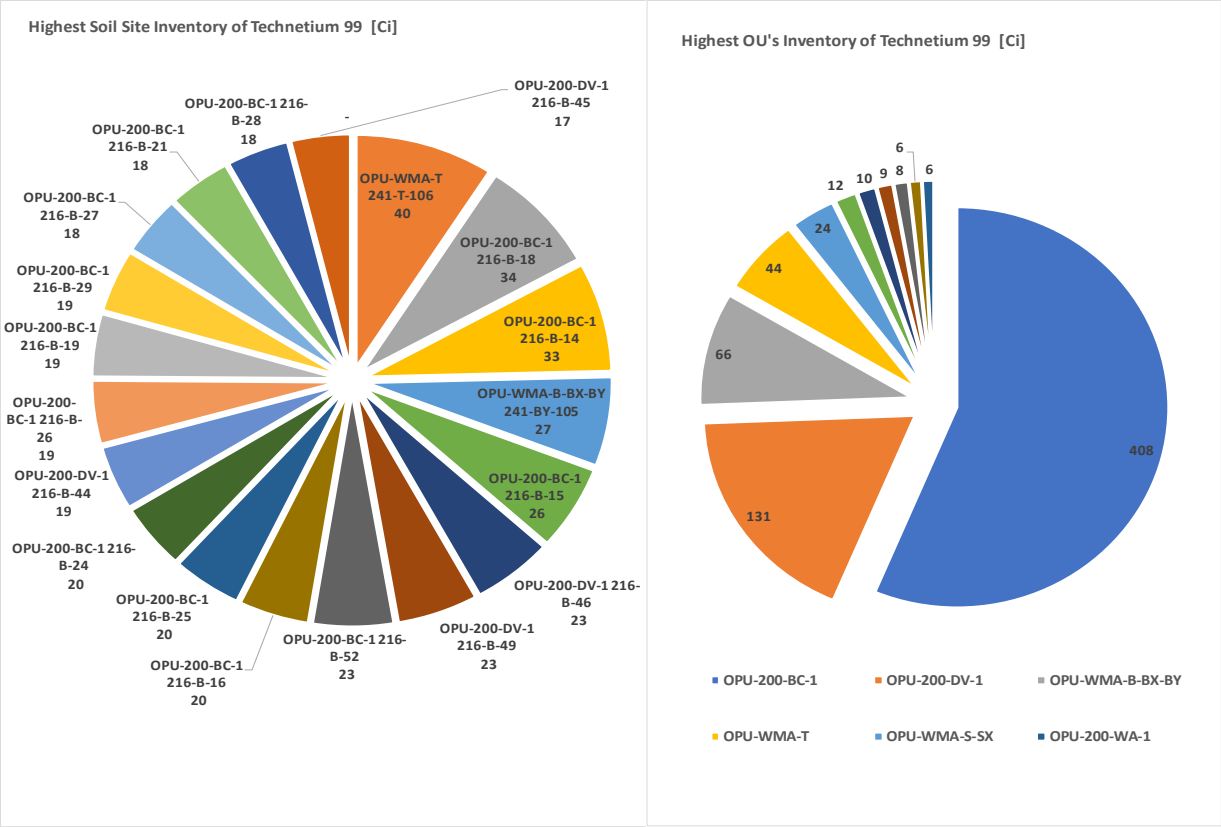

Figure 10. SIM-v2 Tc-99 Inventories by Highest Sites and OPU's.

Figure 11 shows the locations for SIM-v2 Tc-99 where most Tc-99 releases were in 200-BC-1 and 200-DV-1. The Tc-99 changes in Figure 12 are mostly in WMAs B-BX-BY and C. Figure 13 shows these differences in Tc-99 for the SIMsites of WMAs B-BX-BY and C and show that tanks leaks drive these differences.

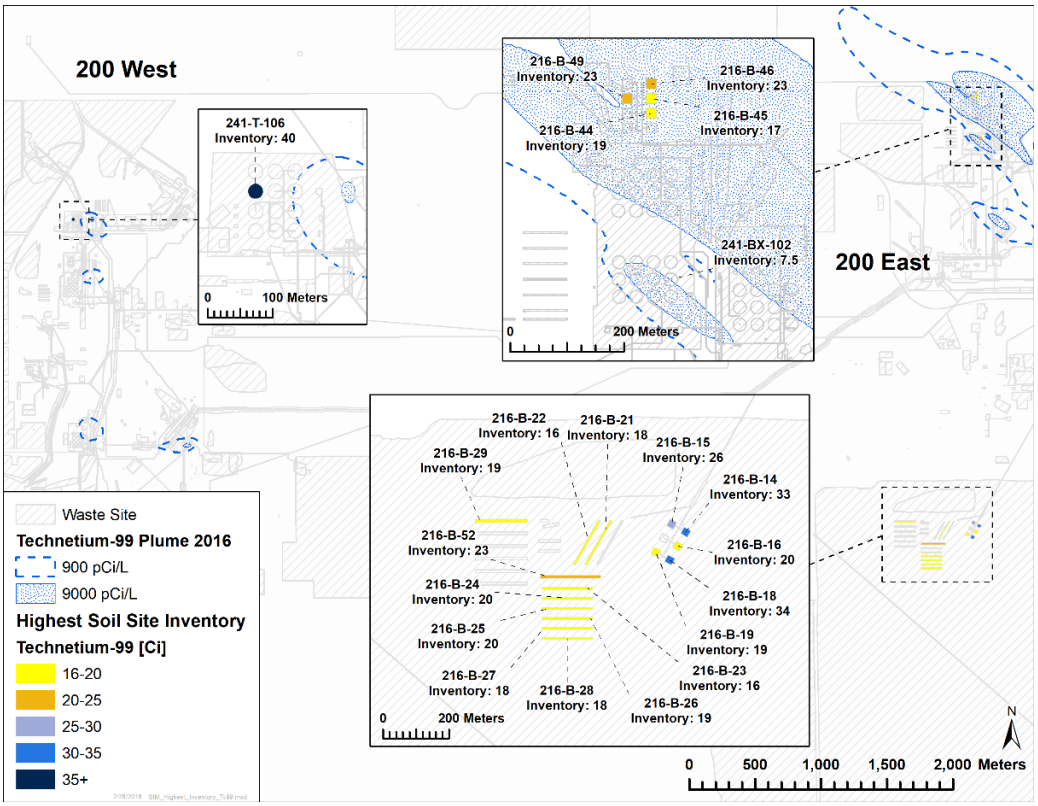

Figure 11. Site Distribution for Tc-99

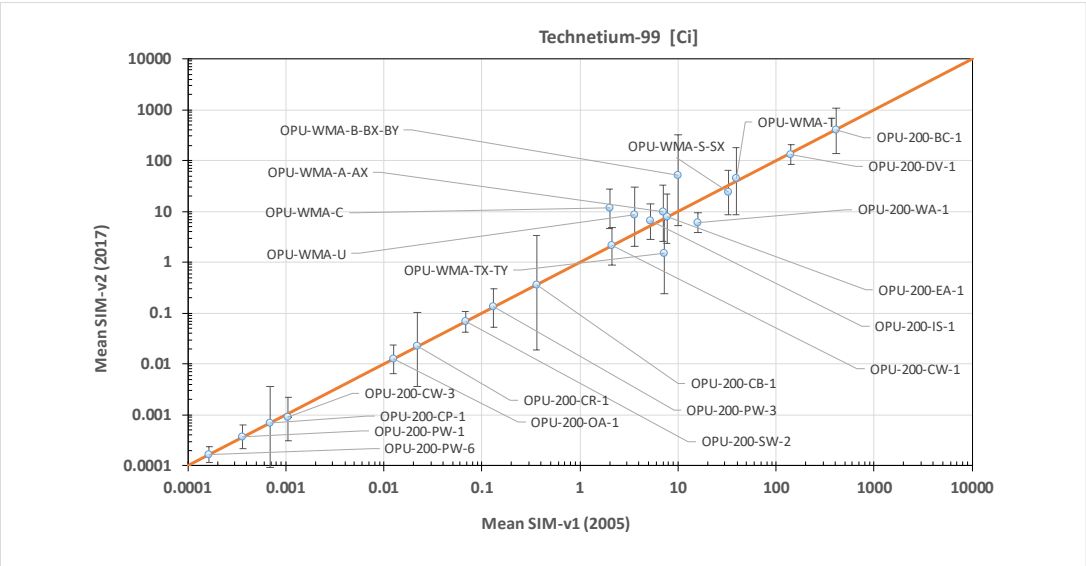

Figure 12. Tc-99 by OPU Between SIM-v2 and SIM-v1

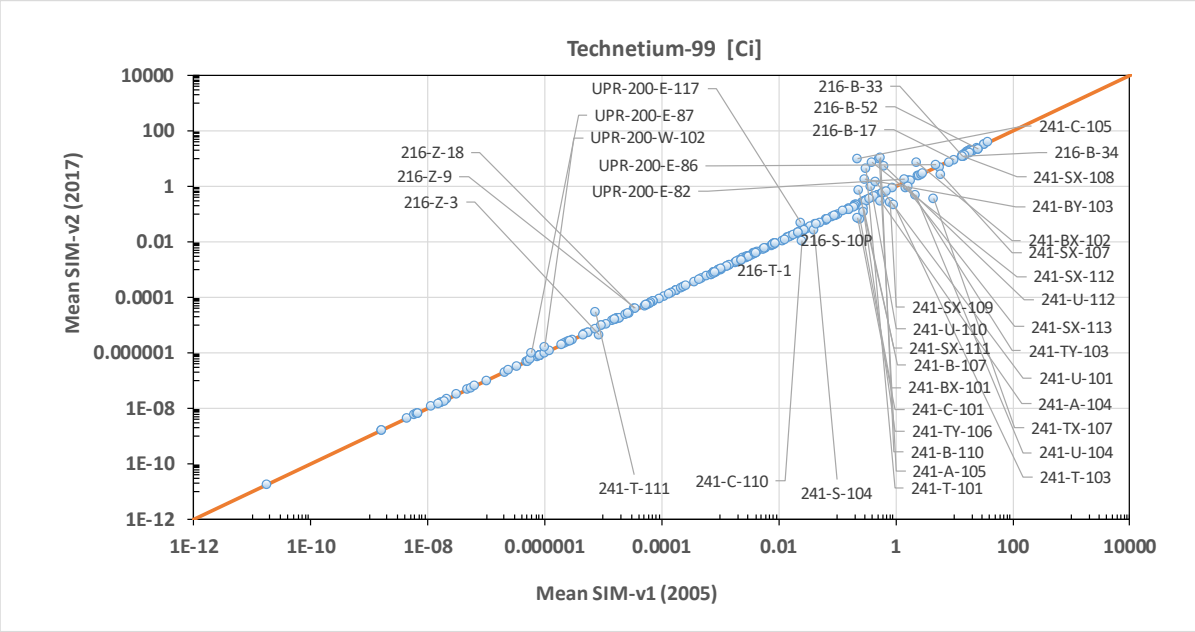

Figure 13. Tc-99 by SIMsite between SIM-v2 and SIM-v1

SIM-v2 implemented the adjustment to Tc-99 at sites 216-U-1 and 2 in a manner like that applied in SIM-v1 (RPP-26744, Appendix A4.2) leading to total Tc-99 of 7.27 Ci at this site.

7.2.4 Iodine 129

There are 4.6 Ci of I-129 in SIM-v2, which is a 1.7% increase from SIM-v1 mainly from tank leak updates. There is 58% of the I-129 in just two SIMsites as shown in Figure 14.

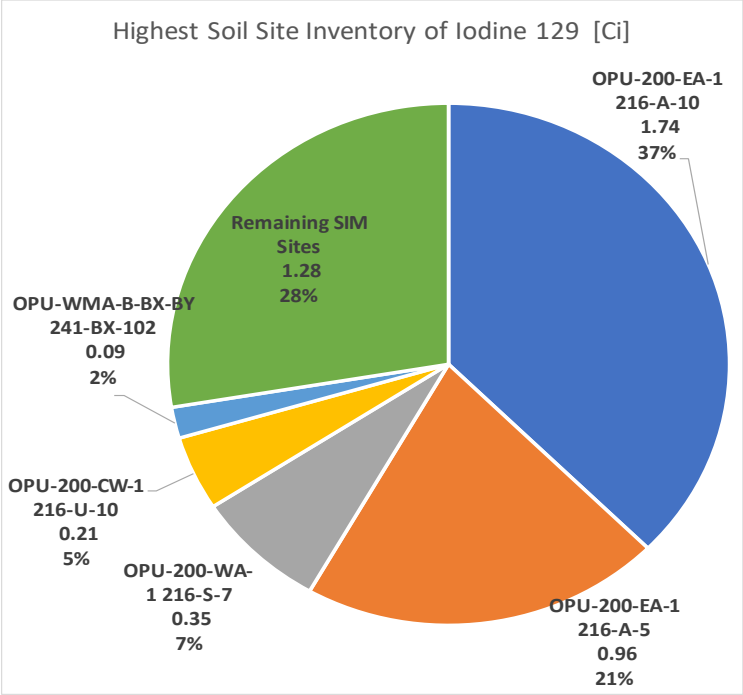

Figure 14. SIM-v2 I-129 Distribution Among Highest Inventory Sites

Figure 15 shows the distribution for I-129, which is mostly in cribs 216-A-10 and 216-A-5 in East Area and 216-S-7 and U-pond 216-U-10 in West Area, and in OU (Figure 16) and by SIMsite (Figure 17). The main source of I-129 was in the iodine scrubber waste from the acid dissolver overheads. The differences for SIM-v2 are only +1.7% from SIM-v1 and are driven by tank leaks in WMA B-BX-BY. These very small I-129 changes are consistent with the little I-129 associated with tank leaks. However, I-129 is a major driver of risk in the groundwater because of its mobility. Hence, the I-129 inventories of the major contributing sites: 216-A-10, 216-A-5, 216-S-7, and 216-S1&2 were estimated from groundwater plume geometry. The SIM inputs were adjusted similar to those made in SIM-v1 per Appendix F. SIM-v2 used the same estimated input to these sites following the same basis. Site-wide I-129 partitioning is needed to analyze discharges from process distillate and spent nitric acid waste streams.

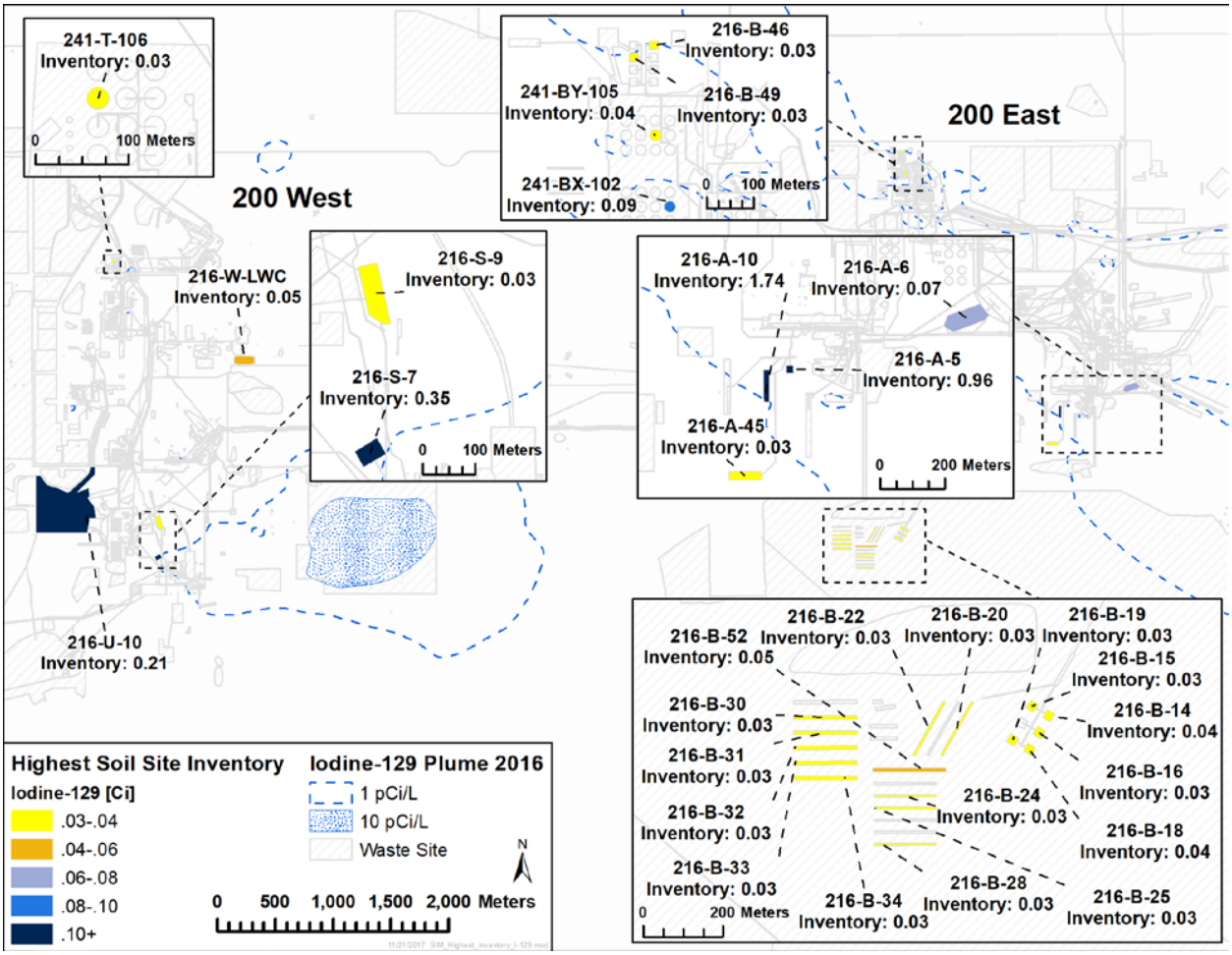

Figure 15. Most I-129 Release Volumes, East and West Area Cribs

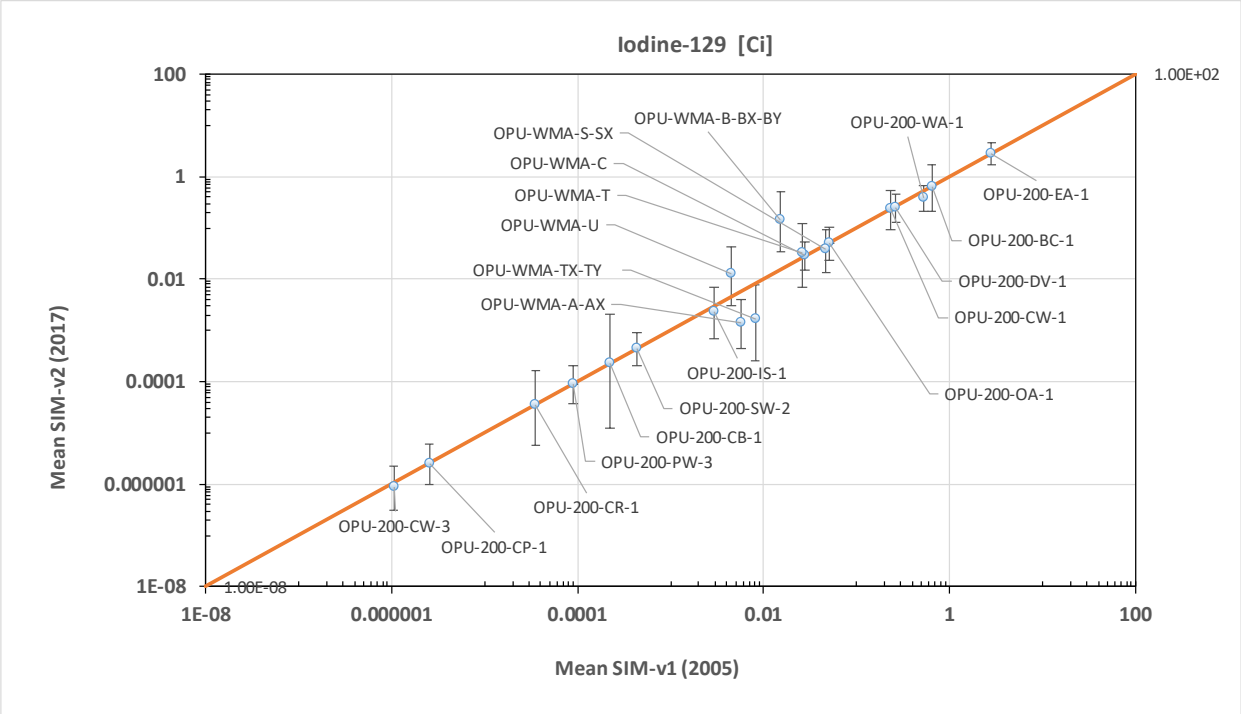

Figure 16. I-129 by OPU Between SIM-v2 and SIM-v1

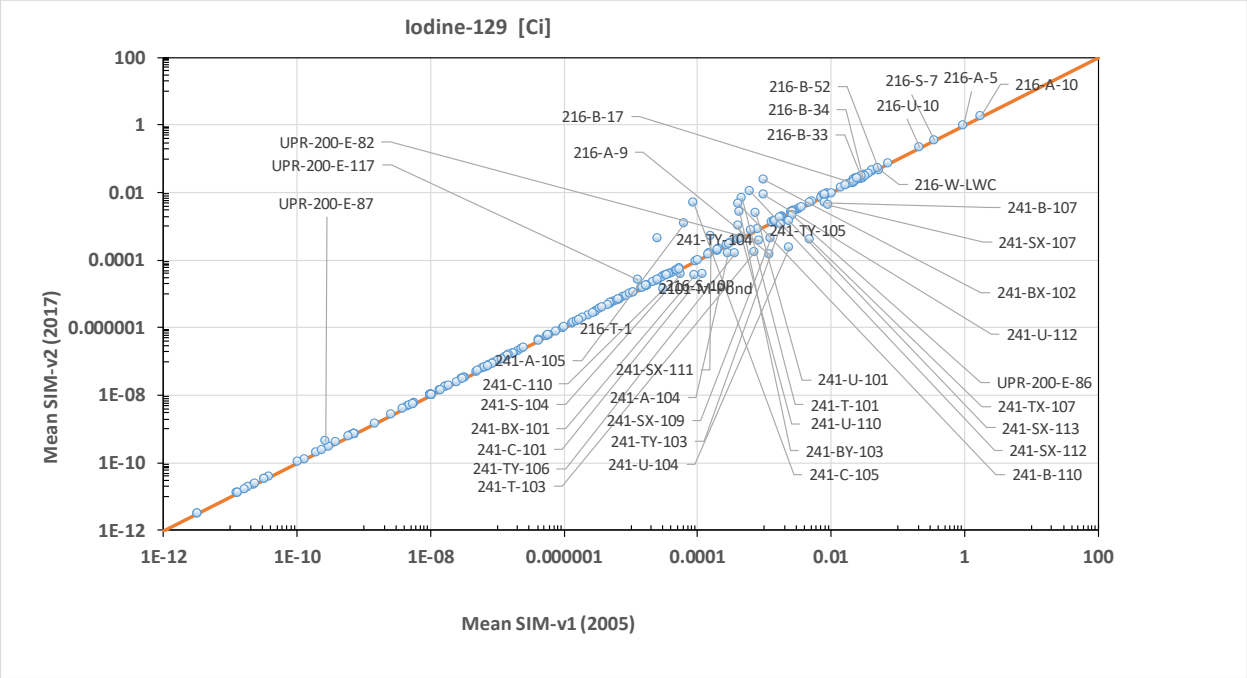

Figure 17. I-129 by SIMsite Between SIM-v2 and SIM-v1

7.2.5 U-238

There are 30 Ci of U-238 in SIM-v2 for 200 Area sites and 42% is in OPU 200-WA-1 in the West Area and 29% in OPU 200-EA-1 in the East Area. Figure 18 shows that the West Area inventory is mainly in 216-U-8, 216-U-12, and 216-U-10, while the East Area U-238 inventory is mainly in 216-B-12, 216-A-4, and 216-A-3. Figure 19 maps the sites in the 200 Areas. There was a 7% decrease in the U-238 SIM-v2 inventory compared to SIM-v1 mostly due to changes in 200-EA-1 and 200-WA-1. While U-238 inventory was relatively small in WMAs U and TX-TY, the U-238 reduction was pronounced since both WMAs were lower than the equivalence line as shown in Figure 20. Those WMA U-238 reductions were in the 99% confidence interval. Such differences are mainly due to tank leak updates listed in Table B-2. Figure 21 shows the changes were due to correcting the tank leak estimates and changed leak U-238 inventories were below 0.01 Ci. Figure 19 shows distribution for U-238 and locates the 32 Ci of U-238 in 216-U-8, 216-U-12, and 216-S-7 in West Area and 216-B-12, 216-A-25, and 216-A-4 in East Area.

It should be noted that additional uranium discharges that were treated in SIM-v1 as solids will be analyzed and reported separately with another SIM-v2 run with speciation and solubility analysis. As an example, site 216-A-19 that received 39 MT of uranium is not presented in these results since the currently estimated soluble portion is only 35 kg uranium. The large difference was characterized in SIM-v1 as solids portions of the waste stream and therefore will be checked with future SIM-v2 run and release modeling applying speciation and solubility limits.

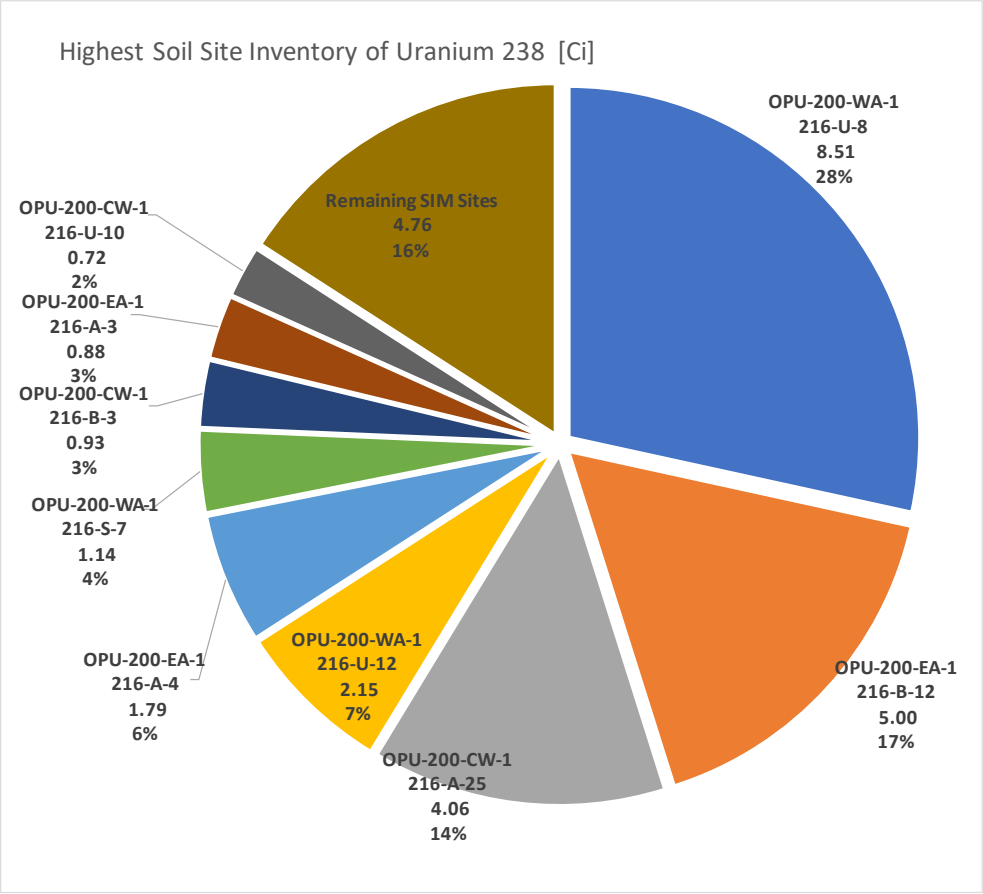

Figure 18. SIM-v2 U-238 for the Top Inventory Sites and OPUs

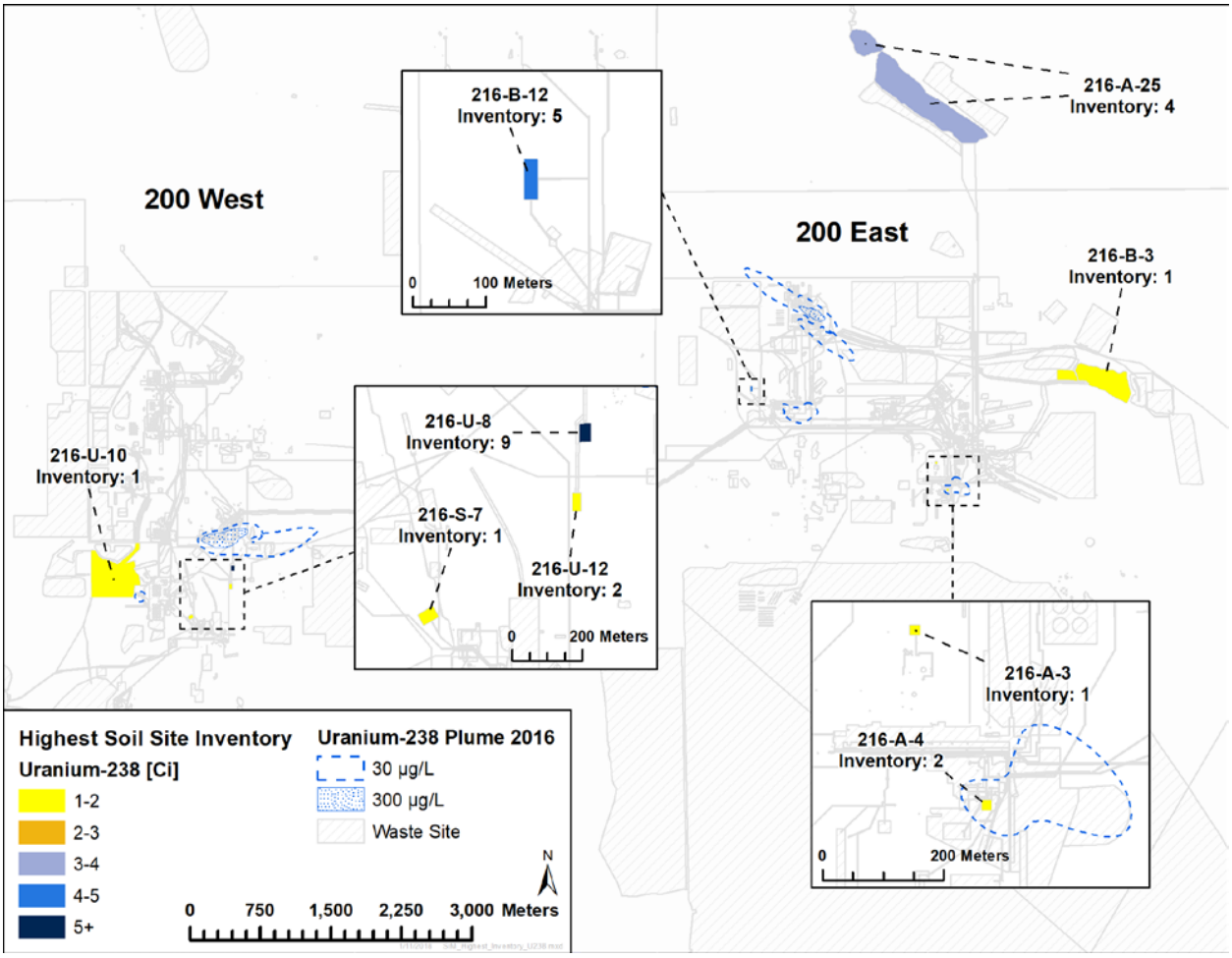

Figure 19. Most U-238 Release in the 200 Areas

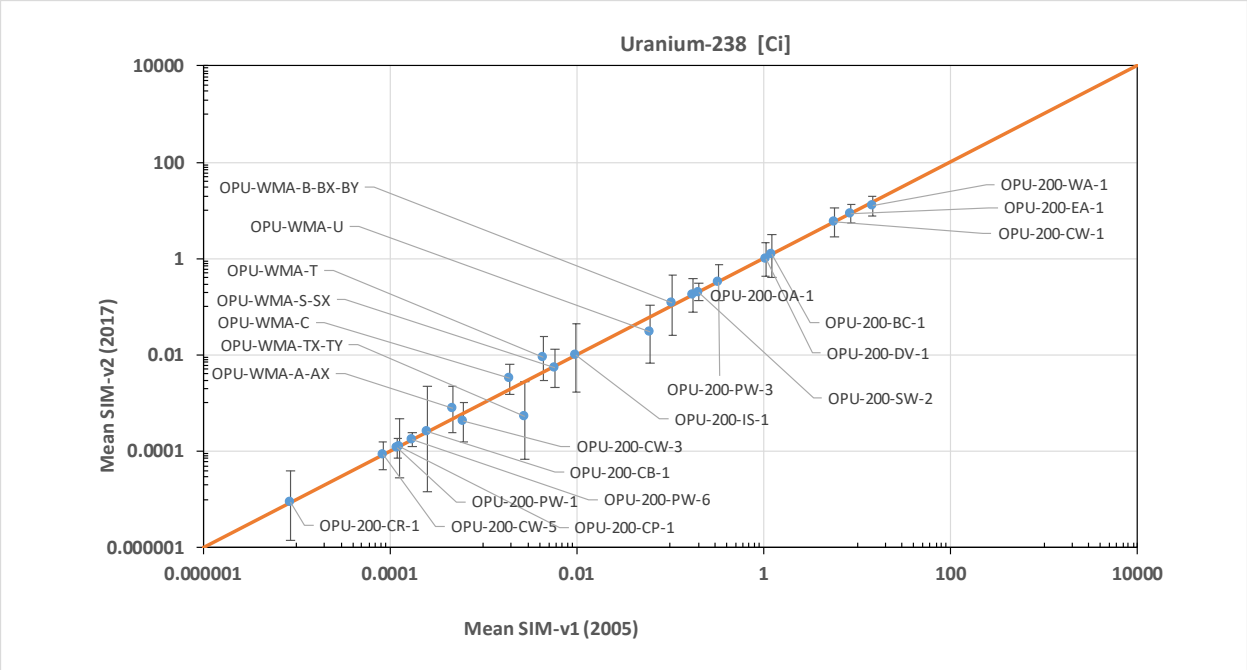

Figure 20. U-238 by OUs Comparing SIM-v2 and SIM-v1

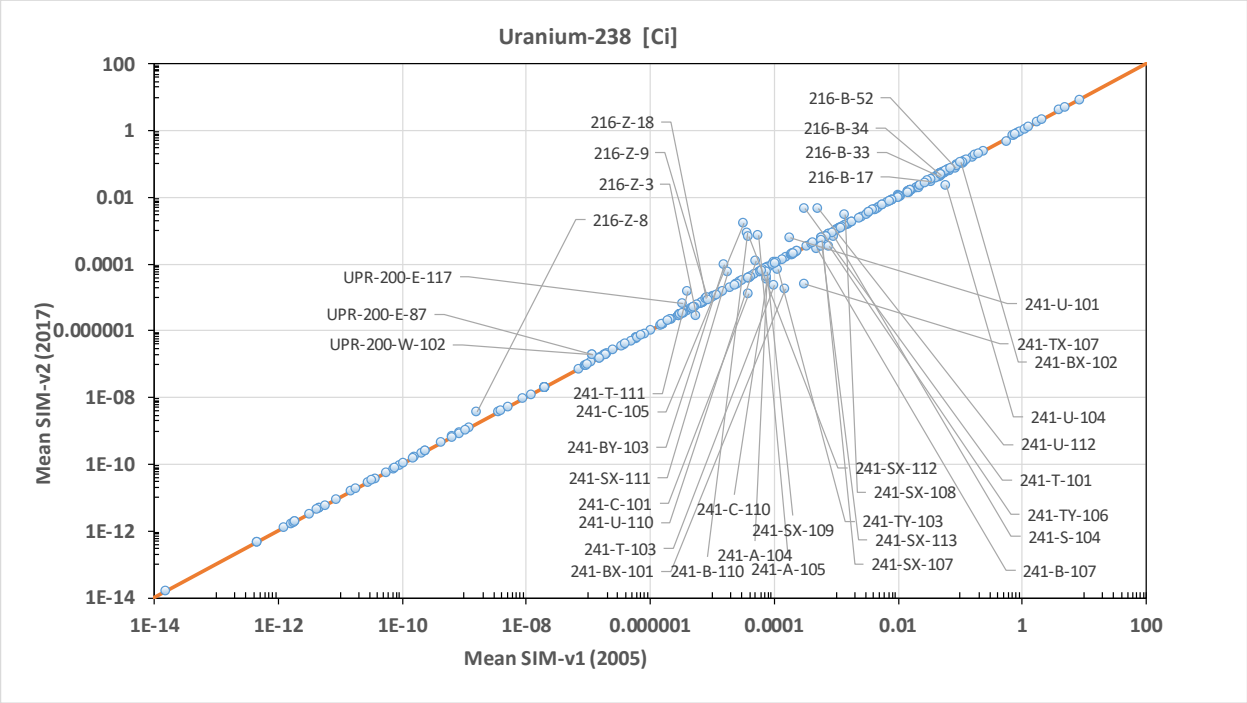

Figure 21. U-238 by Site Between SIM-v2 and SIM-v1

7.2.6 Strontium 90

The SIM-v2 Sr-90 48,000 Ci is mainly associated with 200-E-57 and 200-E-56 pipe line leaks from 200-E-149-PL (200-IS-1) and the tank leaks 241-T-106 and 241-BX-102 as shown in Figure 22. Therefore, Sr-90

is released nearby tank farms or tank leaks as mapped in Figure 23. The SIM-v2 is accounting only the liquid inventory portion of contributing waste streams that is more relevant to leak release. SIM-v1 accounted slightly more Sr-90 in solids portions although release was by leak mechanisms. Figure 24 compares the Sr-90 inventory estimates by SIM-v2 versus SIM-v1 liquid portions by OUs. The equivalence line either intersects with the 99% estimated confidence intervals or coincides with OPU mean inventory, which indicates the general equivalence of Sr-90 estimates and confirms the highest releases in the East Area. The above-mentioned sites are associated with leaks and deep vadose zone area. It should be noted that the relatively less soluble Sr-90 was reduced in WMA C leaks that SIM-v2 estimate compared to SIM-v1 while it was increased for Cs-137 and the relatively soluble Tc-99. These differences are due to embedded errors in solid phase separation in waste streams without considering a proper solubility modeling in SIM. SIM-v2 considers liquid releases only while SIM-v1 also assigned solid portions that were meant for tank inventory estimates (i.e., using HDW waste composition with estimated solids portions). Figure 23 R24 shows the Hanford Site distribution of Sr-90 is in the cribs 200-BC-1 and 200-EA-1 in the East Area and 200-DV-1 and various WMAs in the East and West Areas.

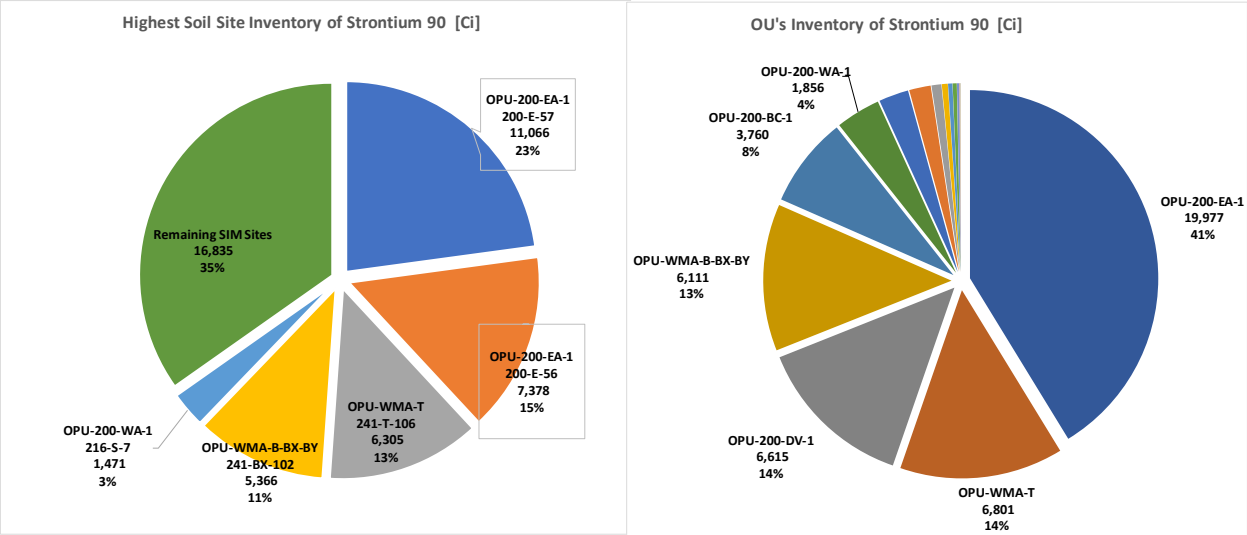

Figure 22. Sr-90 Inventory Distribution by Site and OPU

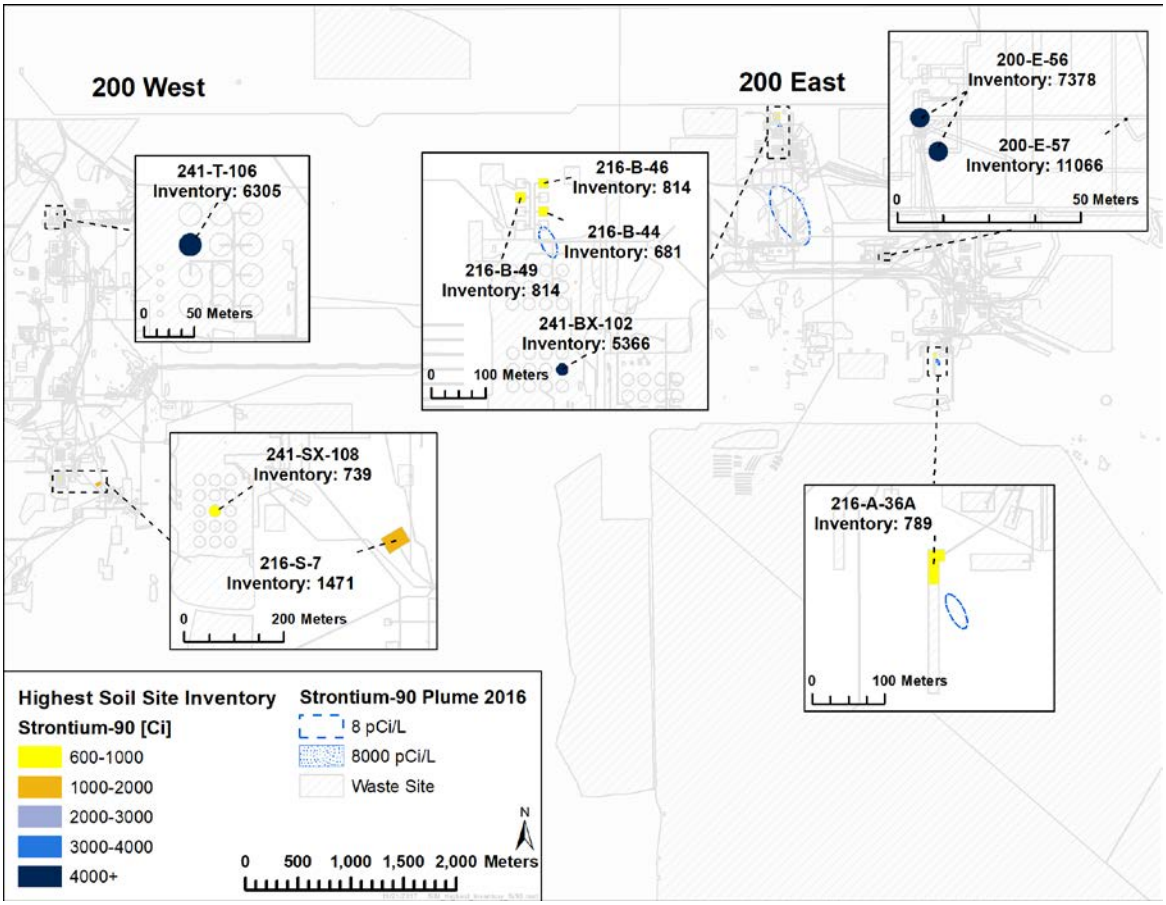

Figure 23. Most Sr-90 Release Inventory

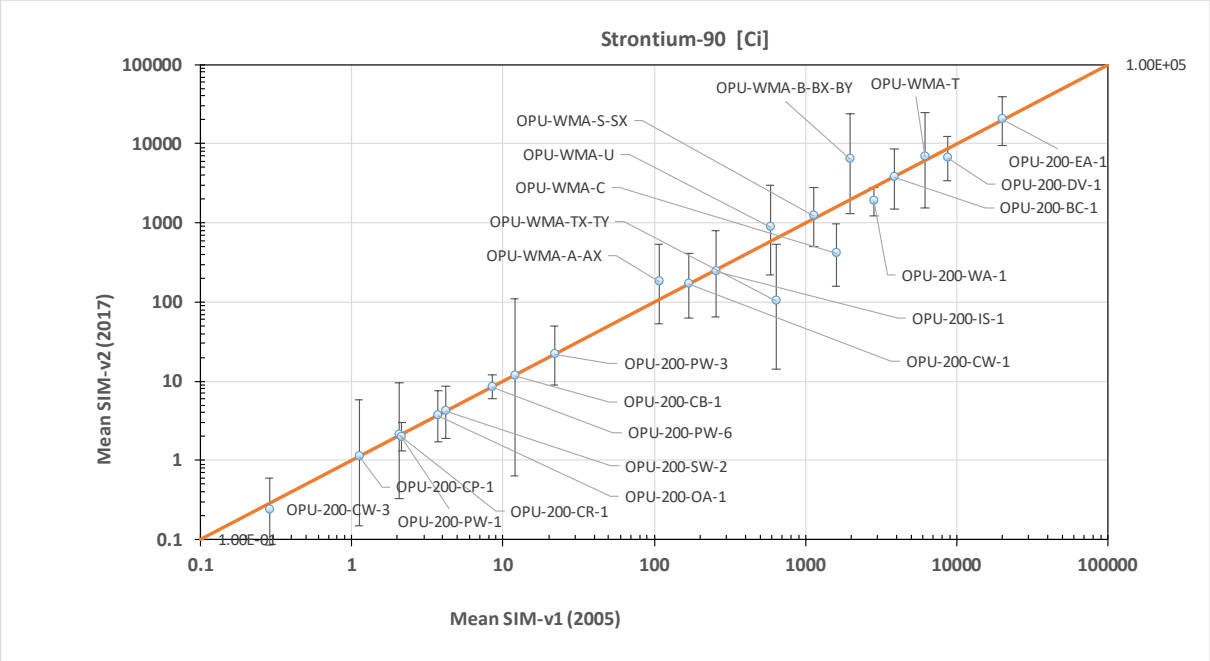

Figure 24. Comparing SIM-v2 and SIM-v1 Sr-90 Inventory in the Liquid Releases

7.3 Regrown Radionuclides Example

Figure 25 shows an example of the regrowth of Cs-137 for the SIMsites in operable unit 200-BC-1. With 30.167 yr half-life, Cs-137 is relatively short lived compared to other inventoried radionuclides. When regrown to ~1956, the discharged inventory is about three times those in 2001; thus, decay correction to discharge times would support accurate source term estimates for transport and fate studies.

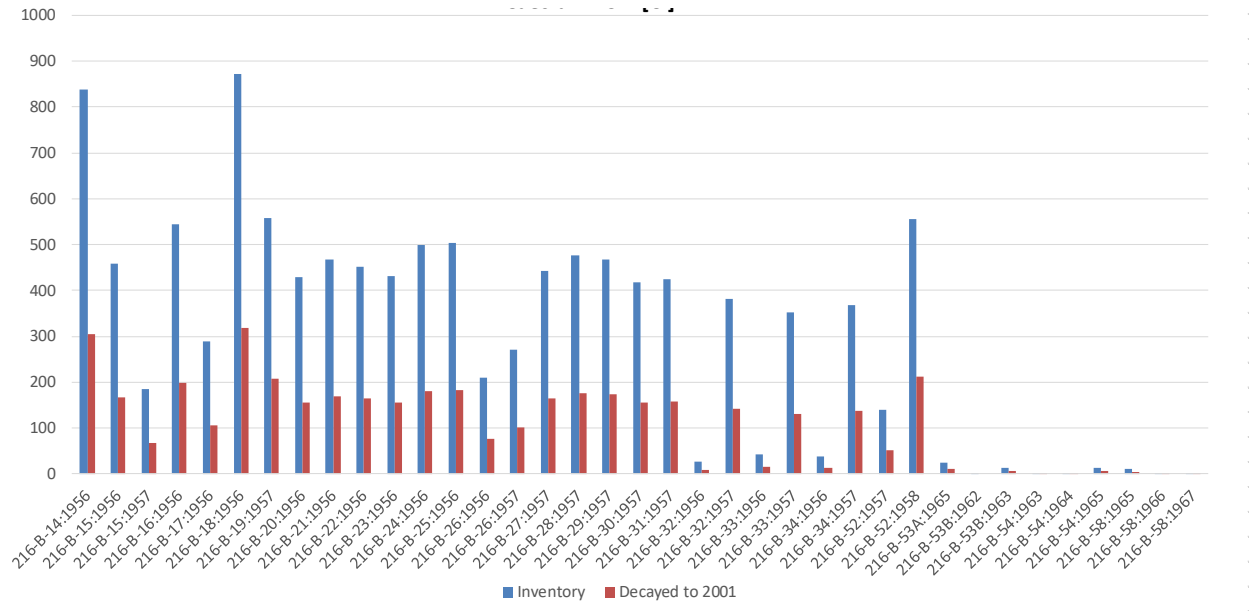

Figure 25. SIM-v2 Cs-137 Inventory (Ci) in the 200-BC-1 Cribs at Times of Discharge

Figure 26 presents the radionuclides affected by the regrow procedure compared to the decayed inventories to year 2001, the common date to which radionuclide inventories are typically decayed for the purpose of presentation. The differences from the equivalence line occur primarily for radionuclides whose half-life constants were relatively shorter than the maximum decay period of 55 years (1945-2000). The shift increases with shorter half-life constants. For the shown radionuclides, inventories of all sites are linear on the log-scale and parallel to the equivalence line. The exponential terms of the 1st and 2nd order decay causes linearity on the log-scale. A little scatter is shown due to regrowing to the end of each discharge year (i.e., different Δt). All listed short-lived radionuclides are shifted below and to the right of the equivalence line when regrown except Nb-93m, which has a half-life of 16.13 yr and daughter of longer half-life Zr-93 (half-life of 1.53e+006 yr). The slight difference of Nb-93m is likely a result of truncation error in the original decay calculation (i.e., in ORIGEN 2 and HDW) using a half-life of 16.1 yr as demonstrated in the EMDT-DE-0006 and decay calculations in SVF-2545. Thus, the initial discharge of niobium could be set to 0 and, therefore correct estimates will be reached by forward decay of Zr-9 confirmed with Nb-93m inventories being very small with few sites with inventories higher than one Ci.

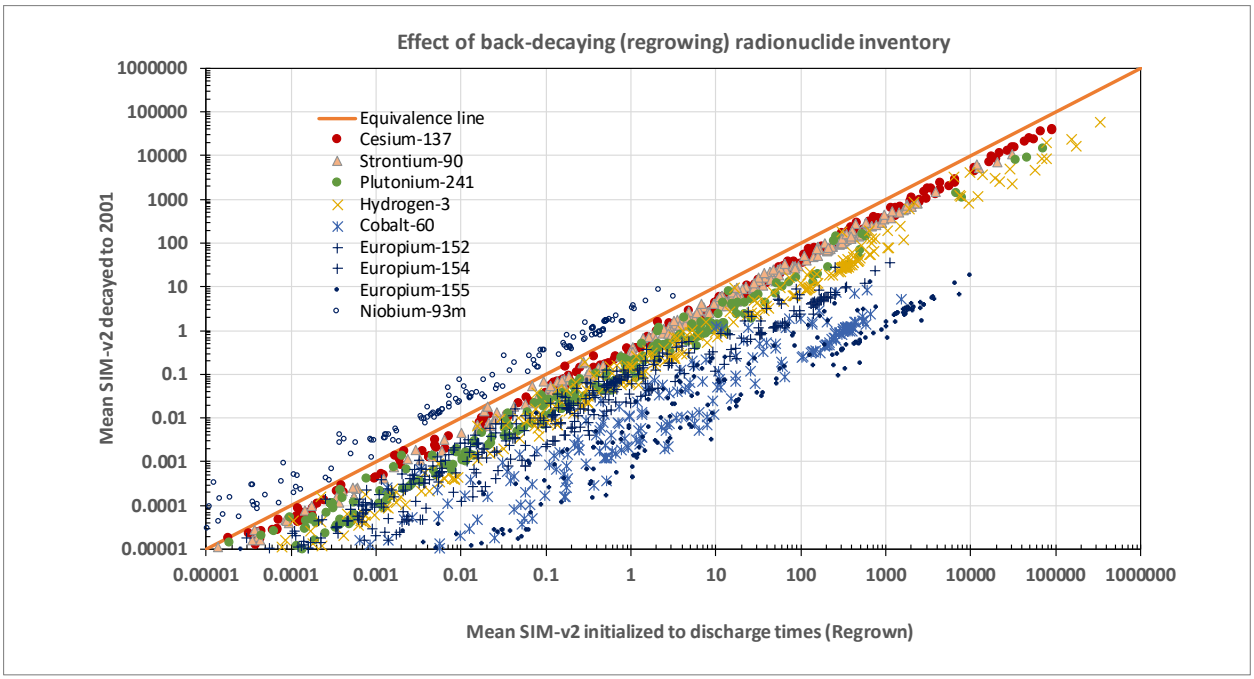

Figure 26. Back Decayed to Discharge Times Results of Inventoried Radionuclides

The regrown inventory results are reported in the digital output files accompanying this ECF report. Forward decay of the reported regrown inventories using the reported decay procedure provides an estimate of daughter radionuclides that were not reported as part of Hanford Site inventory databases such as BBI. Important examples are forward decay of U isotopes to estimate Th-230 and correct Ra-226 estimates.

7.4 Tank Leak Uncertainty for Cs-137

Appendix B describes the SIM-v2 tank leak updates based on the tank leak assessment reports. These tank leaks have been scaled to the assessed Cs-137 soil inventories based on the leak assessment reports (Figure 27), which indicates tank leak inventory results for Cs-137 compared to reported values from site investigation and analysis in tank leak reports listed in Table E-1 and values in Table E-3 all decayed to 2001.

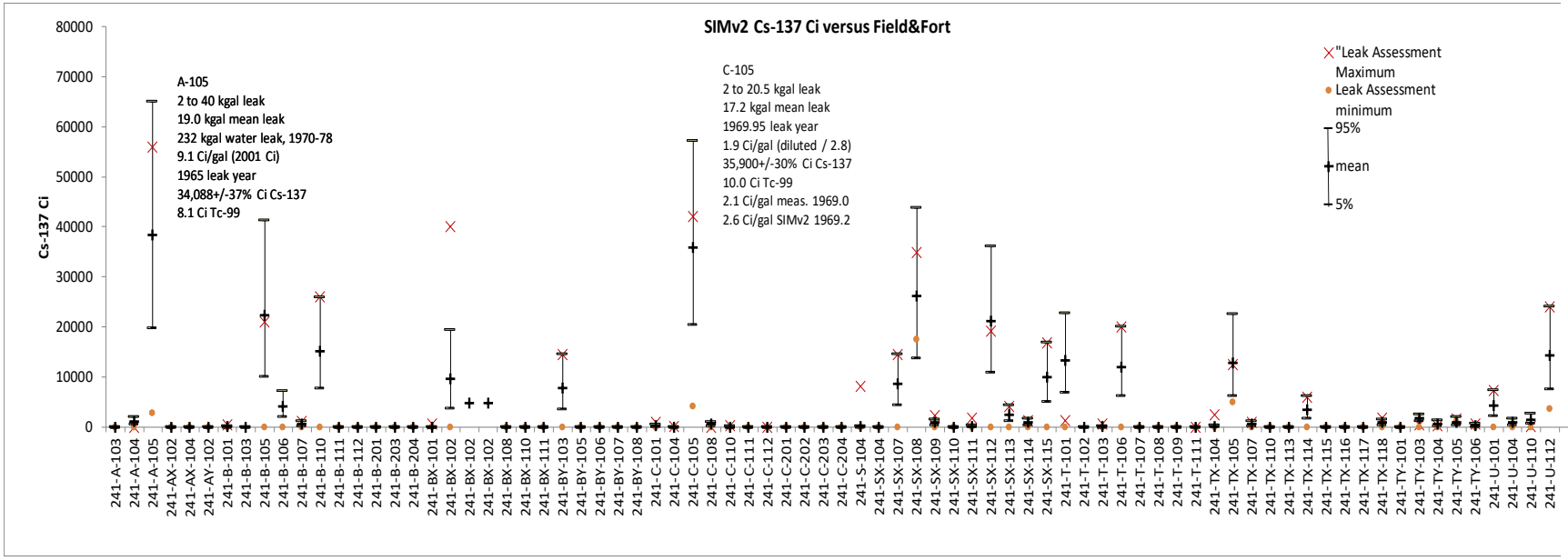

Figure 27. Cs-137 Ci 5% to 95% from Each Tank Leak from SIM-v2

There were many changes in tank leaks from various tank leak assessment reports listed in Appendix B. Figure 28 compares the Cs-137 inventory in the top 10 tank leak inventories by comparing regrown inventory (initialized to leak time) to decayed inventory reported in 2001.

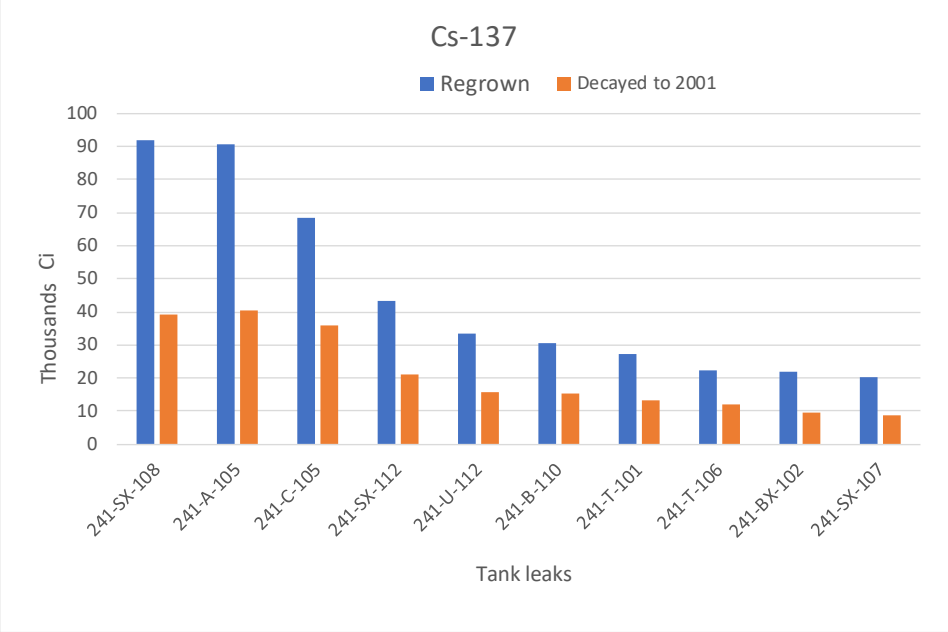

Figure 28. Top 10 Cs-137 Inventory from Tank Leaks

8 Conclusions

This report revises the SIM used to estimates the inventory from historical liquid discharges to about 400 sites located in the 200 East and 200 West Areas of the Hanford Site. Only radionuclide inventory is discussed and presented here as the purpose of this calculation is to provide inputs for the composite analysis (CA) per the DOE Order 435.1 requirements.

This revision is designated as SIM-v2 and incorporates the same basic information as previous version (designated as SIM-v1) but applies corrections and updates to the input volume and waste stream compositions associated with historical liquid discharges. The calculation methodology in SIM-v2 differs from the Monte Carlo-based approach implemented in SIM-v1 for propagating uncertainty. In the new methodology, uncertainty is propagated using a statistical/analytic approach that significantly reduces the computational burden.

Several updates and corrections have been undertaken in this revision. One significant change to the inventory estimate results from updates to the tank leaks and unplanned releases as per the latest leak assessment reports for various tank farms. The uncertainty associated with tank leak inventory is estimated rather than bounding estimates and compared with the SIM-v1 inventory estimates for key radionuclides. Another significant update to inventory estimates, which affects all waste sites, results from improving the uncertainty distribution for waste stream concentrations. The radionuclide waste stream concentration uncertainties (for a given campaign) are now based on the batch-to-batch variability in inventory normalized to MTU processed in each batch. Besides these, many Z Area waste site inventory estimates were updated based on re-evaluation of waste stream compositions.

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Appendix A

Radionuclide Uncertainties

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Figure A-2. Frequency of Cs-137 Ci for Campaign P2 with Maximum Parameter Scaling Beta PDF A-2

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Table

Table A-1. Beta Probability Distribution Function Parameters for Radionuclides A-6

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A1 Introduction

Adequate number of concentration measurements are not typically available for each waste stream within Hanford; thus, it is a challenge to quantify the uncertainty in concentrations for each constituent. In the absence of better information, the radionuclide concentration uncertainty definitions were derived for the Hanford soil inventory model (SIM)-v1 by fitting the temporal variability predicted by the ORIGEN2/DKPRO model (over the campaign duration) to standard probability distribution functions. ORIGEN2and DKPRO set the 46 fission products and neutron activated radionuclides for each of nine campaigns comprising 1,276 fuel batches.

A2 Assumptions

In SIM-v1, the assumption was that t batch variability for a given radionuclide defines concentration uncertainty over the duration of the campaign for that radionuclide. However, this assumption was misleading when long tail skewed distributions were estimated as indicated by the following example in Figure A-1. The frequency of the Cs-137 Ci for 130 batches of campaign P2 is shown along with the beta probability distribution function (PDF). Both variables are scaled so that the beta mean agrees with the P2 campaign average Ci/MTU. The distributions should be based on per production unit of MTU processed, as corrected in Figure A-2.

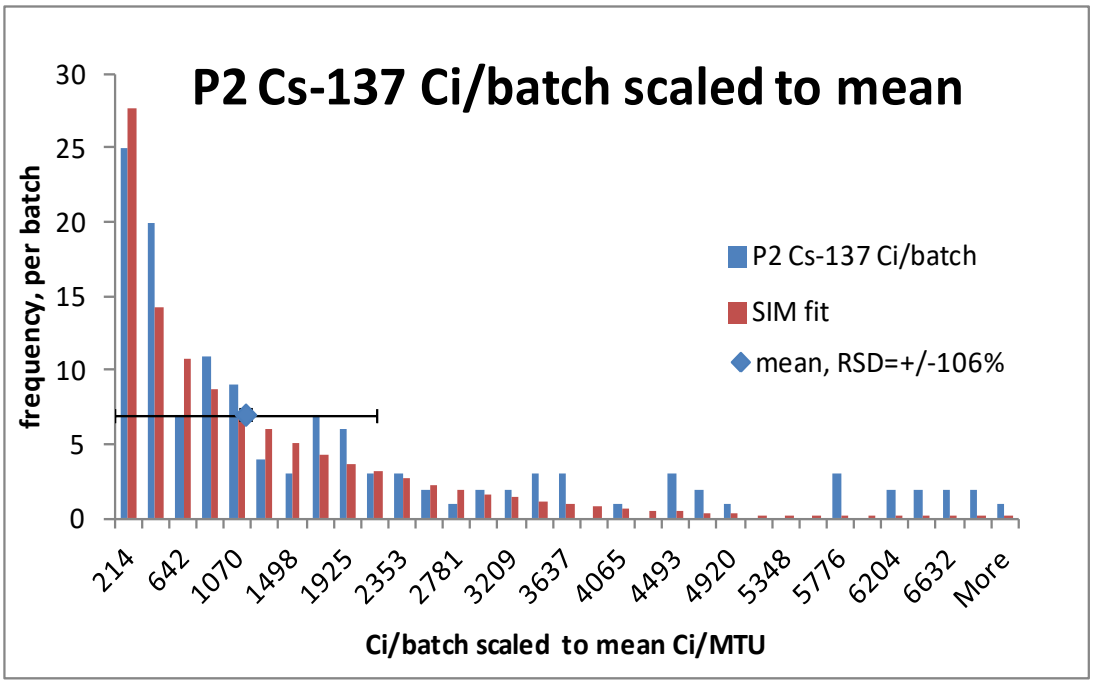

Figure A-1. Frequency of Cs-137 Ci for Campaign P2with the Beta PDF

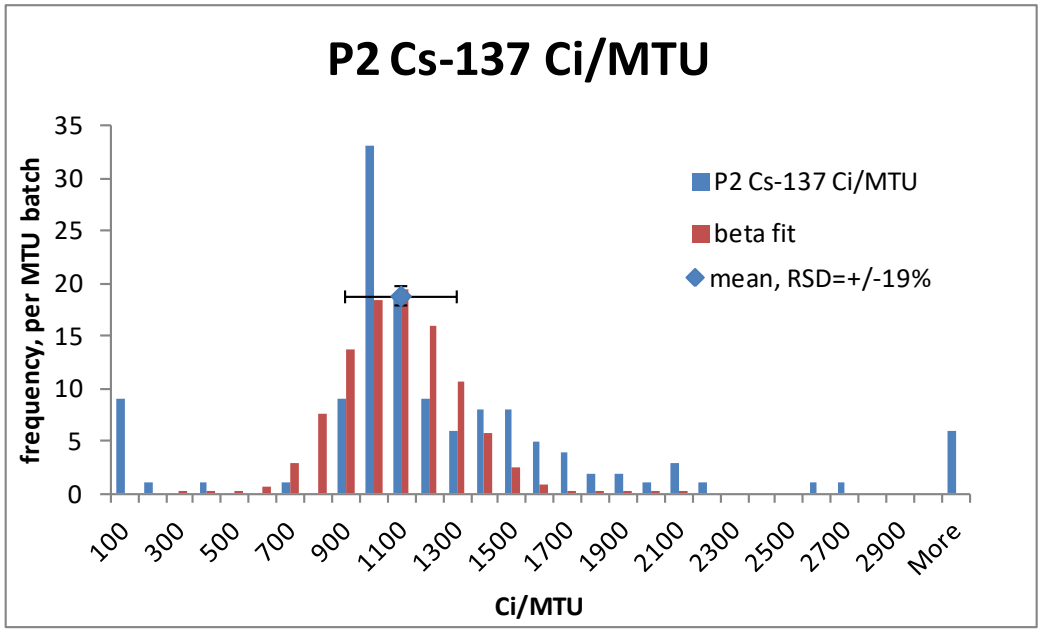

Figure A-2. Frequency of Cs-137 Ci for Campaign P2 with Maximum Parameter Scaling Beta PDF

A3 Process

The SIM-v1 followed two steps. First, it derived a variability basis for each radionuclide by fitting the radionuclides per batch frequency distribution with an appropriate PDF shown in Figure A-1 (for P2 waste stream). Then, SIM-v1 scaled that shape function's maximum to match the mean concentration (1064 Ci/MTU) for the campaign, even though the PDF was per batch, corrected by fitting the Ci/MTU/batch directly to the distribution as presented in Figure A-2.

A4 Results

Figure A-1 shows a PDF for Cs-137 with a significant likelihood of zero Ci/batch, which is incorrect because it means zero Ci/L when scaled to concentration. There were very few (if any) batches processed with a likelihood of zero Ci/L of Cs-137. The PDF based on Ci/MTU per batch in Figure A-2 shows the more appropriate frequency plot for the same 130 batches for campaign P2. The distribution is fitted using a beta PDF. Now the distribution centers around the actual mean and the PDF fit results in means that are close to the actual average of 1064 Ci/MTU. Further adjusting the beta distribution's maximum parameter from 3000 to 3080 provides that the mean of the beta agrees with the average of the campaign.

The relative standard deviation (RSD) from fitting the Ci/MTU is 19% in Figure A-2, which is much less than the 106% RSD in Figure A-1 from fitting the batch frequency plot. Thus, the SIM-v1 radionuclide distributions did not represent the actual radionuclide uncertainties well on a concentration basis. The likelihood of zero Ci/MTU batch is low and there were few zero Ci/MTU batches processed because by definition, there would have been no reason to process a batch with zero radionuclides because there would have been no product in such a batch.

Unlike fission products, the amounts of U, Th, Pu, and other transuranic (TRU) in the waste are residuals of extraction processes and have a much greater likelihood of zero Ci. The DKPRO algorithm and ORIGEN2 simulate extraction processes and set batch specific extraction efficiencies. It is therefore appropriate that TRU are reduced in the waste steams with an increased likelihood for zero amounts.

Figure A-3 and Figure A-5 through A-7 show selected PDF fits that represent typical results and those for all nine campaigns that appear in Appendix G. The SIM-v2 assigns all the PDFs for U, Pa, Th, Np, Am, and Cm to Pu and the PDFs for all other radionuclides to that for Cs-137. Figures A-4 through A-6 shows similar distributions for P1campaign. The same improvements shown above for P2 were achieved by fitting the Ci/MTU/batch data instead of fitting the Ci/batch and then scaling with the mean Ci/MTU (compare Figure A-4 with Figure A-5). In addition, fitting the P1 Cs-137 per batch spreads increases uncertainty and, therefore, increases probability of zero (or extreme values). Although, TRU can logically have zero values and there is no problem of increased probability of small/zero values, proper distribution and reduced uncertainty is obtained by fitting the Ci/MTU/batch value as shown for Pu-239 in Figure A-6. The same effect is also demonstrated for Tc-99 (Figure A-7).

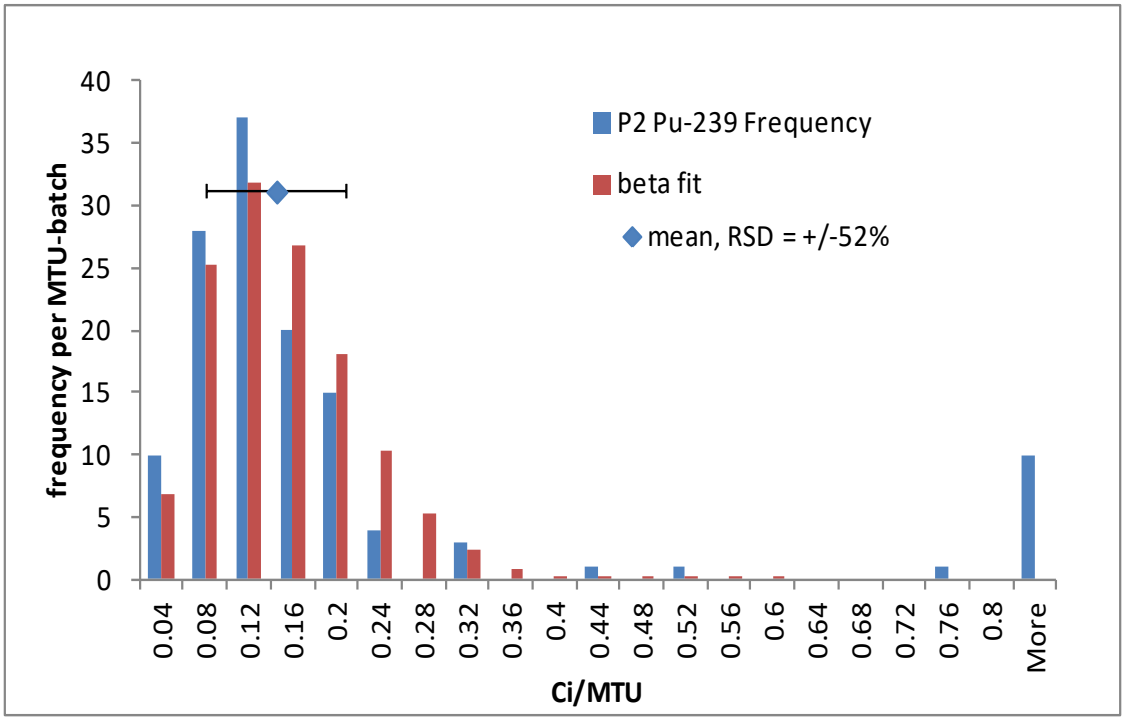

Figure A-1. Frequency of Pu-239 Ci/MTU for Campaign P2 with Maximum Parameter Beta PDF Scaling

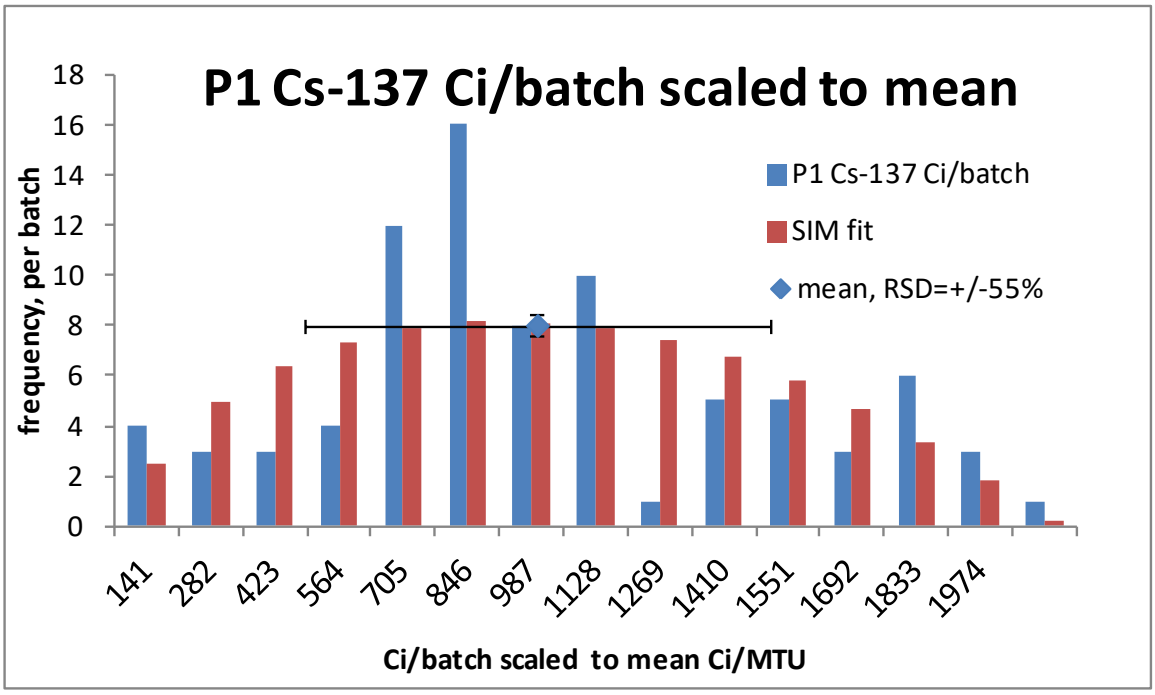

Figure A-2. Frequency of Cs-137 Ci/batch for Campaign P1 along with Maximum Parameter Beta PDF

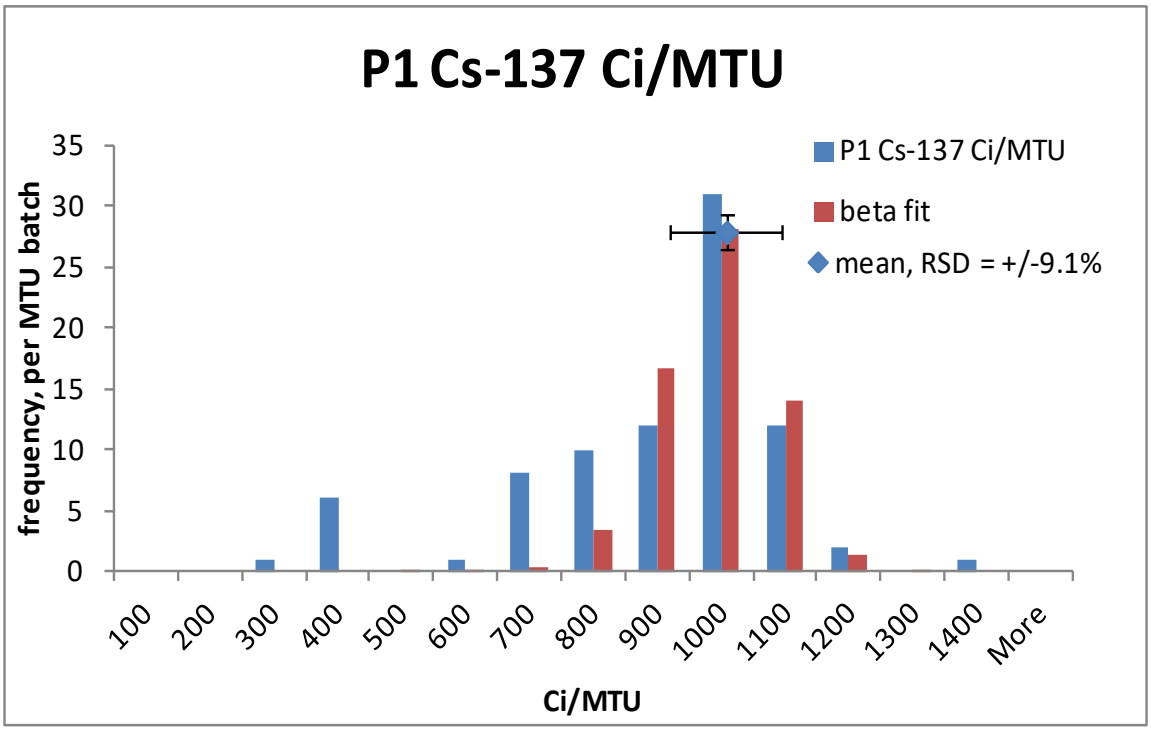

Figure A-3. Frequency of Cs-137 Ci/MTU/Batch for Campaign P1 with Maximum Parameter Beta PDF

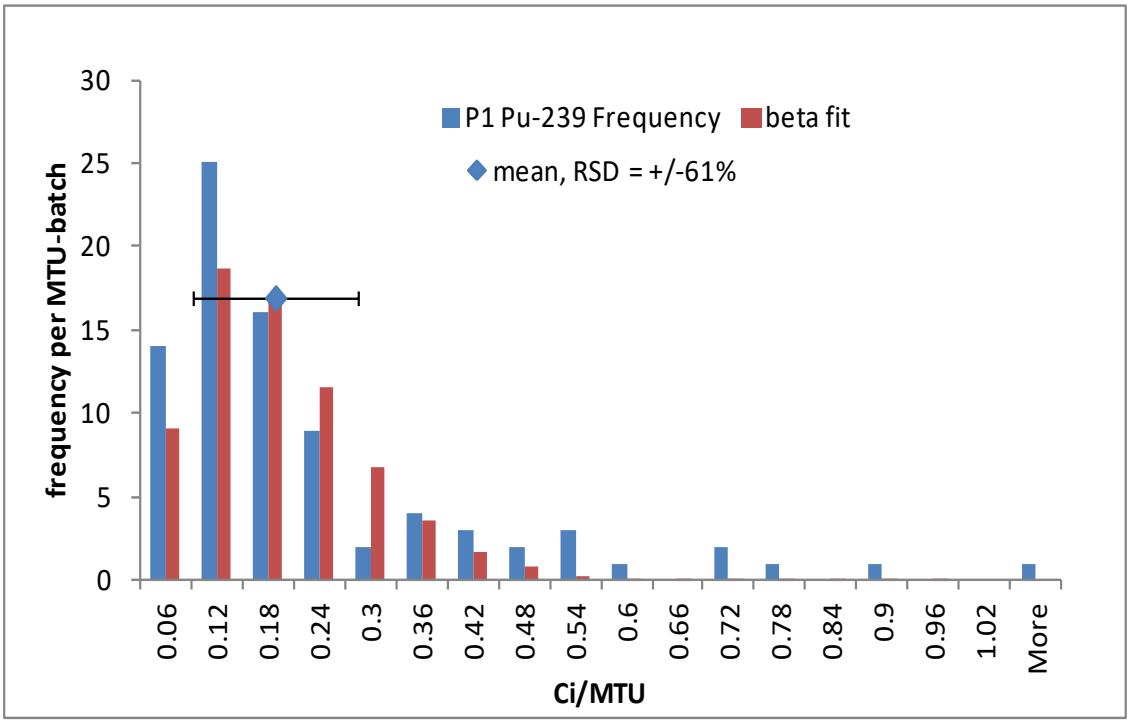

Figure A-4. Frequency of Pu-239 Ci/MTU/Batch for Campaign P1 with Maximum Parameter Beta PDF

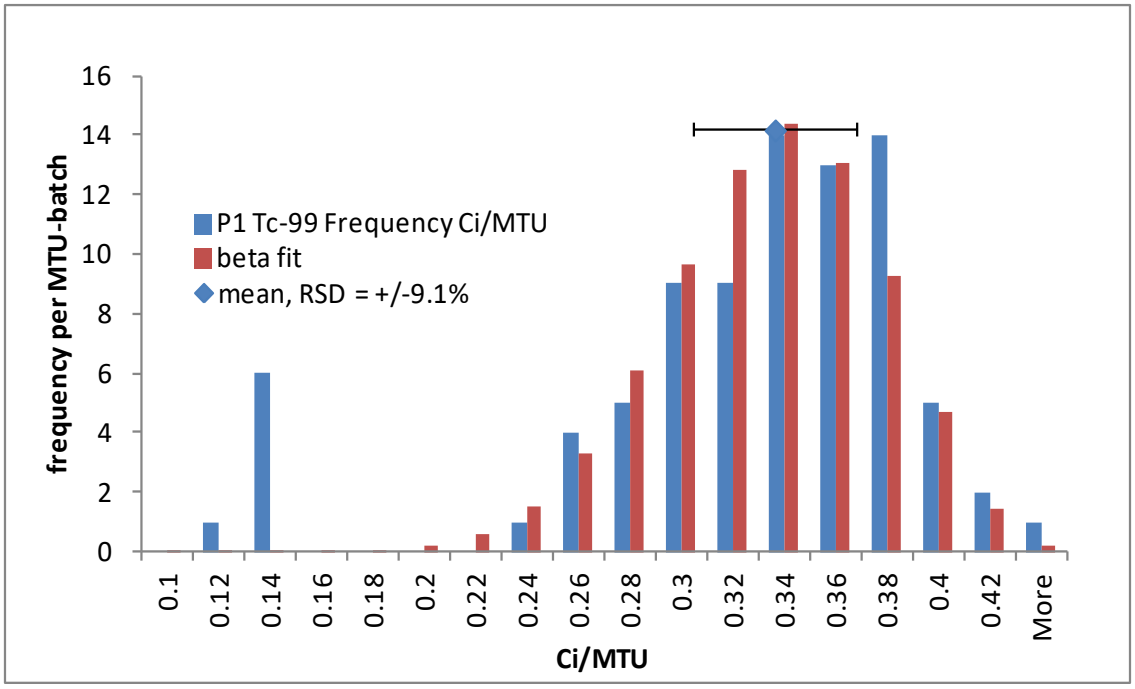

Figure A-5. Frequency of Tc-99 Ci/MTU/Batch for Campaign P1 with Maximum Parameter Beta PDF

The same fitting procedure was repeated for the campaigns presented in Table A-1. The beta distributions and RSD values were determined for Pu-239 and Cs-137 for each campaign. The same beta distribution parameters: alpha and beta and the corresponding RSD for Pu-239 were implemented for transuranic (and

uranium) with scale based on their mean Ci/MTU. Similarly, the beta distribution parameters for Cs-137 were applied to the fission products with scaling to their mean Ci/MTU.

Table A-1. Beta Probability Distribution Function Parameters for Radionuclides

Campaign	Pu-239					Cs-137				
	Ci/ MTU	PDF		Max	RSD	Ci/ MTU	PDF		Max	RSD
		Alpha	Beta				Alpha	Beta		
BT1	0.423	239	638	1.55	5.5%	227	242	272	483	5%
BT2	0.666	2.7	1.3	0.986	31%	418	1.8	1.0	651	38%
R1	0.238	1.9	5.5	0.942	59%	654	91.3	70.6	1159	6.9%
R2	0.129	2.9	16.9	0.862	53%	1199	22.2	45.5	3655	17%
P1	0.161	2.3	18.2	1.43	61%	882	39.5	19.4	1316	9.1%
P2	0.130	3.0	16	0.821	52%	1065	17.4	33.0	3080	19%
P2prime	0.418	1.2	41.8	15.4	90%	1600	8.5	13.4	4130	26%
P3AZ1 +P3AZ2	1.90	71.2	76.7	3.94	8.5%	2554	11.9	19.9	6806	23%

Appendix B

Tank Leak Updates

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B1 Introduction

This appendix describes how tank leak inventory is updated and associated uncertainty estimated. Three main sources of information were utilized to achieve this update. First is the composition of the tank waste at time of the leak defined by the feeding waste streams. The other two sources are leak volumes and estimates of Cs-137 plumes as retrieved from tank leak reports.

B2 Updates

This section is organized in three parts. The first briefly describes the general and step-wise approach used to update the tank leak inventory with evaluation of associated uncertainty; the second explains the basis used to evaluate uncertainty. Finally, the third part describes the reported leak information, updates references and suggested future improvements and maintenance of tank leak inventory.

B2.1 Unified Approach for Update and Uncertainty Estimate

This section describes the step-wise approach used to update the tank leak inventory with associated uncertainty. as follows:

- Account for common uncertainty sources
- Add water as waste stream to account for dilution and concentration.
- Initialize tank leaks according to SIM-v1 values and account for uncertainty of feeding waste streams, reported leak volumes and reported Cs-137 from soil investigation:
  - Three volume records are calculated in “SMMbyQtrsSIMe.xlsx” to account for uncertainty of waste streams feeding the tank prior to tank leaks. First record is the total tank volume (Vol_T) by the end of the leak year. Second record is the leak volume (Vol_L) as it was implemented in SIM-v1 based on tank level changes. Finally, an array of total volumes discharged from each waste stream was calculated for each tank by the end of the leak year (Vol_{ws}).
  - The three columns Vol_T, Vol_L and Vol_{ws} are copied to the Microsoft® Excel® file SIMrev2 and sheet SIMbyYear so that the mean and the scale of the Beta distribution (with $\alpha=\beta=1.5$ as explained in the next section) of waste stream contributions to the leak are calculated as follows:
    - Mean(kgal)=Vol_L* Vol_{ws}/Vol_T
    - Max(ML)= mean*$(\alpha+\beta)/\alpha$ 0.003785[ML/kgal]
  - Update the volume beta distributions of the tank leaks according to reviewed leak reports listed in the sheet “FieldLeakVolume”; i.e., update Vol_L. The reported mean volume is listed in column F as the median of the minimum-maximum range assuming a minimum of zero if there was no minimum reported. Beta distribution scale is evaluated as function of the mean leak volume.
  - Evaluate the Cs-137 uncertainty ranges and compare with estimated leaked Cs-137 from tank leak reports

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- For tanks whose reported leaked Cs-137 is higher than the estimated uncertainty range the uncertainty range and the mean volume are updated by matching the 95%-tile Cs-137 to reported maximum Cs-137.
- Update beta distribution for the leak volume scaled for tank C-105, fitting the 95% Tc-99 to match the 9.8 Ci estimate of Tc-99. The upper estimate of Tc-99 from C-105 leak was 9.8 Ci as reported in the WMA C leak inventory assessment report (RPP-ENV-33418, *Hanford C-Farm Leak Inventory Assessments Report*, Rev. 4).

- Add newly reported leaking tanks following the procedure in item 1; added tanks are: 241-B-101, 241-B-105, 241-B-106, 241-BX-102, 241-C-104, 241-C-108, 241-C-112, 241-SX-114, 241-T-102, 241-TX-104, 241-TX-105, 241-TX-114, 241-TX-118.
- Update waste streams according to SMM vector for the following leaks: 241-SX-107, 241-SX-108, 241-SX-109.
- Update leak year and the corresponding SMM vector for the following tank leaks: 241-B-110, 241-BY-107, 241-C-101, 241-S-104, 241-SX-111, 241-TX-107, 241-TY-103, 241-SX-108.

B2.2 Basis for Selecting Beta Distribution for Leak Volume Uncertainty

Tank leak volumes have been updated with the tank leak assessments for various farms and tanks (see Tables B-1 and B-2). The SIM-v1 did not report any tank leak volume uncertainties. However, the leak estimates were still subject to the uncertainties in composition, so SIM-v1did report the inventory uncertainties without accounting for the volume uncertainties.

Table B-1. Information and Sources for Tank Farm Leak Assessments [a]

Type of Information	Examples [b]
In-tank liquid level measurements	Surveillance Analysis Computer System
	Hanford Works Process records
Waste transfer records	RPP-19822, *Hanford Defined Waste Model – Revision 5*.
	WHC-MR-0132, *The History of the 200 Area Tank Farm*
Tank process reports and assessments	HNF-EP-0182, *Waste Tank Summary Reports* and associated references
	RPP-RPT-29191, *Supplemental Information Hanford Tank Waste Leaks*.
	Tank process records
	Occurrence reports
	8901832B R1, "Single-Shell Tank Leak Volumes: Letter, G.J. Bracken, DOE-RL, to President, WHC, same subject, WMD:JEN, dated April 27, 1989."
	HNF-2603, *A Summary and Evaluation of Hanford Site Tank Farm Subsurface Contamination*.
	HNF-4872, *Single-Shell Tank Leak History Compilation, Volume I of II: Summary*.
	SD-WM-TI-356, *Waste Storage Tank Status and Leak Detection Criteria, Vol[s]. 1 & 2*.
	RHO-CD-896, *Review of Classification of Nine Hanford Single-Shell "Questionable Integrity" Tanks*.

Table B-1. Information and Sources for Tank Farm Leak Assessments [a]

Type of Information	Examples [b]
	RPP-10435, *Single-Shell Tank Integrity Assessment Report*.
	WHC-MR-0132
	WHC-MR-0264, *Tank 241-A-105 Leak Assessment*.
	WHC-MR-0300, *Tank 241-SX-108 Leak Assessment*.
	WHC-MR-0301, *Tank 241-SX-109 Leak Assessment*.
	WHC-MR-0302, *Tank 241-SX-115 Leak Assessment*.
Vadose Zone Program field investigation results	Farm and Tank Specific Grand Junction Reports and Addendums (GJ-HAN)
	HNF-4936, *Subsurface Conditions Description Report for the S-SX Waste Management Area*.
	HNF-5507, *Subsurface Conditions Description Report for the B-BX-BY Waste Management Area*.
	RPP-7123, *Subsurface Conditions Description Report for the T-and TX-TY Waste Management Areas*.
	RPP-14430, *Subsurface Conditions Description Report for the C and A-AX Waste Management Area*.
	RPP-15808, *Subsurface Conditions Description Report for the U Waste Management Areas*.
	HNF-5231, *Historical Vadose Zone Contamination from B, BX, and BY Tank Farm Operations*.
	RPP-6285, *Inventory Estimates for Single-Shell Tank Leaks in S and SX Tank Farms*.
	RPP-7218, *Preliminary Inventory Estimates for Single-Shell Tank Leaks in T, TX, and TY Tank Farms*.
	RPP-7389, *Preliminary Inventory Estimates for Single-Shell Tank Leaks in B, BX, and BY Tank Farms*.
	RPP-7494, *Historical Vadose Zone Contamination from A, AX, and C Tank Farm Operations*.
	RPP-7580, *Historical Vadose Zone Contamination from U Tank Farm Operations*.
	RPP-7884, *Field Investigation Report for Waste Management Area S-SX*.
	RPP-10098, *Field Investigation Report for Waste Management Area B-BX-BY*.
	RPP-23752, *Field Investigation Report for Waste Management Areas T and TX-TY*.
	RPP-20820, *Waste Retrieval Leak Evaluation Report: Single-Shell Tanks*.
	DOE/ORP-2005-01, *Initial Single-Shell Tank System Performance Assessment for the Hanford Site*.
	RPP-26744, *Hanford Soil Inventory Model, Rev. 1*.

Table B-1. Information and Sources for Tank Farm Leak Assessments [a]

Type of Information	Examples [b]
	GJO-2003-545-TAC, Hanford 200 Areas Spectral Gamma Baseline Characterization Project, *B-BX-BY WMA and Adjacent Waste Sites Summary Report*.
	Tribe and Stakeholder correspondence and related reports
Gross gamma and spectral gamma logging data	RPP-8820, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-A Tank Farm – 200 East*.
	RPP-8821, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-AX Tank Farm – 200 East*.
	HNF-5433, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-B Tank Farm – 200 East*.
	HNF-3531, *Analysis of Historical Gross Gamma Logging Data from BX Tank Farm*.
	HNF-3532, *Analysis of Historical Gross Gamma Logging from BY Tank Farm*.
	RPP-8321, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-C Tank Farm – 200 West Area*
	HNF-4220, *Analysis and Summary of Historical Dry Well Gamma Logs for S Tank Farm – 200 West*.
	HNF-3136, *Analysis Techniques and Monitoring Results, 241-SX Drywell Surveillance Logs*.
	RPP-6088, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-T Tank Farm – 200 West*.
	RPP-6353, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-TX Tank Farm – 200 West*.
	HNF-3831, *Analysis of Historical Gross Gamma Logging Data from TY Tank Farm*.
	RPP-7729, *Analysis and Summary Report of Historical Dry Well Gamma Logs for 241-U Tank Farm - 200 West*.
	Annual Monitoring Reports
Groundwater data	Annual and quarterly groundwater reports and Hanford Environmental Information System (HEIS) data
Lateral data	RPP-RPT-27605, *Gamma Surveys of Single-Shell Tank Laterals for A and SX Tank Farms*.
SGE/direct push data	RPP-RPT-28955, *Surface Geophysical Exploration of T Tank Farm at the Hanford Site*.
	SGE and direct push data for completed farms

a. Adapted from RPP-32681, Process to Assess Tank Farm Leaks in Support of Retrieval and Closure Planning, Rev. 2.

b. For the significant number of items noted in this column, please refer to the References chapter for full citations.

The SIM-v2 tentatively assigns all leak volume uncertainties to a beta distribution that results in a Relative Standard Deviation (RSD) = (Standard Deviation / Mean) of +/-50% as demonstrated for tank C-105. The assessment reports in Table B-2 show tank leak volume as a range or as a maximum value. If the minimum value is not provided, SIMv2 assumes that the minimum leak volume is zero. The SIMv2 further assumes that there is a mean leak that is the average of the range and Figure B-1 shows a triangular distribution for such a case. Figure B-1 shows the suggested beta distribution at 50% RSD along with the triangular at 41% and lognormal at 50% RSD. Figure B-2 shows the generic distribution specifically for tank C-105 matching the reported leak volume range

Table B-2. Inventory of Cs-137 Ci and Leak Volume for Assessments and SIM-v2

Tank Leak	Reference [a]	Cesium-137 (Ci)			Leak volume (gal)			SIM-v2 [b]
		Mean	Lower Bounds	Assessment Upper Bounds	Min	Assessment Upper Bounds	Mean	
241-A-103	RPP-ENV-37956_Rev2_A_AX							
241-A-104		0.3	0	0.6	0	2000	1000	
241-A-105		29400	2800	56000	2000	250000	126000	19000
241-AX-102								
241-B-101	RPP-RPT-49089_Rev0_B	225	0	450	0	2000	1000	
241-B-105		10500	0	21000	0	72000	36000	
241-B-106		0	0		0	37000	18500	
241-B-107		550	0	1100	0	14000	7000	
241-B-110		13000	0	26000	0	13000	6500	21500
241-B-112								
241-B-201								
241-B-203								
241-B-204								
241-BX-101	RPP-RPT-47562_Rev0_BX	350	0	700	0	900	450	
241-BX-102		20000	0	40000	0	140000	70000	Two leaks 91.6+33= 124,600
241-BX-108								
241-BY-103	RPP-RPT-43704_BY	7250	0	14500	0	5,500	2750	14300
241-BY-107								
241-BY-108								
241-C-101	RPP-ENV-33418_Rev4	450	0	900	0	37000	18500	
241-C-104		40	0	80	0	28000	14000	
241-C-105		23100	4200	42000	2000	20500	11250	17200

Table B-2. Inventory of Cs-137 Ci and Leak Volume for Assessments and SIM-v2

Tank Leak	Reference [a]	Cesium-137 (Ci)			Leak volume (gal)			SIM-v2 [b]
		Mean	Lower Bounds	Assessment Upper Bounds	Min	Assessment Upper Bounds	Mean	
241-C-108	RPP-ENV-33418_Rev4	26	0	52	0	18000	9000	
241-C-110		175	0	350	0	2000	1000	
241-C-111								
241-C-112		10	0	20	0	7000	3500	
241-C-201								
241-C-202								
241-C-203								
241-C-204								
241-S-104	RPP-RPT-48589_241-S	4100	0	8200	0	24000	12000	
241-SX-104	RPP-ENV-39658_SX							
241-SX-107		7250	0	14500	0	6000	3000	5990
241-SX-108		26175	17450	34900	50000	100000	75000	
241-SX-109		1135	0	2270	0	1000	500	
241-SX-110								
241-SX-111		915	0	1830	0	2800	1400	
241-SX-112		9600	0	19200	0	27000	13500	
241-SX-113		2040	0	4080	0	15000	7500	
241-SX-114		655	0	1310	0	2000	1000	
241-SX-115		8400	0	16800	0	51000	25500	30216
241-T-101	RPP-RPT-55084_Rev0_T	650	0	1300	0	264000	132000	
241-T-102					50	500	275	
241-T-103		300	0	600	0	1300	650	
241-T-106		10000	0	20000	0	115000	57500	109527

Table B-2. Inventory of Cs-137 Ci and Leak Volume for Assessments and SIM-v2

Tank Leak	Reference [a]	Cesium-137 (Ci)			Leak volume (gal)			SIM-v2 [b]
		Mean	Lower Bounds	Assessment Upper Bounds	Min	Assessment Upper Bounds	Mean	
241-T-108	RPP-RPT-55084_Rev0_T							
241-T-109								
241-T-111		0.45	0	0.9	0	2100	1050	
241-TX-104	RPP-RPT-50870_241-TX	1250	0	2500	0	25000	12500	
241-TX-105		8750	5000	12500	50000	125000	87500	
241-TX-107		515	0	1030	0	1300	650	
241-TX-114		3000	0	6000	0	7000	3500	
241-TX-118		880	0	1760	0	1750	875	
241-TY-101	RPP-RPT-42296_Rev0_TY							
241-TY-103		211	0	422	0	3600	1800	
241-TY-104		147	0	294	0	1400	700	
241-TY-105		1443.02	1186.05	1700	30000	43000	36500	
241-TY-106		360	0	720	0	18000	9000	
241-U-101	RPP-RPT-50097_Rev0_U	3700	0	7400	0	30000	15000	
241-U-104		0	0		0	109000	54500	
241-U-110		75.6	25.2	126	5000	25000	15000	
241-U-112		13789.5	3578.95	24000	8500	57000	32750	57316

a. For the significant number of items noted in this column, please refer to the References chapter for full citations.

b. Adjusted mean volume fitting Cs-137.

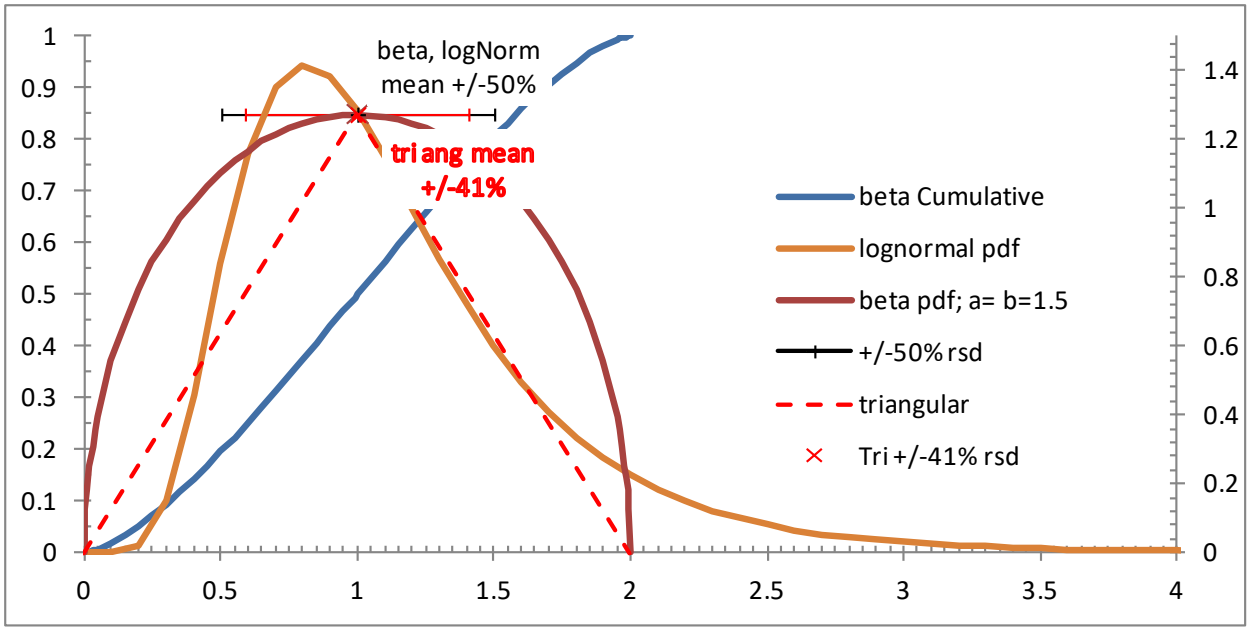

Figure B-1. Generic Beta Representing All Leak Volume Uncertainties

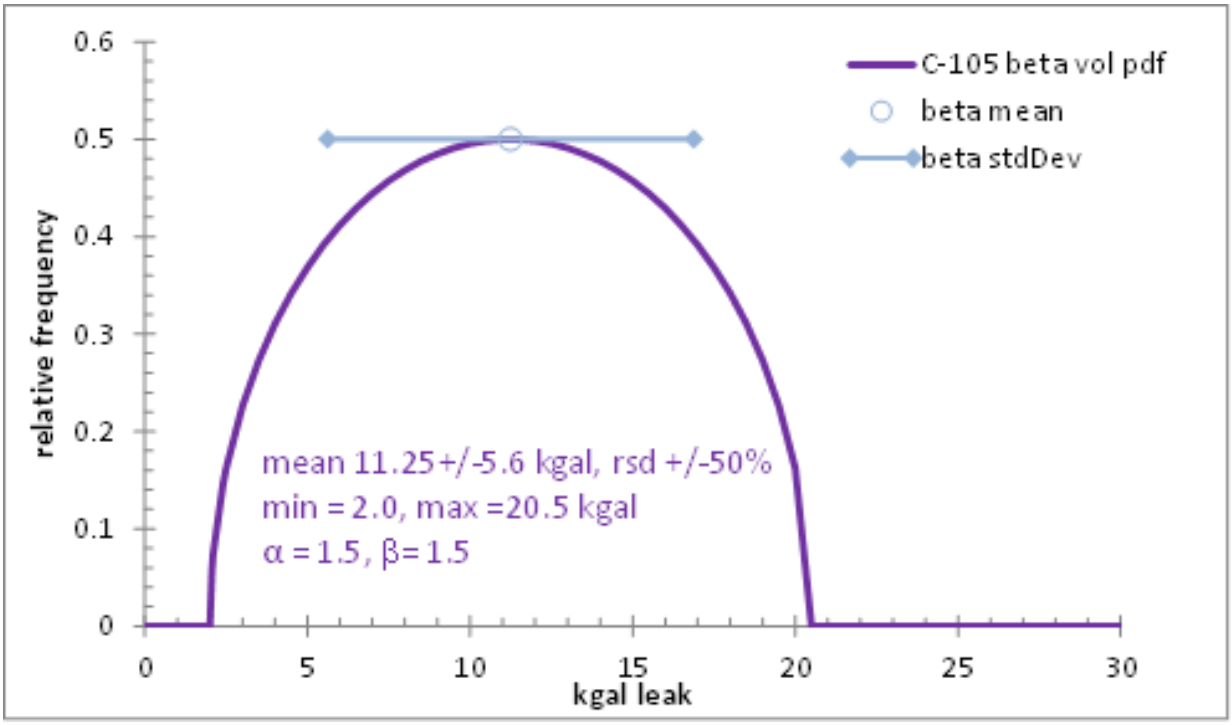

Figure B-2. Generic Beta Representing All Leak Volume Uncertainties from C-105 Tank Leak

A symmetric beta distribution would present the desired range with a continuous function increasing probability towards the end of the range when compared with the triangular distribution. Comparing with the lognormal, the symmetric beta has more central tendency where the most probable value coincides with both the mean and the mode. The lognormal is skewed having the most probable value towards the minimum while presenting very high values at low probability. Thus, the symmetric beta with the shape parameters at $\alpha = \beta = 1.5$ reasonably represents both the range of the leak assessment reports and desired 50% RSD.

As an example, Figure B-3 presents the possible beta distributions for the tank leak C-105. For the reported range 2.0 to 20.5 kgal, the initial symmetric beta distribution (α=1.5, β=1.5) for the tank leak covering this range is shown with a mean value of 11.25 kgal. The tank leak report for the C farm (RPP-ENV-33418 Rev 4) estimated the Cs-137 inventory of the C-105 leak in the range of 4,200 to 42,000 Ci. WMA-C performance assessment has suggested that the Tc-99 in the leak inventory is 9.8 Ci (RPP-RPT-42294), so SIMv2 adjusted the mean volume of the C-105 leak to 17.2 kgal, which corresponds to 10 Ci of Tc-99. Accordingly, the corresponding uncertainty range was increases as shown in Figure B-3.

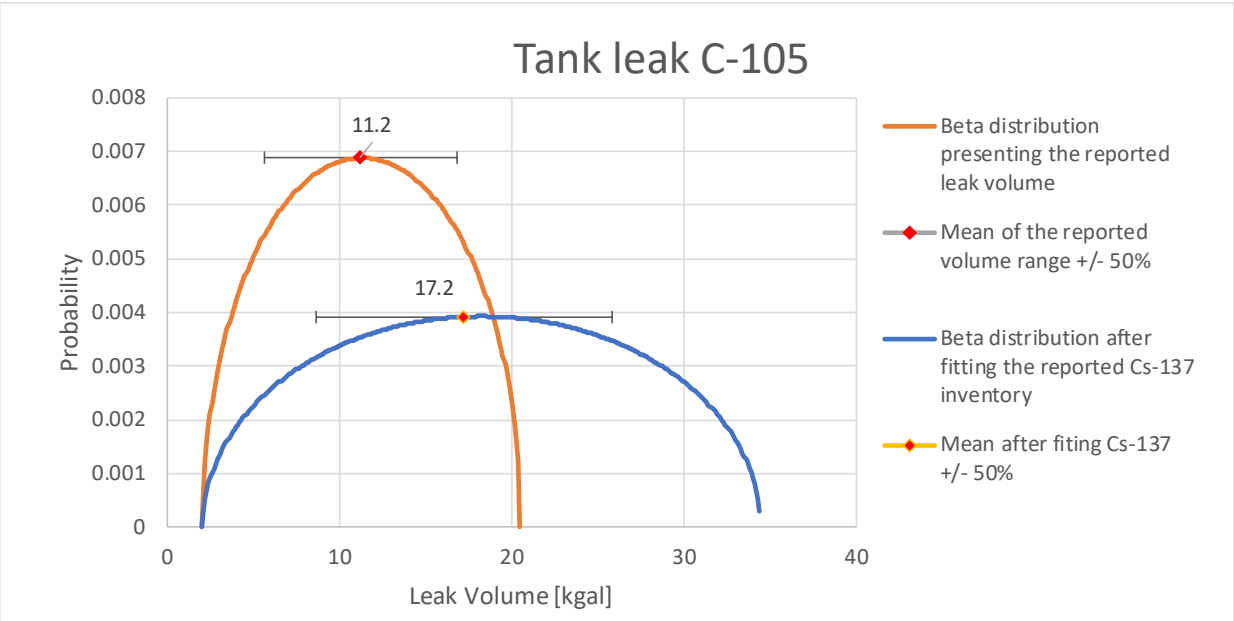

Figure B-3. Possible Beta Distributions for C-105 Tank Leak

The beta distribution adapts well to the many different ranges of minimum, most likely, and maximum that are reported for leak volume uncertainties and so there are many other leak volume uncertainties that could be better represented in some future effort.

B2.3 Tank Leak Information and Results

This section describes the approach for estimating the waste composition in the tank at the time of the leak. It is based on first deriving the supernatant composition using the HDW-SMM vector followed by estimating the uncertainty in Cs-137 inventory in the leak and then comparing it to the value estimated in the leak assessment reports.

For each of the tank leaks considered, the HDW-SMM quarterly results are shown graphically for the Cs-137 concentration. On each figure, the estimated leak times are indicated, along with sample based

concentration information where available decayed to common date of January 1, 2001. The purpose of these graphical presentations is to show the sensitivity of the leak inventory to the assigned leak year. For example, the Cs-137 concentration in C-105 varies by an order of magnitude over the operating history of the tank as shown in Figure B-4. The concentration at one possible leak (in 1968) varies appreciably from estimate of another possible leak time (in 1970). The leak time considered in SIM-v1 is also presented to underscore the possible changes in leak inventory based on timing of leak.

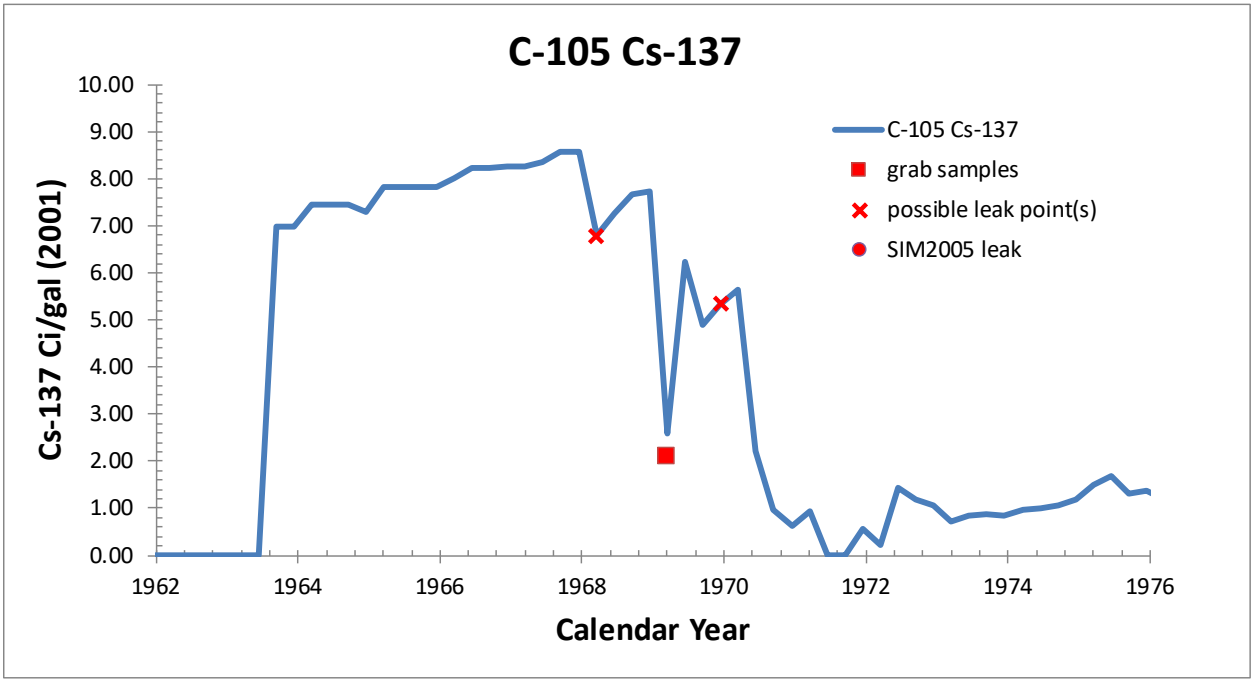

Figure B-4. Possible Leak Variability and Sample Dates for Cs-137 Ci/gal for C-105

The SMMbyQtrs workbook (Appendix E) generates the volume and species inventory histories of any tank liquid or solid. These plots show the Ci/gal Cs-137 concentrations for each tank along with each tank's fill history. This can be quite useful for assigning leak uncertainties since the liquid in a tank can change quite a lot during a suspected leak period.

The leak assessment reports changed a large number of tank leaks listed in Table B-3 and then SIM-v2 sets its 95th percentile to the upper bounds of the range of the tank leak assessment reports for the six tanks noted in Figure B-4. Most of the listed tank leak reports use Cs-137 γ-logging data to estimate the discharged inventory. Therefore, the reported Cs-137 were mainly used to scale the inventory and uncertainty ranges assuming symmetrical beta distribution.

Figure B-5 shows the SIM-v2 estimated Cs-137 means and 5% to 95% ranges along with the leak assessment reported minimums and maximums for all the tank leaks listed in Table B-2. Most of the SIMv2 tank leak Cs-137 means are set by the mean leak volumes of the assessment report.

Because the minimum leak likelihood is rarely zero, one recommended future change would be to use the 5% as the minimum for all leaks. Adjusting the means of all tank leaks so that the 95% agrees with the assessment maximum Cs-137 would also help make this approach more general.

Figure B-6 shows the SIM-v2 leak volume means and 5-95% ranges for the leaked Cs-137 Ci means and uncertainties shown in Figure B-5, along with the tank compositions at the leak times shown by the SMM in Appendix E.

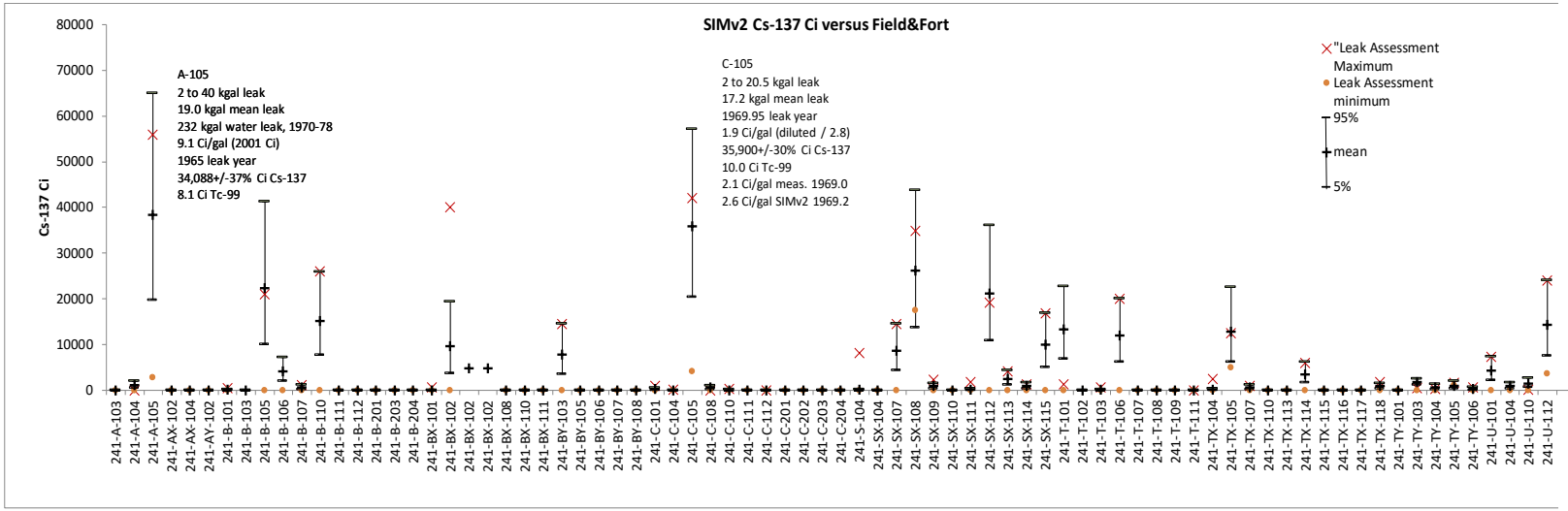

Figure B-5. Cs-137 Ci Tank Leaks with Upper Bounds from SIM-v2 5% to 95%

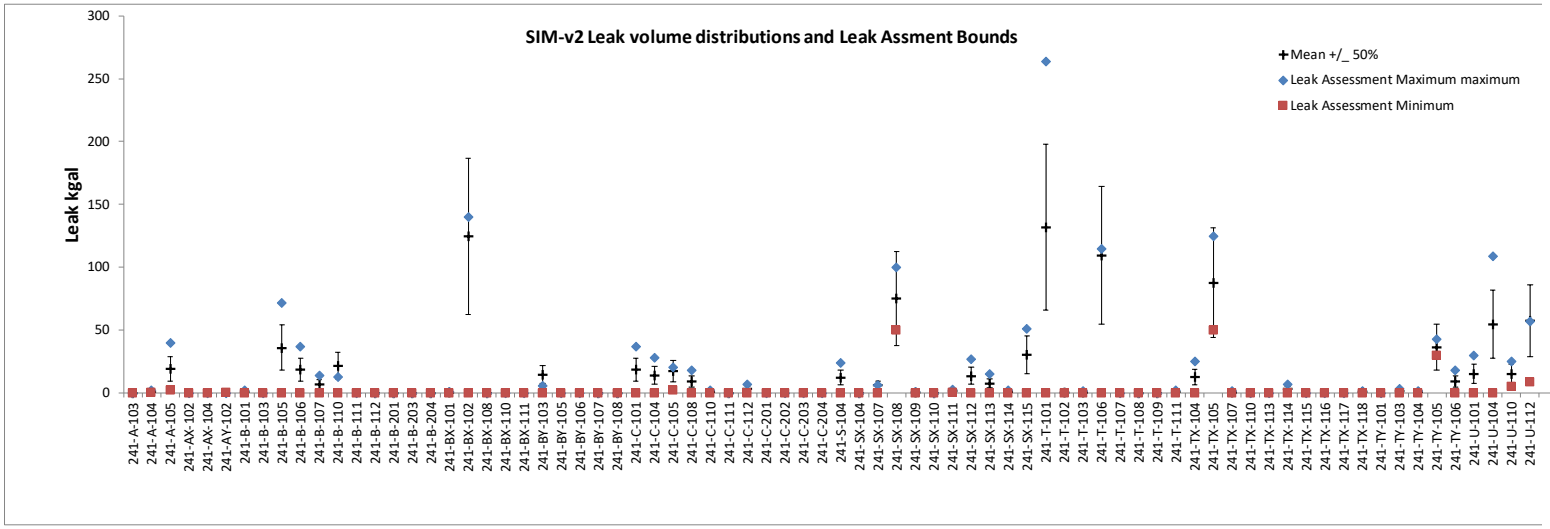

Figure B-6. Kgal Tank Leaks with Upper Bounds from SIM-v2 5% to 95%

The approximately 2 to 40 kgal estimated leak for A-105 occurred between 1963-1970 and was followed by nine years of cooling water additions (1970-78) that resulted in another 232 kgal of leaked volume (RPP-ENV-37956, *Hanford 241-A/AX Farm Leak Inventory Assessment Report*). The SIM-v2 based the inventory estimates on HDW-SMM composition of the tank in 1965. SIM-v2 provides the inventory for an initial 19 kgal leak (an approximate fitted average for 2 to 40 kgal estimated range) as shown in Figure B-7 while Figure B-8 presents the distribution of leak volumes for 1965 (assumed time for 1963-70) and from 1970-78. There were no grab samples for most of the tanks, so Figures B-8 and beyond do not show grab samples.

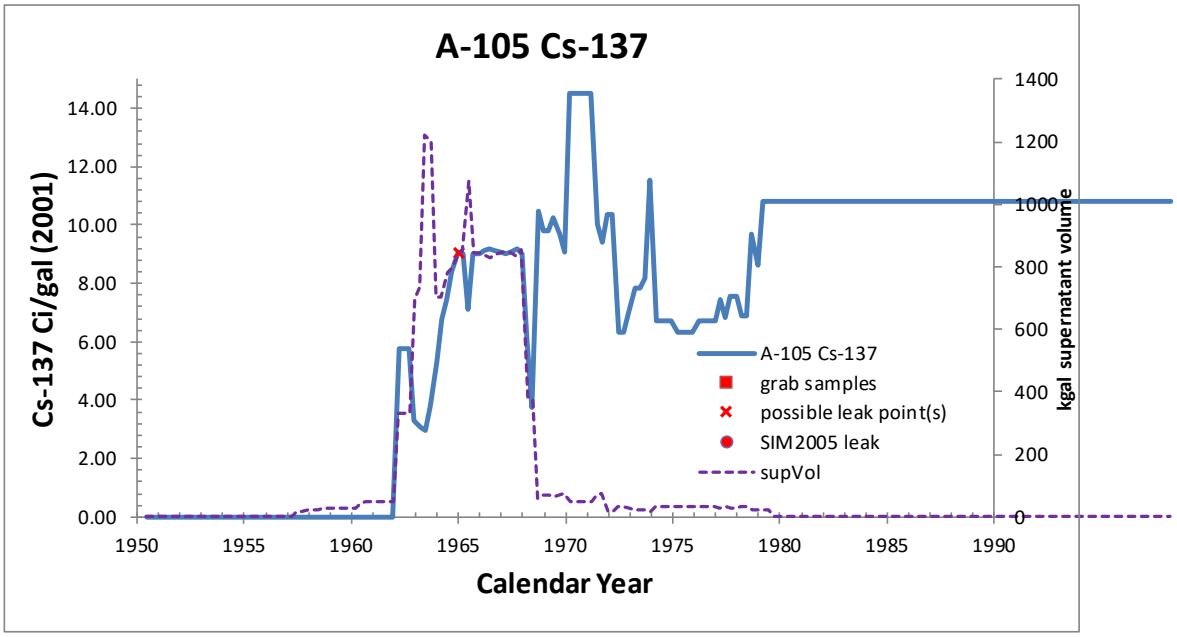

Figure B-7. Cs-137 Ci/gal for A-105 With Large Variability Around Leak Date

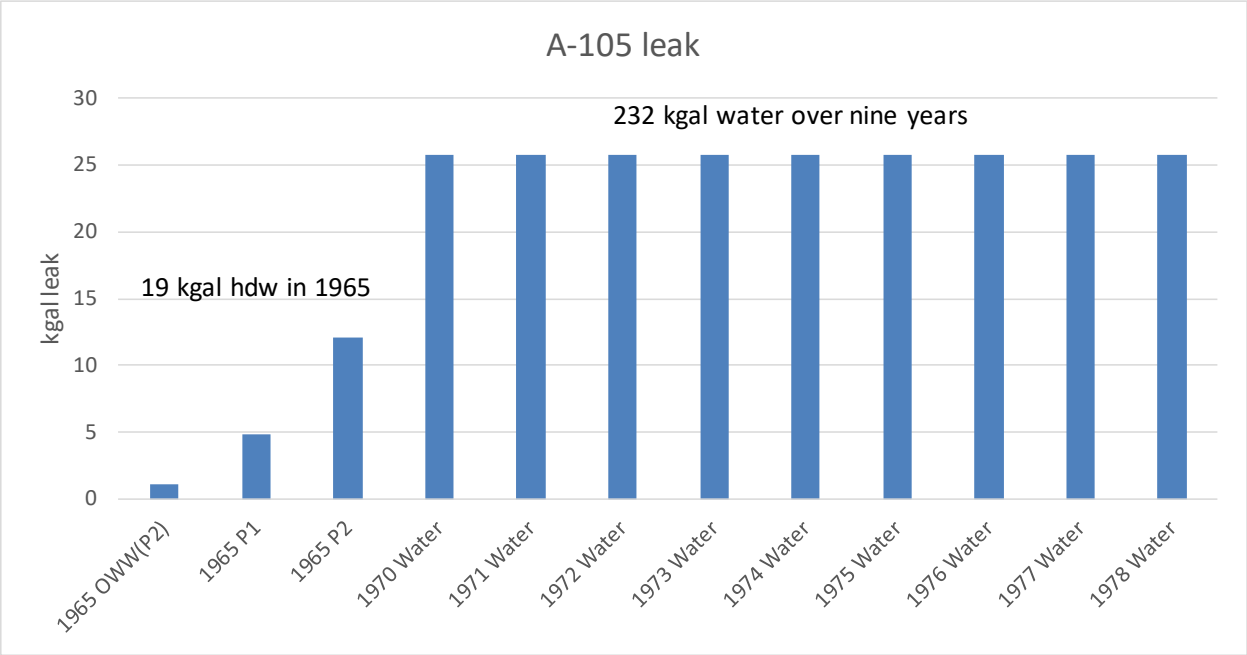

Figure B-8. Distribution of 1965 Leak Volume Over 9 Years

There are 10 new leaks in SIM-v2: B-101, B-103, B-105, B-106, SX-114, T-102, TX-104, TX-105, TX-114, and TX-118, but updated leak assessment reports (Table B-3) set many SIM-v1 leaks to zero. The leak event for B-110 in 1970 was from a measured level lost in the tank of 10 kgal but suggested an upper bound of 13 kgal derived from an upper bound for Cs-137 of 26 kCi, with the assumption of 2 Ci/gal for B-110 at the time of the leak. Setting 26 kCi to 95% of the lognormal distribution of inventory uncertainty (Chapter 6 of the main text), and with the SIM-v2 RSD of 37% gives a mean leak volume of 21.5 kgal and Cs-137 mean inventory of 15.2 kCi. The SMM shows 0.72 Ci/gal for this leak event instead of the 2.0 Ci/gal used in the leak analysis, increasing the mean leak volume.

The B-110 leak is in a class of well-known tank leaks. The B-farm tank leak assessment report (RPP-RPT-49089, *Hanford B-Farm Leak Inventory Assessments Report*) estimated 26,000 Ci of Cs-137 assuming a vadose zone contamination as cylinder of 45 ft radius and depth of 20-100 ft bgs using a maximum soil concentration of 1E-7 pCi/g. The estimated Cs-137 could be revised to a lower value based on waste stream composition at the reported time of the leak. The upper limit of the leak volume was set to 13 kgal in the assessment report assuming 2 Ci/gal Cs-137 in the leak. For SIM-v2 calculations, the mean leak volume is estimated to be 10 kgal based on assessment of tank level drop from 1969 to 1971 (HNF-EP-0182, *Waste Tank Summary Report*). The uncertainty in leak volume is estimated to be 10 kgal +/- 50 % (using a beta distribution), which covers the estimate from the leak assessment report (RPP-RPT-49089). Using the SMM based concentration estimate of 0.7 Ci/gal as shown in Figure B-9, the mean Cs-137 inventory was estimated to be 7,090 Ci. The corresponding Tc-99 mean inventory is 5.8 Ci. It should be noted that matching the Cs-137 maximum at 26,000 Ci with the 95th percentile as shown in Figure B-5 of estimated distribution would lead to almost doubling the Tc-99 inventory mean.

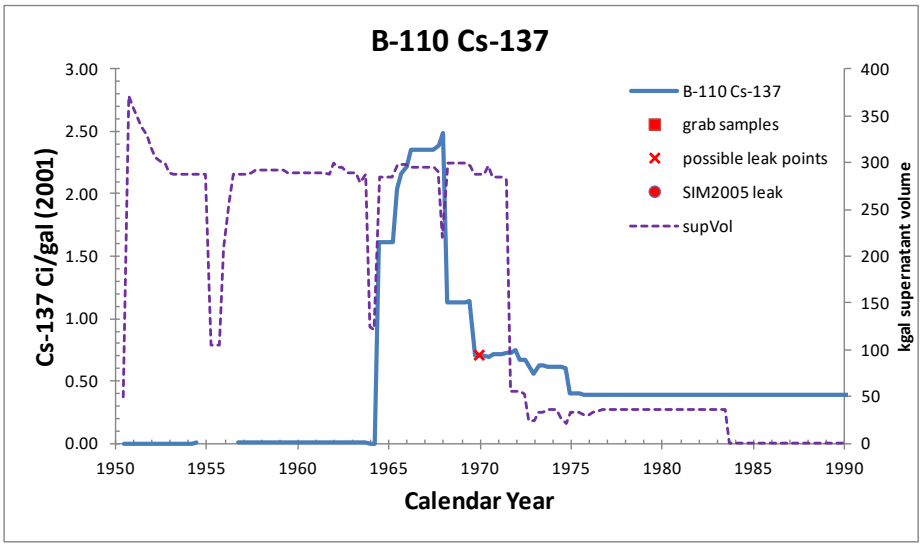

Figure B-9. Cs-137 Ci/gal for B-110 With Large Variability Around Leak Date

The BX-102 leak inventory is discussed here in more detail to demonstrate the need to consider the integration with solubility that are currently beyond SIM-v2 scope. RPP-RPT-47562, *Hanford BX-Farm Leak Assessments Report*, stated the upper estimate for releases from BX-102 is ~140,000 gal, 40,000 Ci of Cs-137 and 20,000 kg of uranium. Further analysis was recommended to analyze two leak events for BX-102. The general approach to estimate leak inventory was applied for the two leak events. However, it was not possible to keep the upper limit of Cs-137 at 40,000 Ci and the estimated uranium at 20,000 kg while keeping the recommended volume within the recommended upper bound. Therefore, earlier notes and reports of the leaks are studied to update estimated inventories.

The upper limit of 20,000 kg uranium estimated in the assessment report can be explained by the high uranium concentration in BX-102 supernatant. In February 1951, an overflow event of 91.6 kgal was reported for tank BX-102 (HW-20742, 1951). On the same note, the tank supernatant samples were taken in the same month of February 1951 and were analyzed for uranyl nitrate hexahydrate (UNH). The sample results average to 59 g UNH/L which is equivalent to ~28 g U/L. The leak was described as overflow from spare inlet nozzles of the BX-102 tank after intentionally over loading it to unplug downstream piping. Such immediate release of the soluble form explains the uranium plume detected and analyzed in the B-BX-BY field investigation report (RPP-10098, *Field Investigation Report for Waste Management Area B-BX-BY*).

It should be noted that the maximum uranium would have been leaked in 1951 when the tank content was mainly MW1 (BT1). As shown in Table B-3, waste streams were defined according to HDW Rev. 5 (RPP-19822), where the uranium solubility limit for MW1 is set at 3.6 g/gal (0.95 g U/L) which is much lower than measured (~28 g U/L). Therefore, the uranium inventories from SIM-v2 for the overflow of BX-102 in 1951 are scaled up by the ratio of measured uranium to the HDW solubility limit as shown in Table B-4.

Table B-3. BX-102 Leak Distribution to Tank Feeding Waste Streams and Normalized Volume Distributions Using HDW-SMM Vector

Assigned waste streams				Volume Beta distribution				SMM	SMM Normalization		
w	site	year	Wst stream	dist type	Parm 1	Parm 2	Parm 3	mean vol f	leak kg	SMM leak vector kgal	sum SMM vector
40	241-BX-102	1951	MW1 (BT1)	9	1.5	1.5	0.693	0.346706	91.60	529.9	529.9
58	241-BX-102	1951	PUREX (P2) Cool Wtr-Stm Cond	9	1.5	1.5	0	0	91.60	0	529.9
213	241-BX-102	1951	WTR	9	1.5	1.5	0	0	91.60	-	529.9
63	241-BX-102	1969	PUREX P1 (P1)	9	1.5	1.5	0.003	0.00148	33.00	5.4	456.6
64	241-BX-102	1969	PUREX P2 (P2)	9	1.5	1.5	9E-04	0.000444	33.00	1.6	456.6
26	241-BX-102	1969	CWP1 (CWP1)	9	1.5	1.5	0.027	0.013615	33.00	49.77	456.6
27	241-BX-102	1969	CWP2 (CWP2)	9	1.5	1.5	0.122	0.060796	33.00	222.24	456.6
56	241-BX-102	1969	PUREX (P2') Org Wst aqu_OWW3	9	1.5	1.5	0.033	0.016374	33.00	59.85	456.6
86	241-BX-102	1969	Sr-Cs Rec Org Wst aqu (P2)_BL	9	1.5	1.5	0.028	0.013797	33.00	50.44	456.6
22	241-BX-102	1969	BYSLT (BT2)	9	1.5	1.5	0.049	0.024416	33.00	89.25	456.6
213	241-BX-102	1969	WTR	9	1.5	1.5	-0.012	-0.006017	33.00	(21.99)	456.6

The Cs-137 was estimated in the leak assessment report (Appendix B2.5 of RPP-RPT-47562) based on presenting the Cs-137 plume as half cylinder that is as large as 20- to 60-ft in diameter while taking the maximum detected concentration of 1E7 pCi/g from 30 to 85 ft depth. Based on γ-logging data in drywells and push holes (Table 2-3 in RPP-RPT-47562) the bounding extent of contamination was deemed extremely conservative. Therefore, the general approach described herein did not apply the reported 40,000 Ci maximum for this tank leak and instead estimated a smaller upper bound which is still within the range of B-BX-BY field investigation report (RPP-10098).

Two separate overflow and leak events were considered for BX-102 as Figure B-10 shows; a first overflow event in 1951 and a second in 1969. In 1951, BX-102 held MW1 waste from the bismuth phosphate process, which had very low Cs-137 at 0.05 Ci/gal but was saturated in uranium. Thus, the 91.6 kgal overflow event released 9,699 kg uranium and 4.9 kCi of Cs-137 as shown in Table B-4.

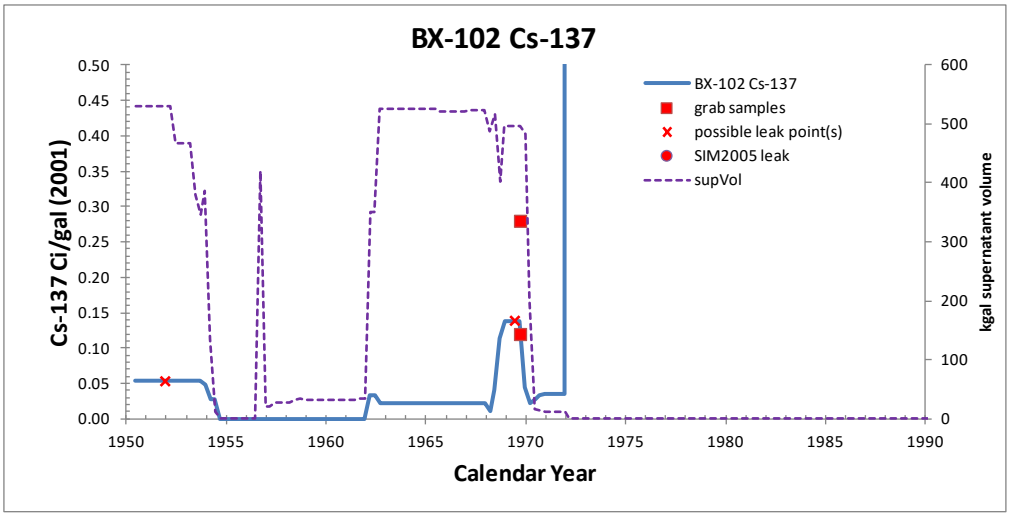

Figure B-10. Supernatant Volume (kgal) and SMM Cs-137 (Ci/gal) for BX-102

Table B-4. SIM-v2 Estimated and Scaled Inventory of BX-102 Leak Events

BX-102 leak	year	statistic	Volume [ML]	Technetium 99 [Ci]	Cesium 137 [Ci]	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	Total U [kg]
1st with HDW solubility limit for	1951	mean	0.347	2.38003182	4851.639	0.00000095	0.00000008	0.10821201	0.00488317	0.00092410	0.110067	
		std	0.173	1.19915708	2444.453	0.00000048	0.00000004	0.05452162	0.00246034	0.00046560	0.055456	
Specific activities Ci/kg U						22361	9.636	6.222	0.00216	0.06467	0.000336	
1st leak scaled for UNH solubility	1951	mean	0.347	2.38003182	4851.639	0.00002781	0.00000246	3.18281478	0.14362745	0.02718027	3.237362	9699.57
		std	0.173	1.19915708	2444.453	0.00001401	0.00000124	1.60363188	0.07236537	0.01369453	1.631115	4887.04
2nd leak	1969	mean	0.125	5.14104758	4805.664	0.00022051	0.01321018	0.00156889	0.00006153	0.00004423	0.001353	4.06
		std	0.035	3.18992555	2665.482	0.00007690	0.00461507	0.00047013	0.00001822	0.00001284	0.000408	1.22
	Total		0.472	7.52107940	9657.303	0.00024831	0.01321265	3.18438367	0.14368898	0.02722450	3.238715	9703.62
											U Std	4888.26

Johnson and Washenfelder (2003) indicated that the second leak volume could be estimated by the observed decrease in the tank volume from 520 to 487 kgal in 1969 with no evidence of any transfers into or out of the tank BX-102. This event leaves an unexplained loss of 33 kgal. Therefore, a second leak event of 33 kgal in 1969 is calculated to have released 4.8 kCi of Cs-137 according to HDW estimated composition of the tank (Table B-1). The concentration at the time of leak (from SMMbyQtrs) is estimated to be 0.14 Ci/gal (decayed to 2001) as shown in Figure B-10, which is consistent with the concentrations in two grab samples reported at 0.12 and 0.28 Ci/gal. The leak analysis report places the Cs-137 upper limit at 40,000 Ci but the SIM-v2 estimate could be used to replace this value (e.g. using the 95%-ile of the evaluated inventory lognormal distribution). The mean inventory of both leaks is 9.7 kCi Cs-137 for 125 kgal total leak mean volume.

There were two possible leak points noted for BY-103 in 1970 and 1973 as shown in Figure B-11, but no volume was reported missing. However, in-tank heaters in the BY farm were evaporating tank liquids from 1965-75, so there were a large number of small transfers along with condensate losses in BY-103. Using soil contamination, the leak assessment (RPP-RPT-43704, *Hanford BY-Farm Leak Assessments Report*) fixes an upper bound to 14.5 kCi of Cs-137 and once again, SIM-v2 uses this as the 95% lognormal given an RSD of 45%, giving a mean leak of 14.3 kgal and 7.9 kCi of Cs-137 for BY-103.

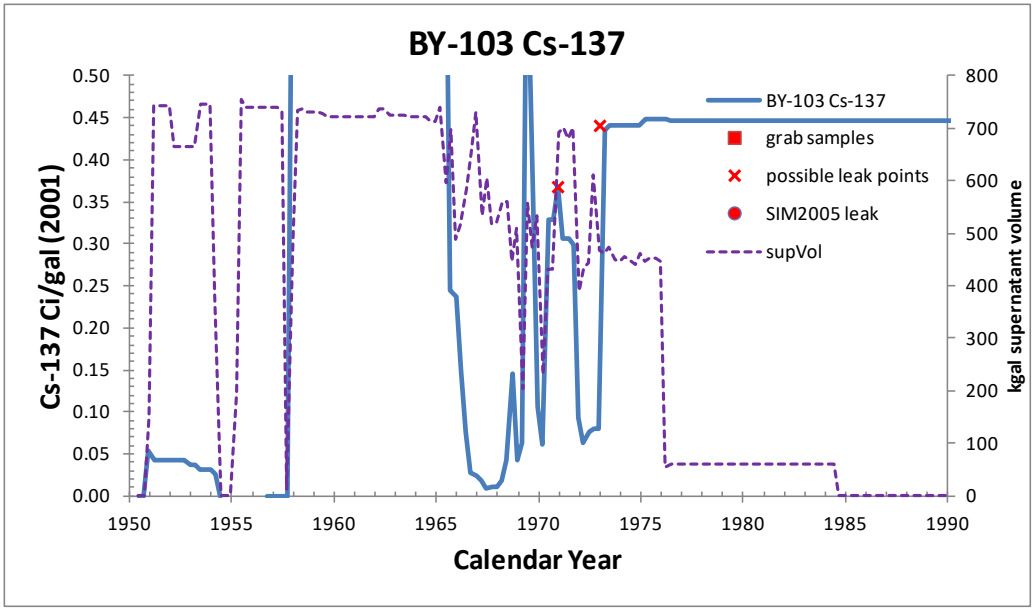

Figure B-11. Cs-137 Ci/gal for BY-103 With Large Variability Around Two Possible Leak Dates

Tank S-104 (Figure B-12) was mainly an R1, CWR1, and CWR2 receiver and the mean leak inventory of 12 kgal is 6.7 kCi Cs-137 with 11.1 kCi at the 95%, consistent with the 8.2 kCi Cs-137 estimated from the soil contamination.

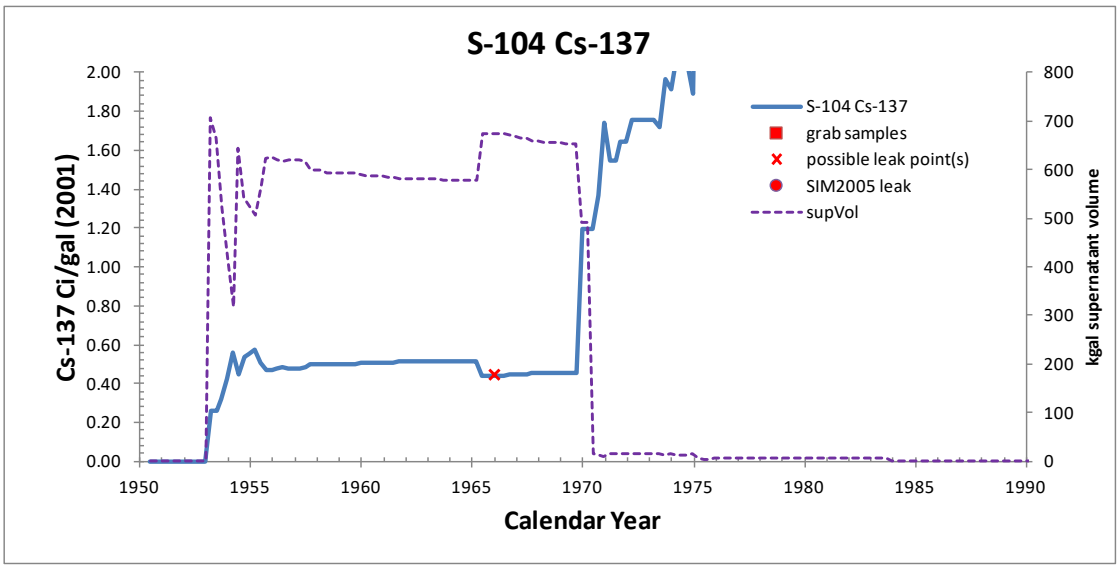

Figure B-12. Cs-137 Ci/gal for S-104 With Minor Variability for the Possible Leak Date

Tank SX-107 (Figure B-13) leak volume comes from setting the estimated Cs-137 soil inventory to the 95th percentile of the inventory log normal, which gives a mean leak of 6.0 kgal. This SIM-v2 mean leak volume agrees with the bounding leak volume in the leak assessment report.

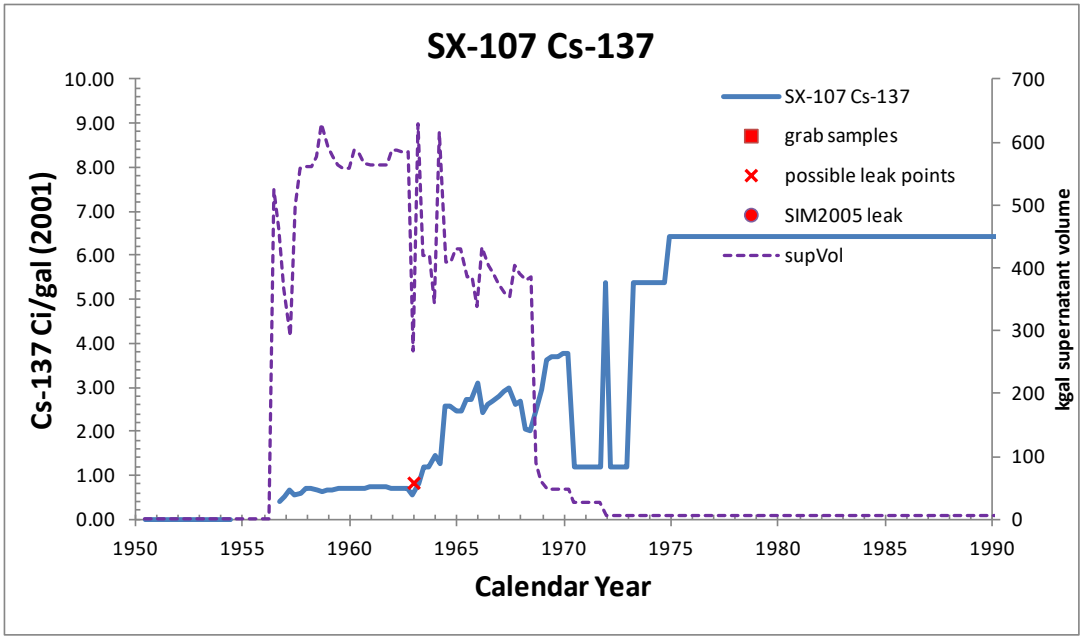

Figure B-13. Cs-137 Ci/gal for SX-107 With Low Cs-137 at Possible Leak Date

Tank SX-108 leaked during a time of very high loading, around 2.5 Ci/gal as shown in Figure B-14. As shown in Figure B-5, the maximum leak Cs-137 falls well within the 95% for the volume assumed.

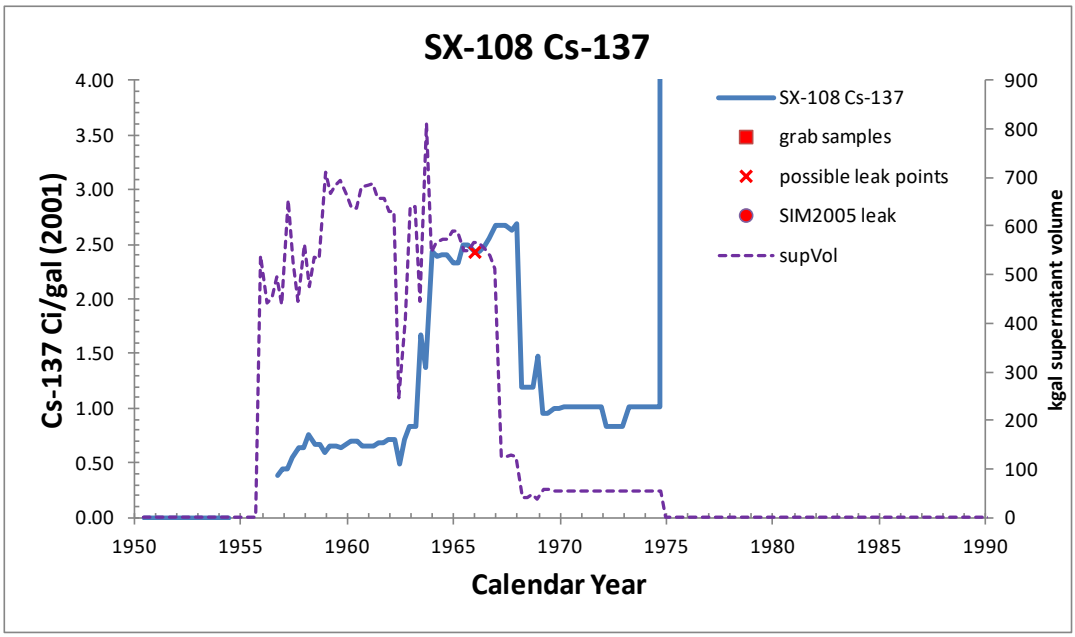

Figure B-14. Cs-137 Ci/gal for SX-108 at Possible Leak Date

The Cs-137 inventory at the SX-112 leak time appears stable at around 1.6 Ci/gal and Figure B-15 shows that there is a good agreement of the selected leak year with the spike in concentration to 2.3 Ci/gal that is followed by emptying of the tank.

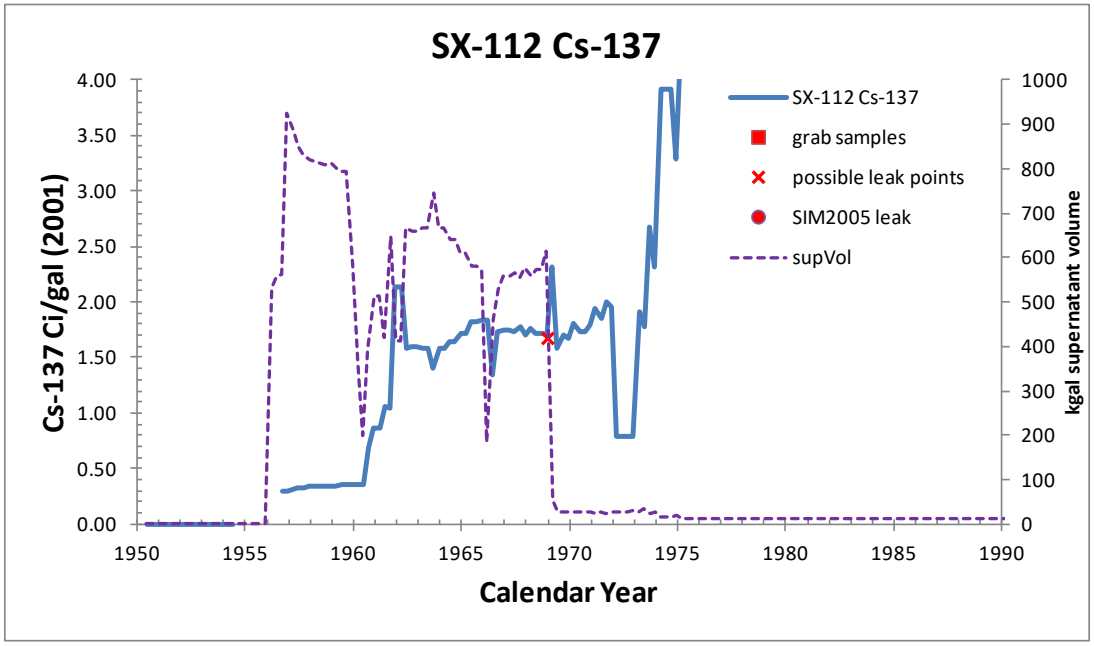

Figure B-15. Cs-137 Ci/gal for SX-112 With Low Variability During Possible Leak Date

Tank SX-115 leak volume in Figure B-16 comes from setting the estimated Cs-137 soil inventory to a 95% log normal, which gives a mean leak of 75 kgal as compared to the bounding leak of 100 kgal in the leak assessment report.

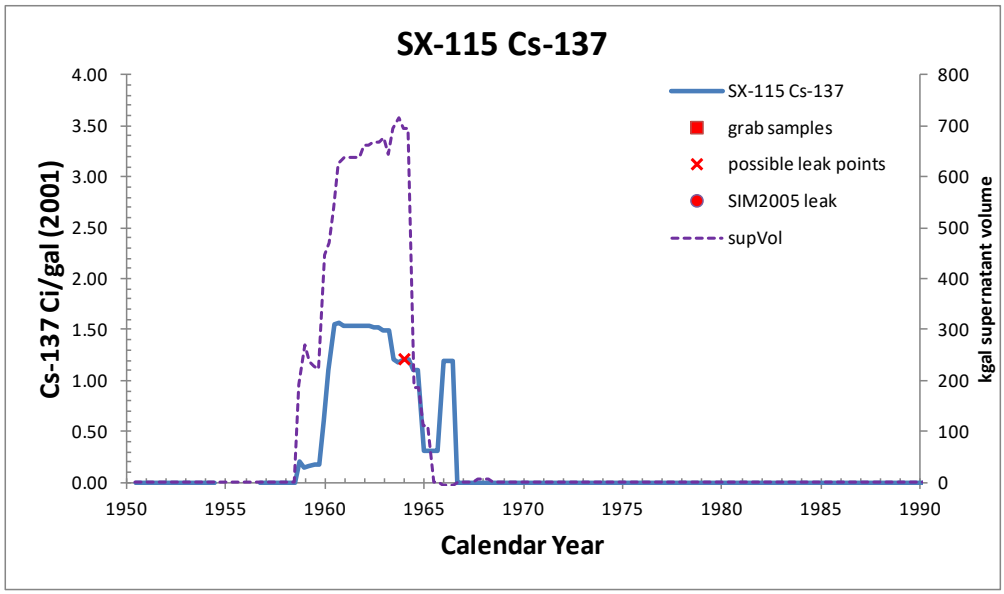

Figure B-16. Cs-137 Ci/gal for SX-115 With Large Variability During Three Possible Leak and Sample Dates

Tank T-106 leak shown in Figure B-17 was discovered in 1979 from extensive dry-well contamination and the leak time assigned to about 1973. The soil column plume extensively studied and resulted in a very good radionuclide inventory although the leak volume was not well known. The T-106 leak is in a class of well-known leak plumes where the bounding Cs-137 inventory is presumed to represent a 95% of the cumulative log normal distribution.

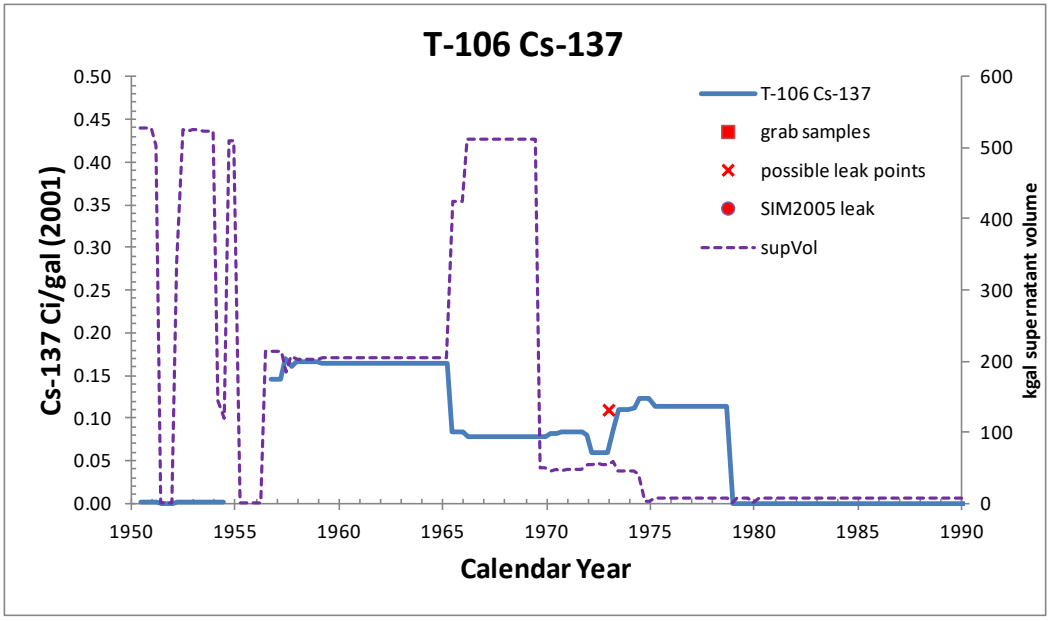

Figure B-17. Cs-137 Ci/gal for T-106 With Variability Around Possible Leak Date

Very large Cs-137 leak inventories occurred for SX-108 and TX-105. TY-104 was incorrectly listed as 2.09e5 Ci in the summary of the assessment report (RPP-RPT-42296). The TY-104 leak of a 1.4 kgal leak at 0.21 Ci/gal, which is 294 Ci, not 209,000 Ci. The very large Cs-137 for SX-108 came from assigning the whole 100 kgal leak to the tank concentrate in 1966, which was 2.4 Ci/gal (decayed to 2001).

Report RPP-ENV-39658 Rev0 stated that the leak amount was estimated based on soil activity, which was 34,900 Ci. The balance of the leak was then presumed to be unaccounted water loss due to evaporation and condensate return for these boiling waste tanks. Therefore SIM-v2 simply adjusted the WATER content of the HDW vector to fit the Cs-137 leak inventory to 34,900 Ci.

For the TX-105 leak, RPP-RPT-50870 Rev0 states that the high U present near the overflow inlet for TX-105 suggests that an overfill event occurred during operations with MW1 and MW2 waste in the 1950s. Setting the leak date to 1952 resulted in a leak inventory shown in Figure B-18 and that appears consistent with the Cs-137 estimate from soil assay. In addition, the U-238 inventory is 0.19+/- 37% Ci U-238 (580 kg U) and so is within one RSD of the reported range of 0.06 to 0.15 Ci of U-238.

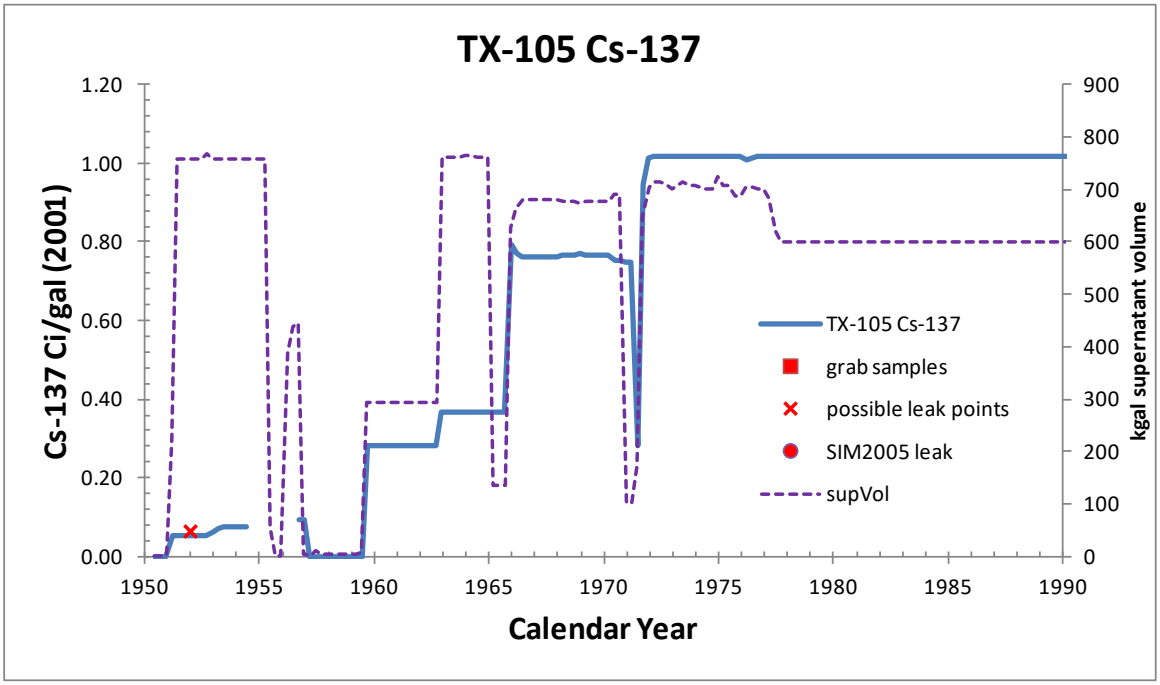

Figure B-18. Cs-137 Ci/gal for TX-105 With Little Variability for Possible Leak Date

Although U-112 leak was discovered in 1969, the leak assessment noted that an overfill event most likely occurred in 1964 as shown in Figure B-19. At that time, the tank was full of a mixture of wastes from early MW1, 1C1 to R1 and CWR1.

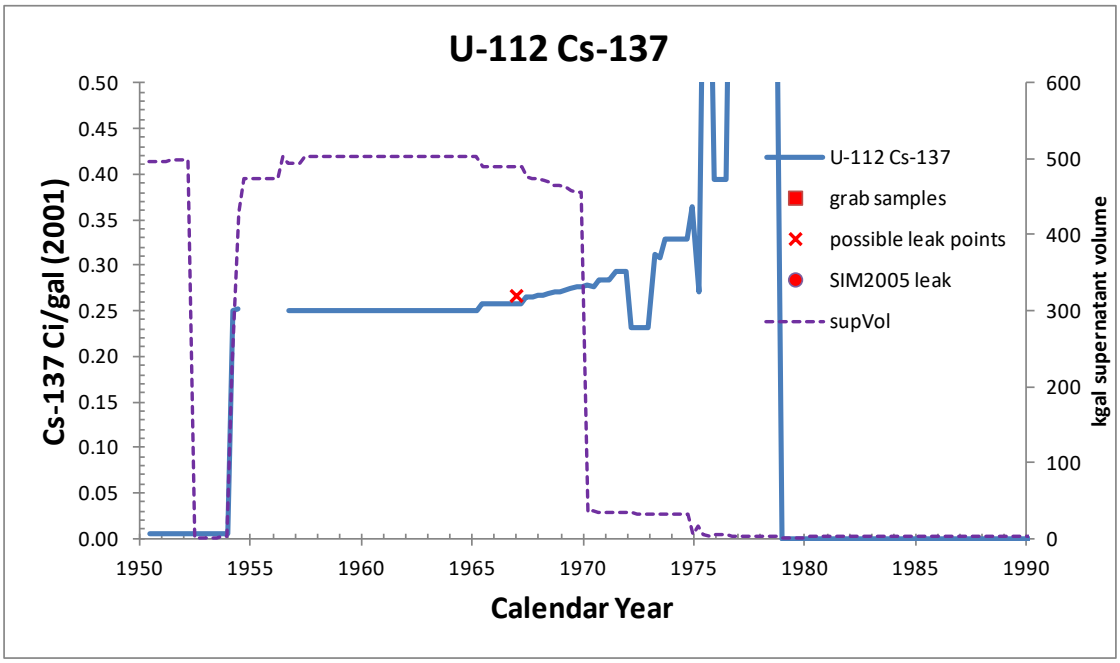

Figure B-19. Cs-137 Ci/gal for U-112 With Little Variability Around Possible Leak Date

Table B-5 presents the uncertainties in Cs-137 tank leak inventories and volume. In general, the SIM-v2 adjusts the leak volume to fit the 95%-tile value of calculated Cs-137 inventory to the maximum value in

the tank leak assessment reports unless there is more qualitative information to reduce the uncertainty (e.g., BX-102, C-105, and A-105).

Table B-5. SIM-v2 Tank Leak Cs-137 Ci and Uncertainty Ranges at Assigned Leak Years

Tank Leak	Mean	5%	95%	Assessment Leak Dates	SIM-v2 Year
241-A-103					
241-A-104	1130	561	1967	1975	1975
241-A-105	38348	19858	65026	1963	1965 and 1970-78
241-AX-102					
241-B-101	112	51	207	before 1974	1974
241-B-105	22397	10168	41175	1978	1978
241-B-106	4109	2073	7083	1978	1978
241-B-107	664	353	1108	1969	1965
241-B-110	15243	7895	25843	before 1970	1970
241-B-112					
241-B-201					
241-B-203					
241-B-204					
241-BX-101	6	3	10	before 1972	1972
241-BX-102	9657	3770	19330	1951 and 1969	1951 and 1969
241-BX-108					
241-BY-103	7903	3588	14530	1969	1973
241-BY-107					
241-BY-108					
241-C-101	290	154	484	1965	1965
241-C-104	26	14	44	~1965	1965
241-C-105	35940	20553	57072	1974	1972
241-C-108	618	328	1032	~1965	1965
241-C-110	34	16	63	NA	1969
241-C-111					
241-C-112	6	3	11		1970
241-C-201					
241-C-202					

Table B-5. SIM-v2 Tank Leak Cs-137 Ci and Uncertainty Ranges at Assigned Leak Years

Tank Leak	Mean	5%	95%	Assessment Leak Dates	SIM-v2 Year
241-C-203					
241-C-204					
241-S-104	6684	3562	11126	1966	1966
241-SX-104					
241-SX-107	8614	4512	14500	1964	1963
241-SX-108	26181	13834	43822	1962	1963
241-SX-109	908	477	1527	1965	1966
241-SX-110					
241-SX-111	170	89	287	1974	1974
241-SX-112	21241	10971	36079	1969	1969
241-SX-113	2543	1355	4233	1958	1958
241-SX-114	951	497	1603	1972	1965
241-SX-115	9970	5213	16800	1965	1965
241-T-101	13346	6911	22631	1969	1969
241-T-102	29	15	48	na	1974
241-T-103	78	41	131	1973	1973
241-T-106	11946	6310	20000	1973	1973
241-T-108					
241-T-109					
241-T-111	0	0	0	1974	1971
241-TX-104	1504	803	2501	1954	1954 and 1965
241-TX-105	12814	6282	22491	1952?	1952
241-TX-107	658	325	1151	1975	1975
241-TX-114	3557	1755	6219	before 1974	1974
241-TX-118	889	439	1555	before 1973	1977
241-TY-101					
241-TY-103	1832	1331	2437	1973	1973
241-TY-104	712	351	1245	1974	1973
241-TY-105	1053	478	1936	1960	1960
241-TY-106	368	167	677	1959	1959

Table B-5. SIM-v2 Tank Leak Cs-137 Ci and Uncertainty Ranges at Assigned Leak Years

Tank Leak	Mean	5%	95%	Assessment Leak Dates	SIM-v2 Year
241-U-101	4382	2335	7295	?	1959
241-U-104	1034	553	1718	1953	1953
241-U-110	1472	730	2566	1975	1975
241-U-112	14419	7684	24000	1969	1964

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Appendix C

Z Area Updates

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Terms

COC	contaminants of concern
COPC	contaminants of potential concern
HDW	Hanford-defined waste model
HSW	high salt waste
LSW	low salt waste
PRF	Plutonium Reclamation Facility
SIM	Hanford soil inventory model
SIM-v1	original SIM implementation in 2005
SIM-v2	updated SIM implementation in 2017
WIDS	Hanford Waste Information Data System

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C1 Introduction

Several Z Area updates were made after review of the Z Area documentation to include SIMv2. Plutonium and other actinides are important long-term risk drivers and the Z Area SIMsites have large amounts of contaminants of potential concern (COPCs). In addition, carbon tetrachloride in the vadose and groundwater are contaminants of concern (COCs) and originate almost completely from the Z Area. The changes in Z Area SIMsites have more to do with how the chemical COPCs and not the radionuclide inventories like Pu changed. For example, there was much documentation for the Z Area for high salt and low salt wastes that SIMv1 did not include. Several complex waste flows from disposal trenches Z-1D, Z-11, and Z-19 into the U-10 pond that SIMv1 did not capture, and other sedimentation tanks preceding crib disposals were likewise not clearly described in SIMv1. This appendix describes 23 variations of SIMwastes in the Z Area, nine unique SIMwastes along with three different campaigns (BT1, Z1, Z2) for most of the 23 SIMwastes that make up the SIMsite Z Area inventories.

C1.1 History

Operations over the history of the Z Area (HNF-EP-0924, *History and Stabilization of the Plutonium Finishing Plant (PFP) Complex, Hanford Site*) produced metal "buttons" from a variety of sources of plutonium. Primary Pu sources were solutions from each extraction facilities at Hanford. Secondary Pu was recycled or recovered from scrap and other wastes from the processes shown in Figure C-1 that resulted in three wastes: high salt waste (HSW)-aqueous (aq), HSW-organic (org), and low salt waste (LSW). There were both organic (i.e., CCl4 and aq] wastes) from various Z Plant processes described elsewhere (12820-89-LHR-001, "Waste Characterization of Plutonium Finishing Plant Waste to 241-Z").Tertiary Pu was recovered along with Am from the CAW stream during a limited campaign with ion exchange resins (PuAmRec).

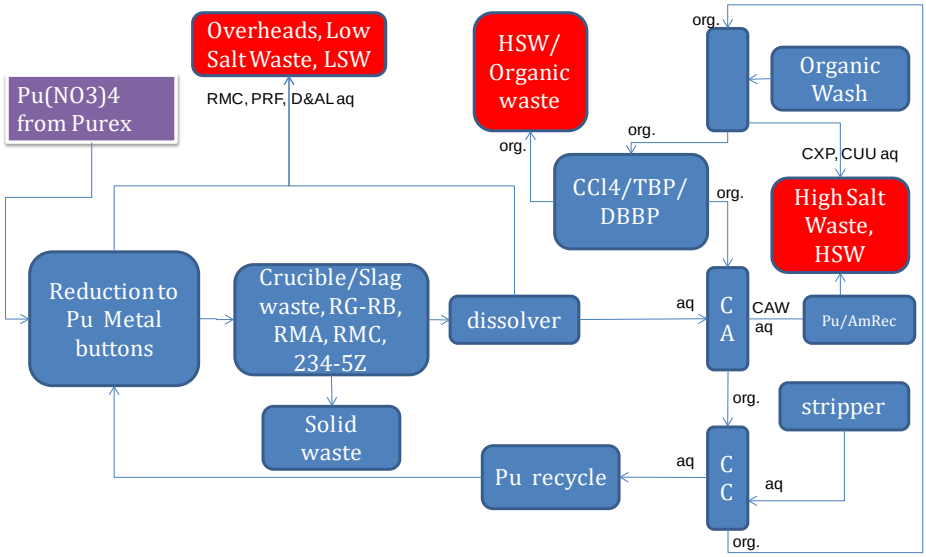

Figure C-1. Diagram of Z Plant Processes

The Z Area production scaled with the total burnup of fuel (expressed as GWds/year; Figure C-2), and the wastes that Z operations produced were proportional to this production curve. In addition, Figure C-2 shows variability (as an error bar) for this production in GWd per batch of fuel processed over each year. About 1,200 batches of fuel were processed over the history of Hanford operations, and the batch-to-batch variability burnup represents a fundamental uncertainty in the partitioning of radionuclide inventories among SIMwastes. Each Hanford-defined waste (HDW) model represents the sum of all

batches processed in a given campaign such as P1 in Figure C-2. The campaign HDW radionuclides will vary over the many tank transactions and SIMv2 uses the batch variability within a campaign to represent the uncertainty of radionuclides in any waste volume. Although the burnup for each batch has a low uncertainty, the radionuclides in each batch processed during a campaign varied as shown.

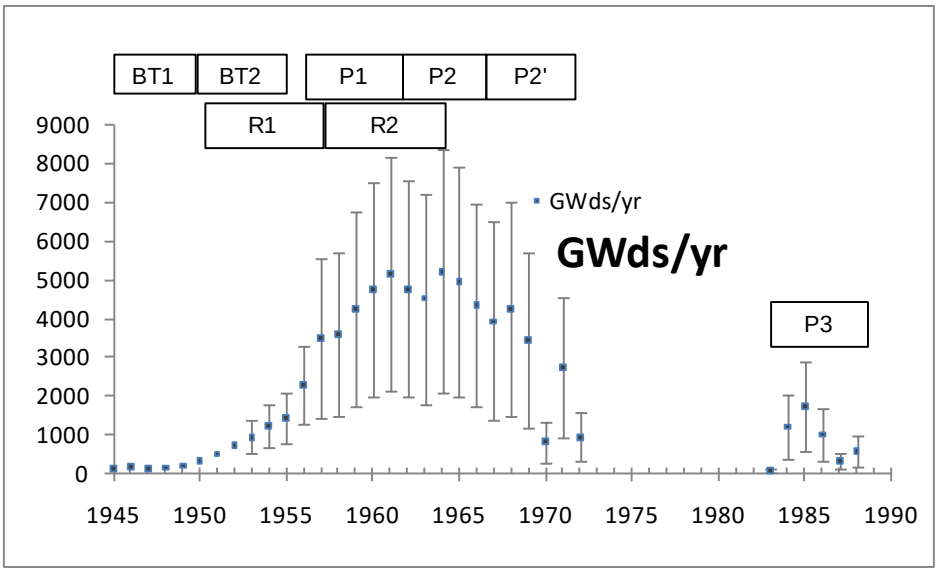

Figure C-2. Z Plant Feed Pu Reactor Production (1945-1990)

C1.2 SIMwastes

The Z Area SIMwastes were nearly all released to the soil column and Figure C-3 shows Z Area SIMsites as cribs, french drains, closed trenches, open trenches, and settling tanks, as Figure C-3 and the U-10 open pond or swamp in Figure C-4.

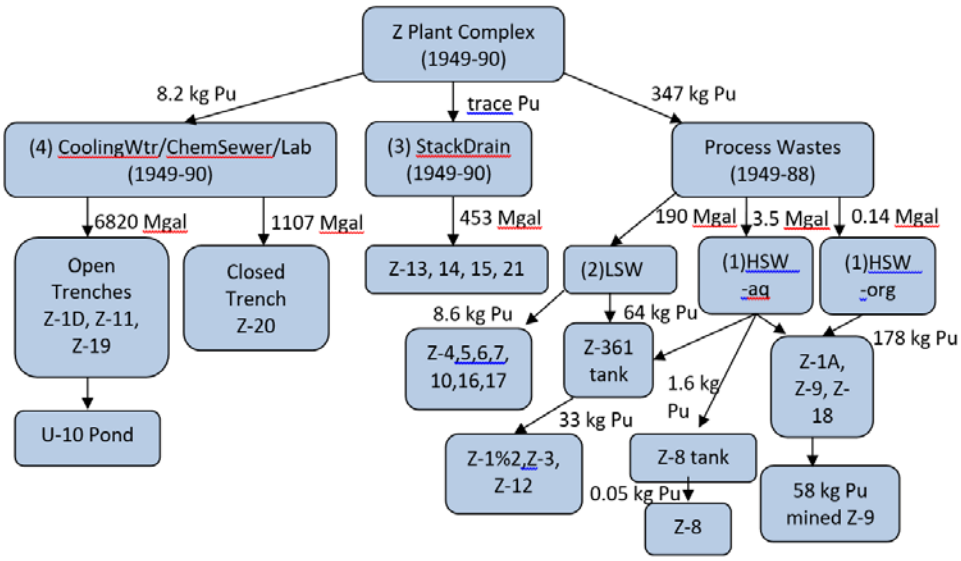

Figure C-3. Z Plant Complex Logic and Waste Flows

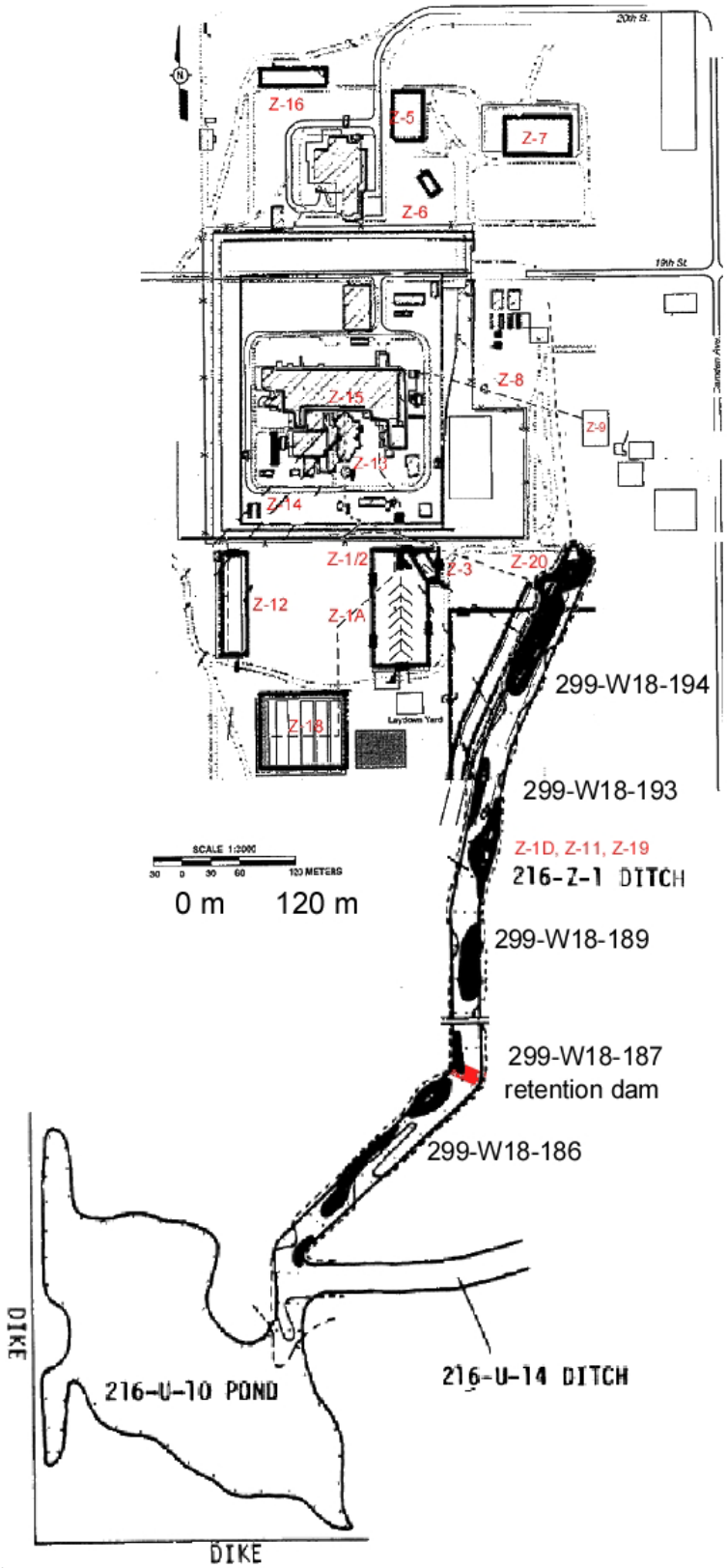

Figure C-4. Diagram of Z Area Facilities and Components

C1.3 Conceptual Model

Figure C-3 shows Z Plant waste streams broadly categorized into three primary groups: process wastes that originated from both the metal production lines (LSW) and solvent extraction processes used to recover plutonium (HSW-aq and HSW-org); stack drainage from the main stack and HVAC systems with trace contaminants; and cooling water and chemical sewer waste streams with lower amounts of contaminants compared to the process streams.

The Z Plant discharged waste streams to separate waste-disposal sites (Figures C-3 and C-4 (in a simplified manner) according to these designations. The HSW and LSW process wastes are responsible for the vast majority of chemical and radiological contaminants discharged to the soil column. These wastes had different SIMsites compared with the SIMsites for Cooling Water /ChemSewer/Lab wastes, which have by far the most volume. The presentation of waste streams generated and disposed in Figure C-3 is simplified compared to the actual handling and disposal. Several different types of HSW and LSW streams were generated reported elsewhere (12820-89-LHR-001) and disposed at various waste sites, sometimes with both HSW and LSW routing to the same crib leading to a more complicated representation of actual disposed amounts. Understanding these complex histories and developing a conceptual model results in the updates of SIMv2 inputs.

A timeline from 1947-1992 of HSW and LSW SIMwastes resulted from six Z Plant processes: recuplex Z1, Plutonium Reclamation Facility (PRF) Z2/AmRec, PRF Z2, RMA, EMC, and RG-RB along with the various SIMsites that were used for disposal of those wastes. The Z Plant HSW and LSWs went to various SIMsites detailed in Appendix G, and those Z Plant wastes went to tank farms after 1992. Note that the crib Z-1%2 was used mainly for LSW but also had some HSW sent to it through the Z-361 settling tank, but no spent organic waste, HSW-org. The wastes sent to the cribs represented large volumes, much of which accumulated in the U-10 pond before 1980 (Figure C-5). A detailed timeline for the disposal of large volumes of CoolingWater /ChemSewer/Lab wastes are shown among four trenches: Z-1D, Z-11, Z-19, and Z-20.

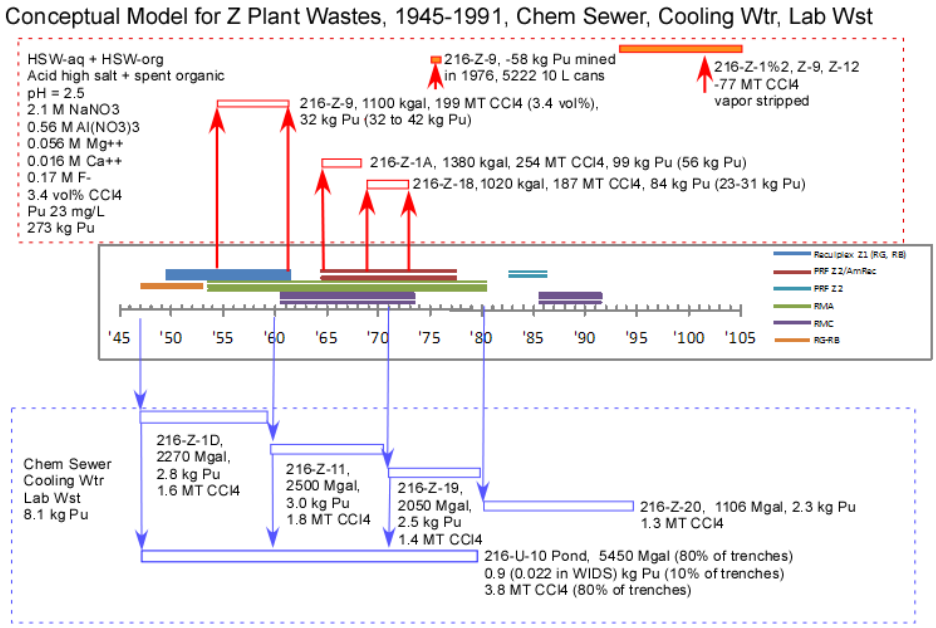

Figure C-5. Conceptual Model for Z Plant Operations

Each of the three trenches (Z-1D, Z-11, and Z-19) were open and flowed directly into U-10 pond (Figure C-4). These trenches were somewhat confused with U-10 in SIMv1, which did not document its assumptions well about the partitioning of liquids and Pu solids among the trenches and U-10 pond. Despite indications in SIMv1, there were no Z wastes discharged directly to U-10 pond.

The SIMv2 therefore first shows additions to the three trenches followed by events that move some fraction of those wastes from the trenches to U-10 pond. Thus, SIMv2 assumes 99% of Pu along with 20% of the liquids discharged to the unlined Z-1D, Z-11, and Z-19 were absorbed in those trenches with the balance moved to U-10 pond (D&D-30349, *Study of Liquid Effluents and CERCLA Hazardous Constituents Generated and Discharged by the Plutonium Finishing Plant*). The SIM-v1 did not route any wastes to Z-1D, Z-11, and Z-19 trenches and instead routed these disposals directly to U-10 pond. As Figure C-4 shows, waste flowed several hundred meters in these unlined trenches before entering U-10 pond.

C2 Z Plant Waste Types

The operations in Z Plant were complex and varied over time. There are a number of recuplex waste stream descriptions, but the most complete are those provided in 12820-89-LHR-001, by which time HSW and LSW Z Plant wastes were neutralized, combined, and disposed to the tank farms and not the soil column in 1989. Nevertheless, these flowsheet compositions apply to the previous campaigns before 1973 disposal to the tanks as well.

C2.1 High and Low Salt Aqueous Waste (HSW-aq and LSW)

The aqueous HSWes and LSWes are described in detail (12820-89-LHR-001), and the flows for each stream specified along with compositions are shown in Table C-1. The CAW stream is the highly acidic waste from the PRF extraction column (CA column) and contains RMC concentrated filtrate, dissolved oxide, and slag and crucible feeds. Back extraction of the Pu occurs in the CC column and the organic stream is cleanup up by CUU and CXP solutions and reused. When the organic stream could no longer be cleaned up, it was disposed to the same HSW cribs as CAW.

Table C-1. Flowsheet Compositions for Various Z Plant Unit Processes

		HSW			LSW			
	Compound	**PRF CAW**	**PRF CXP**	**PRF CUU**	**RMC "HSW"**	**PRF**	**RMC**	**D&AL**
mols/L	L/hr	158	18	20	25	25	66	20
at./m.w.	g/cm^3	1.18	1.05	1.05	1.27	1.06	1.03	1.01
26.98154	Al	0.7						
137.327	Ba	5.00E-06	1.00E-06			0.000004	0.000001	2.00E-07
40.078	Ca	0.02	0.00003			0.0001	0.00006	0.000007
51.9961	Cr	0.002	2.00E-07	2.00E-07		2.00E-07	2.00E-07	2.00E-07
55.847	Fe	0.001	0.000036			0.0002	0.00007	0.000008
1.00794	H	2.6		0.4		2	0.08	1.00E-01
39.0983	K	0.001			6	0.005	0.003	
24.305	Mg	0.07	5.00E-06	0.000005		0.00002	0.00001	1.00E-06

Table C-1. Flowsheet Compositions for Various Z Plant Unit Processes

		HSW			LSW			
	Compound	**PRF CAW**	**PRF CXP**	**PRF CUU**	**RMC "HSW"**	**PRF**	**RMC**	**D&AL**
mols/L	L/hr	158	18	20	25	25	66	20
at./m.w.	g/cm^3	1.18	1.05	1.05	1.27	1.06	1.03	1.01
54.93805	Mn	0.001	1.00E-06			0.003	0.005	4.00E-07
22.98977	Na	0.03	0.92	0.005	1	0.006	0.005	0.004
58.6934	Ni	0.0008	2.00E-07	2.00E-07	2.00E-06	2.00E-07	2.00E-07	2.00E-07
207.2	Pb	0.0005	0.0005					
87.62	Sr	0.00003	4.00E-07			0.000001	7.00E-07	9.00E-08
17.00734	OH		0.005		2			
60.0092	CO_3		5.00E-01		0.02			
35.4527	Cl	0.01	0.0001	0.0001	0.3	0.006	0.001	0.0003
18.9984	F	0.2	0.06	0.07	3			
126.9045	I							
62.00494	NO_3	4.8	0.4	0.4		2	0.8	0.02
46.00554	NO_2	0.009	0.001	0.001		0.01	0.01	0.0003
94.97136	PO_4	0.0002	0.00002	0.00002		0.00009	0.00004	0.000004
96.0636	SO_4	0.002	0					
153.8218	CCl_4	5.00E-04	0.00005	0.00005		0.00002		
17.03056	NH_3	0.01	0					
266.3177	TBP	0.02	0.02	0.02				
74.1228	C_4H_9OH	0.0002	0			0.008		
	DBP	0.00023	0.004					
	MBP							
12.011	TOC	0.25	0.333333	0.25		0.033333		
60.0843	SiO_2	0.0018						
239	Pu g/L	0.009	0.06	0.02	2.00E-06	0.003	0.007	0.00001
241	Am g/L	0.001		0.003		0.001	0.001	0.00001
238	U g/L	0.001		0.02			3.00E-06	

Reference: 12820-89-LHR-001, "Waste Characterization of Plutonium Finishing Plant Waste to 241-Z."

Normally CAW, CUU, and CXP collected, were neutralized to pH=2 and disposed to the HSW cribs prior to 1973. The LSW streams listed were combined and disposed to LSW cribs prior to 1973. The resultant HSW and LSW streams are shown in Table C-2 and compared with an earlier description of HSW and LSW for 1969 (Upington, 1970, "Chemical Discharges to Ground from UO_3 Plant and 234-5 Building"). The amounts of Pu that were discharged to each waste stream were measured and accounted by assay. For unknown reasons, this accounting method usually understated the actual amounts of Pu that were discharged (HNF-31792, *Characterization Information for the 216-Z-9 Crib at the Plutonium Finishing Plant*). For example, the Pu concentration varies from 14.8 to 8.6 mg Pu/L for HSW between 12820-89-

LHR-001 and Upington (1970), but the amount of Pu actually sent to Z-9 has been determined well (HNF-31792) and is actually consistent with an HSW Pu concentration of 23 mg Pu/L, which is 2 to 3 times greater than either flowsheet noted. This totals 90 kg Pu sent to Z-9 some 58 kg of which was removed or mined in 1976 and is stored at the central waste complex (HNF-37473). Because the Pu accounting to Z-9 is the only certain crib, all HSW is set to this same Pu, 23 mg Pu/L and the Am-241 fraction is set proportionately.

Table C-2. HSW and LSW Compositions [a]

	HSW		Upington HSW '69	LSW		Upington LSW '69
	196 L/hr 1.15		207 kgal 1.19	1115 L/hr 1.08		1,699 kgal
Compound	M	ppm	ppm	M	ppm	ppm
Al	0.564286	13,184	10,254			15
Ba	4.12E-06	0		1.52E-07	0.019	
Ca	0.016125	560	995	5.92E-06	0.2	50
SIM Ca		1,748			0.22	
Cr	0.001612	73		1.99E-08	0.001	
Fe	0.000809	39		8.77E-06	0.5	
H	2.136735	1,865		0.051	48	
K	0.000806	27	308	0.135	4,895	
Mg	0.05643	1,188	1,372	1.06E-06	0.024	20
Mn	0.000806	38	42	3.63E-04	19	2
Na	2.377918	47,340	26,331	0.023	489	1,150
Ni	0.000645	33		6.47E-08	0.004	
Pb	0.000449	81				
Sr	2.42E-05	2		6.55E-08	0.005	
OH	0.000459	7		0.045	708	
CO_3	0.045918	2,386		0.00045	25	
Cl	0.008081	248		0.0069	228	
F	0.173878	2,861	644	0.067	1,187	950
I						
NO_3	3.946939	211,925	156,108	0.093	5,329	3,101
NO_2	0.007449	297		8.21E-04	35	
PO_4	0.000165	14		4.46E-06	0.39	
SO_4	0.001612	134				
CCl_4	0.000413	55	3184	4.48E-07	0.06	
NH_3	0.008061	119				
TBP	0.02	4,612				
C_4H_9OH	0.000161	10		1.79E-04	12	
DBP	0.000553	0	3639			
MBP	0	0				

Table C-2. HSW and LSW Compositions [a]

Compound	HSW		Upington HSW '69	LSW		Upington LSW '69
	196 L/hr 1.15		207 kgal 1.19	1115 L/hr 1.08		1,699 kgal
	M	ppm	ppm	M	ppm	ppm
TOC	0.257653	2,680		7.47E-04	8	
SiO_2	0.001451	75				
Pu mg/L	14.806			0.18		
Am mg/L	1.112			0.082		
Pu mg/L	22.7 [b]			0.35 [b]		
Am mg/L	0.47 [b]			0.0074 [b]		
U g/L	0.002847	587	149	1.78E-07	0.039	
Hg		30.1 [c]	29.2 [c]		0.018 [d]	

a. From weighted sums in Table C-1.
b. SIM assignments, see text for details.
c. Upington, 1970, "Chemical Discharges to Ground from UO_3 Plant and 234-5 Building."
d. 216-Z-7 assay C4183 and settling tank 242-Z-361 inventory.

C2.2 High Salt Waste Organic (HSW-org)

The organic solvent used during PRF operations was a mixture of carbon tetrachloride, tributylphosphate, and dibutylbutylphosphonate. The amounts of these species disposed to the HSW organic crib sites has been described elsewhere D&D-30349, and Table C-3 shows those reported amounts. Although a range of inventories were reported for Z-9, SIMv2 fixes Z-9 CCl_4 to an average 3.1 vol% CCl_4 that is consistent with amounts reported to have been disposed to Z-1A and Z-18.

Table C-3. Carbon Tetrachloride Distribution Among Z Soil Disposal Sites

Crib	Waste Type	Total aq+org kgal	kgal ORG	CCl_4 mT	References
Z-1A	HSW-org	1,380	184	254	WIDS-2012, 3.1 vol%
Z-9	HSW-org	1,080	125	199	Proportional to Z-1A, Z-18
Z-18	HSW-org	1,020	115	187	WIDS-2012, 3.1 vol%
Z-1D	ChemSewer	2,270,000		1.6	Scaled to Z-20
Z-11	ChemSewer	2,500,000		1.8	Scaled to Z-20
Z-19	ChemSewer	2,050,000		1.4	Scaled to Z-20
U-10 pond	Z-1D + Z-11 + Z-19	5,450,000		(3.8)	80% of Z-1D + Z-11 + Z-19
Z-20	ChemSewer	1,106,000		1.3	71 ppmv, k_H = 0.0305 atm-m^3/mol

Table C-3. Carbon Tetrachloride Distribution Among Z Soil Disposal Sites

Crib	Waste Type	Total aq+org kgal	kgal ORG	CCl_4 mT	References
Total				633	
Total vapor stripped				90	Vapor stripping campaign, Z-9, Z-1A, Z-18, Z-12, 1992-2016
Vadose hydrolysis				371	from 1965 to 2016, $T_{½}$ = 40 yrs*

*Jeffers et al., 1996, "Hydrolysis of Carbon Tetrachloride."

The SIMv1 HSW-org organic waste streams contained a large fraction of Pu and Am sent to HSW cribs. While it is certainly true that these organic streams were contaminated with Pu, the amounts likely varied and were not reported separately from HSW-aq. Because both HSW-aq and HSW-org were disposed to the same soil crib sites, Z-1A, Z-9, and Z-18, SIMv2 assumes all Pu/Am residues were in HSW-aq. Any further analysis of vadose zone transport of these COPCs would need to account for organic versus aqueous partitioning.

C2.3 231-Z Metallurgical Lab Waste (LSW)

The 231-Z Building was north of the main Z Plant complex (Figure C-4) and was not a production facility during the period 1967-77 (HNF-EP-0924). Although the 231-Z mission evolved over time, during this period it basically supported metallurgical R&D for the production facilities around the U.S. Department of Energy complex. The SIMv1 assigned this waste as the KOH scrubber for HF offgas, which assumed it was a concentrated HSW stream. However, the volumes reported (139 ML) over 11 years seem more consistent with other LSW streams, which have only a component of KOH scrubber with the balance from other operations. This change reduces potassium from 32,000 mT and fluoride from 7,900 mT to more reasonable values, 860 and 211 mT, respectively, a factor of 37 decrease.

The amount of Pu in this waste stream was substantially less than the typical LSW, though. This is consistent with that facility's research and development function. While crib Z-12 received 37 kg Pu (split between Z-361 settling tank and Z-12 crib), Z-16 and Z-17 reportedly hold only 0.070 kg Pu between them (SGW-35955, *Inventory Estimates for Sludge Currently in Tank 241-Z-361*).

C2.4 Other Contamination

The lower portion of Figure C-5 shows a conceptual model for the large volumes of ChemSewer and Cooling Water that were generated during Z Plant operations. The volumes of these streams were some 41 times the combined volumes of LSW and HSW.

C2.4.1 Z Area Chem Sewer, Cooling Water , Lab Wst

Up until 1980, these liquids were sent to open ditches or trenches Z-1D, Z-11, and Z-19, which retained most solids but lost most soluble species as they flowed into the U-10 pond. After 1980, these liquids were routed instead to closed trench Z-20 adjacent to Z-19 and those liquids percolated to the GW.

According to many flowsheet documents (Upington, 1970; 12820-89-LHR-001) and in SIMv1, no CCl_4 was present in ChemSewer waste. However, one report (Upington, 1970) estimated that as much as 1.1 mT CCl_4 (185 gals or just one failed batch) could have been disposed to Z-11 in 1969. The floor and sink drains associated with ChemSewer were likely contaminated with CCl_4 as a result of process upsets and spills, and it is therefore likely that ChemSewer contained some CCl_4.

An estimate for CCl_4 comes from vapor sampling of Z-20 in 1991 (WHC-SD-EN-AP-046, *200 West Area Carbon Tetrachloride Expedited Response Action Project Plan*) that showed 71 ppmv CCl_4. The 71 ppmv CCl4 for Z-20 along with a Henry's Law constant of 0.0305 atm/m^3/mol for CCl_4 at 25°C suggests that there was 0.36 mg/L CCl_4 in ChemSewer waste, which is 0.16 mT CCl_4 per year for Z-11 instead of the 1.1 mT/yr estimate (Upington 1970). That concentration of CCl_4 in Z-20 forms the basis not only for Z-20 but also provides the CCl_4 amounts routed to Z-1D, Z-11, and Z-19, as shown in Figure C-5 and Table C-3 for each of those cribs. An estimate for the amount of CCl4 routed to U-10 pond results from further assuming that 80% of that total liquid reaches U-10 pond.

C2.4.2 Settling Tank 241-Z-361 Overflow to Z-1%2, Z-3, Z-12

The LSW sent to these three cribs was routed through the Z-361 settling tank that has been extensively assayed. Table C-4 shows that reported inventory along with the totals according to the SIMwaste LSW definition. Note that several species are many times the total amounts present in LSW.

Table C-4. Reported* and Total LSW Inventory for Settling Tank 241-Z-361

Compound	kg by Assay	LSW kg	Percentage
Al	2,540	5,181	49
Ca	5,780	2,644	219
Cr	318	83	383
Cd	67		
Fe	2,060	280	736
Ni	71	22	323
Zn	29		
Mg	705	486	145
Na	1,490	83,669	1.8
K		693,270	
Si	604	301	201
Cl	67	3,898	1.7
F	559	169,000	0.33
NO_3	44	1,254,000	
NO_2	98	4697	
SO_4	158	1872	8.4
PO_4	104	161	65
Hg	5.2	17	31

Table C-4. Reported* and Total LSW Inventory for Settling Tank 241-Z-361

Compound	kg by Assay	LSW kg	Percentage
Pu	32	58	53
Am-241	0.66	1.2	53

*SGW-35955, *Inventory Estimates for Sludge Currently in Tank 241-Z-361*.

Calcium silicate ($CaSiO_3$) is the basic component of concrete, and it is likely that some of the Si and Ca (140% of Si) present in Z-361 is due to concrete erosion. It is also likely that some of these metals are due to corrosion of stainless and other steel results in a proportional amount of Fe, Cr (25% of Fe), and Ni (14 % of Fe); however, because the 241-Z-361 tank assays do show these species, it appears that the LSW flowsheet values might be low for some elements.

C2.4.3 Settling Tank 241-Z-8 Overflow to Crib 216-Z-8

This tank and french drain were only used for a short period of time (HNF-EP-0924). The undissolved PuO_2 in the recuplex feed was filtered with a diatomaceous earth filter aid (silica) and that slurry was sent for disposal to 241-Z-8 settling tank and 216-Z-8 French drain.

C2.4.4 Open Ditches Z-1D, Z-11, and Z-19 to U-10 Pond

Current SIM assumptions simply are that these three trenches only retained 20% of liquids disposed to these trenches and the balance 80% of liquids flowed into U-10 pond. However, the trenches retained 99% of the Pu and only 1% of the Pu inventory flowed to U-10 pond (WHC-EP-0707, *216-U-10 Pond and 216-Z-19 Ditch Characterization Studies*).

These liquids were routed to the closed Z-20 trench beginning in 1980 and no further liquids were disposed to the open trenches. Since Z-20 was a closed trench, no liquids disposed to Z-20 flowed into the U-10 pond and all inventory remains in Z-20 vadose, including Pu and CCl_4.

C2.5 Distribution of Mercury and Inclusion of Magnesium

A transcription error in SIM2005 incorrectly showed very large amounts of mercury in various Z Area waste sites (Hg symbol for mercury is sometimes mistaken for Mg, magnesium). This SIM2005 error showed over 757,000 kg of mercury in various Z Area waste sites, whereas only about 370 kg Hg were disposed to these sites based on historical records including crib assays. As discussed in HNF-31792, this error was due to misreading of $Mg(NO_3)_2$ in the discharge record as $Hg(NO_3)_2$ from a partially obscured copy of a notebook (Mercer, 1985). The correct mercury concentration for HSW is based on the memo by Upington (1970), which provides a chemical composition of HSW discharged to Z-18 crib in Year 1969 based on the plant inventory. It indicates that 60 lbs of mercury was discharged in the 207.4 kgal of HSW. This results in mercury concentration of approximately 29 µg/g assuming a 1.03 g/cm3 density of the waste stream.

Because there are rather large amounts of magnesium sulfate in both HSW and LSW, SIMv2 added magnesium replacing FeCN and now includes the extra sulfate as well. There was no FeCN in any tank liquids since this species was insoluble and so replacing FeCN with Mg does not result in any problems. The Mg noted in Table C-1 and Table C-2 has been added to these Z Area wastes and therefore affects Z Area soil sites.

- 231-Z Metal Lab (Z2)
- 234-5Z (BT1) D-6
- 234-5Z (Z1) D-6
- 234-5Z (Z2) D-6
- RG Process (BT1)
- Recuplex (BT1) aqu
- Recuplex (Z1) aqu
- Recuplex (Z2) aqu

For the LSW, a mercury inventory estimate is based on a soil core from the Z-7 crib that received predominantly LSW throughout its history of operation (Z-7 crib received LSW from RG process as well as lab wastes from 231-Z process). Core C4183 provides the vertical distribution of mercury up to a depth of about 69 m for Z-7 crib. In the vertical profile, the spike in concentration occurs at the depth interval of 5.3 m and 6.1 m and the mercury concentration assay was 5.6 µg/g. Above and below this interval the concentrations are lower and in the range of 0.4 to 1.4 µg/g.

Assuming that the majority of the mercury mass is located within the 1 m thick interval at soil concentration of 5.6 µg/g concentration and considering the areal extent of the Z-7 crib of 138 m^2 (46 m × 1.5 m × 2 trenches) and soil bulk density of 1750 kg/m3, the mass of mercury discharged is calculated to be about 1.3 kg. Based on the mean volume estimate of LSW discharge from SIM (2005) of 73.3 ML, the LSW concentration is estimated to be about 0.018 µg/g considering the mean waste stream density of 1.01 g/cm3. This concentration is consistent with the extensive core assays for the sludge in settling tank Z-361 that calculated mercury inventory with fairly high confidence.

Based on the core sample information, about 6.9 kg of mercury is calculated to be precipitated as sludge in Z-361 settling tank (SGW-35955 [2008]). This amount is estimated to be about 41% of the total mercury mass routed through the tank, based on the discharge volumes and LSW concentration estimated above. SIM calculations did not account for this settling before discharge to Z-1%2, Z-3, and Z-21 cribs and correspondingly does not adjust the discharged mercury inventories. In addition to reports of mercury in cribs, there is one report of mercury in RMC waste stream at 0.3 ppb (D&D-30349), which was routed to Z-20 crib along with relatively uncontaminated cooling water waste stream. It is not clear why the RMC flowsheet appeared to have much lower Hg than was actually measured in the Z-20 crib.

Table C-5 shows a total of 374 kg of discharged mercury and the distribution of mercury among various Z cribs based on the above described methodology. The results are presented without an uncertainty estimate in the inventory and thus should be viewed as mean values.

Table C-5. Distribution of Mercury Among Z Cribs

Crib	Volume of Liquid Discharge (ML)	Volume of HSW or LSW Liquid Discharge (ML)	Mean Mercury (kg)	Basis
Z-1%2 (old Z-1/2)	3.36E+01	3.35E+01 (LSW) 1.70E-01 (HSW)	3.5 [a]	Upington (1970); Recuplex HSW
Z-1A	6.20E+00	4.50E+00 (HSW)	140	Upington (1970); Recuplex HSW
Z-9	4.16E+00	3.61E+00 (HSW)	109 [b]	Upington (1970); Recuplex HSW
Z-18	3.86E+00	3.42E+00 (HSW)	103	Upington (1970); Recuplex HSW
Z-361	4.69E+02		6.9 [a]	Z-361 sludge, Z-7 soil assay (overflow routed to Z-1%2, Z-3, Z-12)
Z-3	1.78E+02	1.78E+02 (LSW)	1.9 [a]	Z-361 sludge, Z-7 soil assay

Table C-5. Distribution of Mercury Among Z Cribs

Crib	Volume of Liquid Discharge (ML)	Volume of HSW or LSW Liquid Discharge (ML)	Mean Mercury (kg)	Basis
Z-12	2.54E+02	2.54E+02 (LSW)	4.5 [a]	Z-361 sludge, Z-7 soil assay
Z-4	1.10E-02	1.10E-02 (LSW)	~0	Z-361 sludge, Z-7 soil assay
Z-5	3.10E+01	3.10E+01 (LSW)	0.56	Z-361 sludge, Z-7 soil assay
Z-6	9.83E-03	9.83E-03 (LSW)	~0	Z-361 sludge, Z-7 soil assay
Z-7	7.98E+01	7.33E+01 (LSW)	1.3	Estimate from Z-7 soil core assay (C4183)
Z-10	9.83E-01	9.83E-01 (LSW)	~0	Z-361 sludge, Z-7 soil assay
Z-16	1.02E+02	1.02E+02 (LSW)	2.3	Z-361 sludge, Z-7 soil assay
Z-17	3.70E+01	3.70E+01 (LSW)	0.84	Z-361 sludge, Z-7 soil assay
Total mass			374	

a. Settling tank Z-361 sludge retained about 41% of mercury routed through it. Cribs show just remnant mercury after accounting for 41% settling in Z-361. Note that mercury concentration of LSW streams (especially for Z-12) varied.

b. The upper 12 in. of Z-9 soil was mined in 1976, but the Hg in SIMv2 includes all Hg sent to Z-9.

C3 Changes for SIMv2 from SIMv1

The following sections document various change types that occurred between the SIMv1 and SIMv2.

C3.1 Routing Changes

- Reroute 216-Z-8 to 241-Z-8 tank only; partition liquid to 216-Z-8 crib
- The SIMv2 shows the actual flow of waste went to tank 241-Z-8 and then overflowed into the 216-Z-8 crib. The SIMv1 did not show this.
- Reroute LSW sludge to Z-361; partition liquid to Z-1%2 (Z-1/2), Z-3, Z-12 cribs
- The SIMv2 shows the actual flow of waste went to tank 241-Z-361 and then overflowed into the various cribs. The SIMv1 did not show this activity.
- Reroute CoolingWater /ChemSewer/Lab to Z-1D, Z-11, Z-19 instead of U-10;
- The SIMv2 shows waste flowing into the Z-1D, Z-11, and Z-19 trenches first instead of flowing directly into U-10 pond, as SIMv1 did.
- Partition 80% liquid inventory, 1% of Pu to U-10 pond from Z-1D, Z-11, Z-19.
- A previous report (WHC-EP-0707) describes this partition.

C3.2 SIMsite Changes

- Add tank 241-Z-8 as settling tank for 216-Z-8 and HSW with filter aid. This tank was not included in SIMv1.
- Remove HSW-org adds from Z-1%2 (was Z-1/2, which got dropped due to Excel error with slashes in names). The SIMv1 incorrectly routed organic waste.
- Remove HSW-org adds from 216-Z-8. The SIMv1 incorrectly routed organic waste.
- Remove HSW-org adds from Z-20. The SIMv1 incorrectly routed organic waste.
- Add Z-9 mine site for Z-9 mined soil and Pu. The SIMv1 did not show the mining of Pu from Z-9.
- Subtract CCl_4 90 mT (0.14 ML) inventory from Z-9, Z-1A, Z-18, Z-12 due to vapor stripping. The SIMv1 did not show the vapor stripping.
- Show 450 mT of Z-12 vitrified in 1987. The SIMv1 did not show the vitrification.
- Change Z-1/2 to Z-1%2 to avoid Excel selection problems for text with slashes.
- Add tank 241-Z-361 for settling sludge from Z-1%2, Z-3, and Z-12 adds. The SIMv1 did not show the tank.

C3.3 SIMwaste Changes

There are many assignments of HSW to LSW cribs and it is very unlikely that LSW cribs received much HSW. Processes tended to be hard plumbed into a given crib or crib set and there was not much ability to reroute waste streams. Therefore, the large amounts of HSW routed to LSW cribs has been changed to LSW SIMwastes instead.

The most telling example is the settling tank Z-361, ostensibly an LSW settling tank, and its three cribs: Z-1%2, Z-7, and Z-12, which SIMv1 routed 34 kgal of HSW as recuplex waste. However, the Hg and Na assays of tank 241-Z-361 are inconsistent with HSW and agree with LSW. The SIMsite Z-12 was designated an LSW crib, yet SIMv1 routed 3,700 kgal of HSW to Z-12, which also included 135 mT CCl_4.

C4 Pu Inventories for SIMv2

Table C-6 and Figure C-6 show the SIMv2 Pu distribution among Z Area SIMsites as well as ML volume released and kg CCl_4. Also included in the table are parenthetical total Pu routed through both settling tank prior to crib and crib residuals. As Figure C-3 shows, the connections and routings were quite involved and so differ from the results of SIMv1 for each SIMsite, but the total Pu inventory barely changes.

Table C-1. Target SIMsite Inventories for Z Area

Index	SIMsite	Type	ML	Pu kg	CCl_4 kg
1	216-Z-1%2 (old Z-1/2)	LSW crib	34	7.5 (15 [a])	31
2	216-Z-1A	HSW crib	6.2	56	271,652
3	216-Z-3	LSW crib	178	5.6 (11 [a])	65

Table C-1. Target SIMsite Inventories for Z Area

Index	SIMsite	Type	ML	Pu kg	CCl_4 kg
4	216-Z-4	LSW crib	0.011	0.011	
5	216-Z-5	LSW crib	31	0.5	10
6	216-Z-6	LSW crib	0.098	0.024	
7	216-Z-7	LSW crib	80	7.9	24
8	216-Z-8	HSW french drain	0.067 [b]	1.7 [b]	
9	216-Z-9	HSW crib	4.1	90.2	184,567
	216-Z-9	Mined in 1976		-58	
10	216-Z-10	LSW crib	1.0	0.24	0.3
11	216-Z-11	Open trench to U-10	9,459	3.0	1,754
12	216-Z-12	LSW/HSW crib	257	19 [d] (37 [a])	60[†]
	216-Z-12	450 mT soil vitrified ’87			
13	216-Z-13	French drain	50		
14	216-Z-14	French drain	52		
15	216-Z-15	French drain	48		
16	216-Z-16	LSW crib	102	0.07	
17	216-Z-17	LSW crib	37		
18	216-Z-18	HSW crib	3.9	32	169,957
19	216-Z-19	Open trench to U-10	7,740	2.5	1,435
20	216-Z-20	Closed trench	4,190	2.3	1,314
21	216-Z-21	Seepage basin	1,570		
22	216-Z1D	Open trench to U-10	8,600	2.8	1,595
		Totals	**32,433**	**199**	**632,466**
		Vapor stripping			–77,000 [d]
			~same as before	was 175 kg	was 912,000 kg
23	216-U-10	Open pond fed by Z-1D, Z-11, Z-19	25,799 [c]	8.3 [c]	3,804 [c]
24	241-Z-361	LSW settling tank for Z-1%2, Z-3, Z-12	469 [a]	32 a	
25	241-Z-8	HSW settling tank	0.067 [b]	1.7 [b]	

a. Total volume routed through Z-361 settling tank, but only 48% of Pu kg is amount now in tank sludge.
b. Actual amounts are split between 241-Z-8 settling tank and 216-Z-8 french drain.
c. Actual amounts in U-10 pond are a fraction of listed sums of Z-1D, Z-11, Z-19.
d. Not yet implemented in SIMv2 as noted in text.

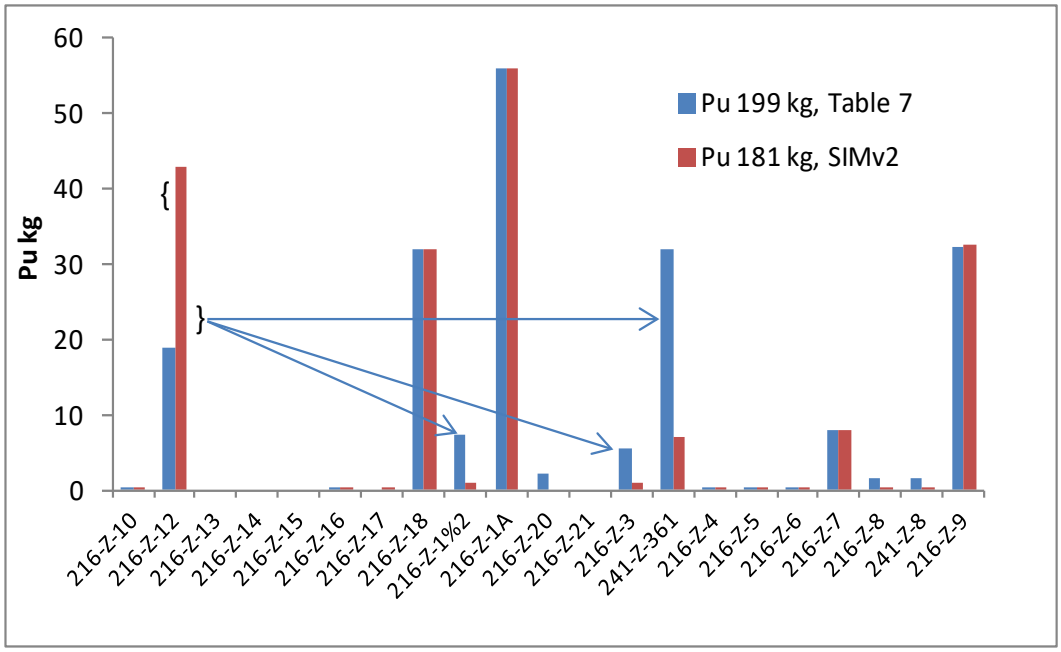

Figure C-1. Plot Comparing Pu Distribution Among Z Cribs in SIMv2

As noted previously, the SIMv1 inventory for Z-12 had 136,000 kg of CCl_4, but there are no records of organic routed to this crib, and there is no indication of large amounts of CCl_4 from crib vapor samples. However, SIMv2 has not yet adjusted the Z-12 CCl_4 inventory as shown in Table C-6 because it was important to first validate that SIMv2 reproduced the SMv1 inventory. Also, it would be necessary to explicitly include waste transfers from one SIMsite to another downstream SIMsite. Likewise, the Pu redistribution shown in Figure C-6 is also not been implemented in SIMv2 for a similar reason. As noted above, SIM-v2 would need to implement explicit flows from one SIMsite to another, which is very different from the SIMwaste to SIMsite of SIM-v1.

C5 Open Issues

Propagating waste liquids and solids correctly among settling tanks, cribs, open trenches, and finally to U-10 Pond is needed for correctly partitioning the inventory. This should ideally be done with a more sophisticated modeling tool considering process dynamics and rerouting of wastes between sites. The SIMv2 model includes only simple assumptions based on the available soil assays and SIMv2 retains 20% of liquids and 99% of Pu in the open trenches and sends 80% of liquids and 1% of Pu to U-10 pond.

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Appendix D

Radionuclide Regrowth and Decay

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Table

Table D-1. Half-Life Constants and Assumptions Applied in the Regrowth Calculations D-3

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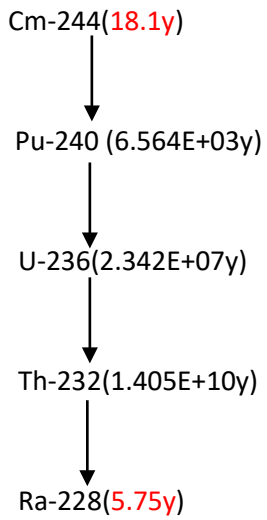
D1 Radionuclide Regrowth and Decay

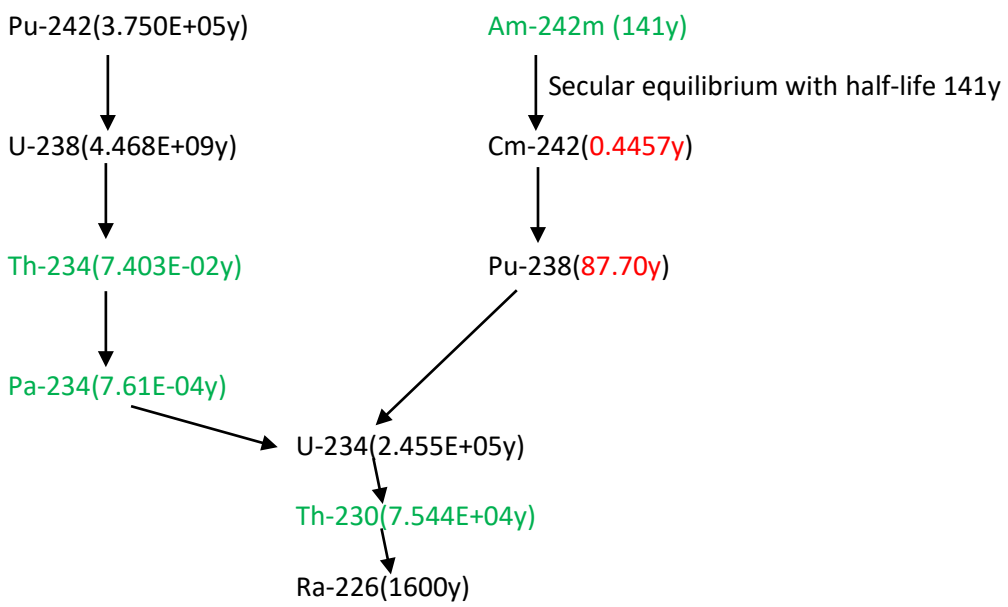
The SIM-v2 received pre-decayed radionuclide inventory/concentrations from ORIGEN2 and DKPRO to decay date January 1, 2001, even though SIM release events occurred at various dates. However, contaminant transport calculations need radionuclide inventories at the time of the release events; therefore, SIM-v2 now includes a module to regrow the radionuclide activity from the decay date to the year of release for each SIMsite from 1944-2000. The maximum time to regrow the inventory is 55 years, which is comparably shorter than most of the reported radionuclides' half-lives. Therefore, was possible to approximate the following decay chains and apply 1st and 2nd order decay equations in Chapter 3.

D2 Decay Chains

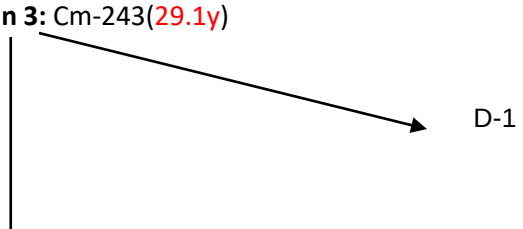
Decay chain 1: Green colored nuclides are not present in SIM list

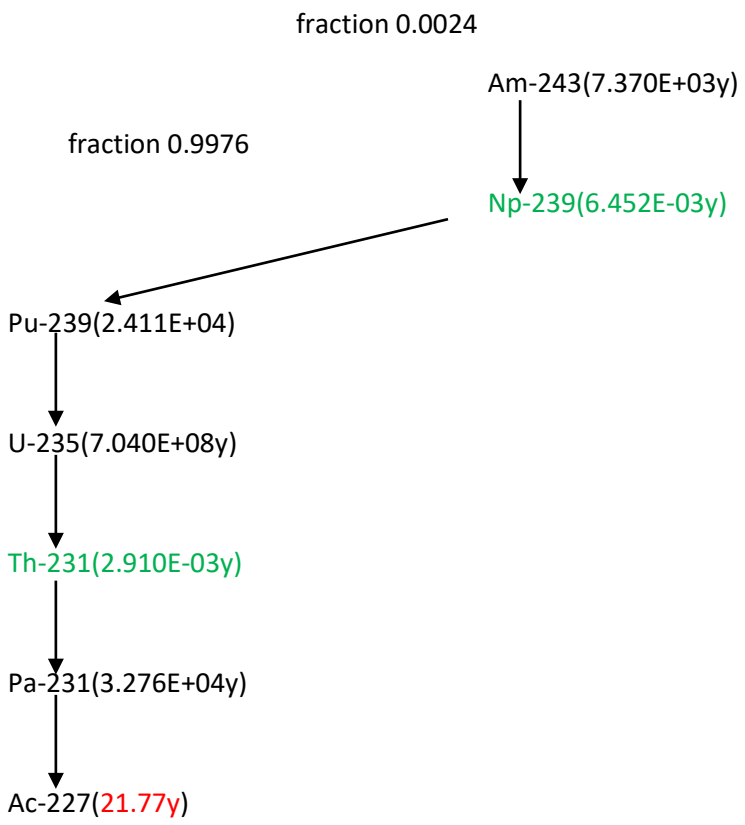


Decay chain 2:

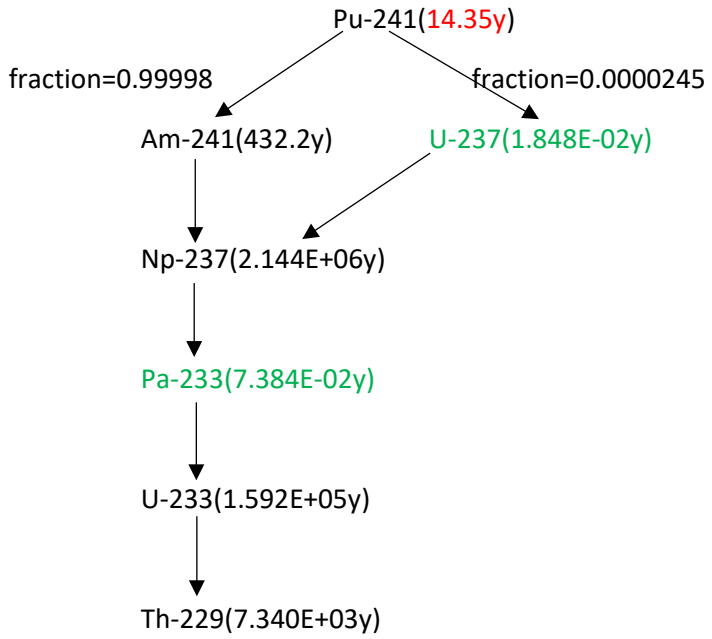


Decay chain 3: Cm-243(29.1y)





Decay chain 4:



D3 Half-Life Constants

The radionuclide half-lives in Table D-1 are from the ICRP database and publication number 107 (ICRP, *Nuclear Decay Data for Dosimetric Calculations*). The ICRP half-lives provide a much more defensible basis for SIM-v2 compared with SIM-v1 (EMDT-DE-0006, *Half-Lives for Typical Hanford Site Radioactive Contaminants*).

Table D-1. Half-Life Constants and Assumptions Applied in the Regrowth Calculations

SIM-v2 (2017) index	Analyte	ICRP Publication 107			Regrowth Assumptions
		Half-Life	Units	Half-life (yr)	
30	H-3	12.32	y	1.232E+01	1st order decay
31	C-14	5700	y	5.700E+03	1st order decay
32	Ni-59	1.01E+05	y	1.010E+05	1st order decay
33	Ni-63	100.1	y	1.001E+02	1st order decay
34	Co-60	5.2713	y	5.271E+00	1st order decay
35	Se-79	2.95E+05	y	2.950E+05	1st order decay
36	Sr-90	28.79	y	2.879E+01	1st order decay
37	Y-90	64.10	h	7.312E-03	Y-90 in secular equilibrium with Sr-90 parent
38	Zr-93	1.53E+06	y	1.530E+06	1st order decay
39	Nb-93m	16.13	y	16.1	Generation term from parent (Zr-93) to daughter (Nb-93m)
40	Tc-99	2.111E+05	y	2.111E+05	1st order decay
41	Ru-106	373.59	d	1.023E+00	1st order decay
42	Cd-113m	1.41E+01	y	1.410E+01	1st order decay
43	Sb-125	2.7586	y	2.759E+00	1st order decay
44	Sn-126	2.30E+05	y	2.300E+05	1st order decay
45	I-129	1.57E+07	y	1.570E+07	1st order decay
46	Cs-134	2.0648	y	2.065E+00	1st order decay
47	Cs-137	30.167	y	3.017E+01	1st order decay
48	Ba-137m	2.552	min	4.852E-06	Ba-137m in secular equilibrium with Cs-137 parent at 0.944 branching yield factor
49	Sm-151	90	y	9.000E+01	1st order decay
50	Eu-152	13.537	y	1.354E+01	1st order decay
51	Eu-154	8.593	y	8.593E+00	1st order decay
52	Eu-155	4.7611	y	4.761E+00	1st order decay

Table D-1. Half-Life Constants and Assumptions Applied in the Regrowth Calculations

SIM-v2 (2017) index	Analyte	ICRP Publication 107			Regrowth Assumptions
		Half-Life	Units	Half-life (yr)	
53	Ra-226	1600	y	1600	Generation term from parent (Th-230) to daughter (Ra-226)
54	Ra-228	5.75	y	5.750	Generation term from parent (Th-232) to daughter (Ra-228)
55	Ac-227	21.772	y	21.77	Generation term from parent (Pa-231) to daughter (Ac-227)
56	Pa-231	3.276E+04	y	3.276E+04	Generation term from parent (U-235) to daughter (Pa-231)
57	Th-229	7340	y	7.340E+03	Generation term from parent (U-233) to daughter (Th-229)
58	Th-232	1.41E+10	y	1.405E+10	Generation term from parent (U-236) to daughter (Th-232)
59	U-232	68.9	y	6.890E+01	1st order
60	U-233	1.592E+05	y	1.592E+05	Generation term from parent (Np-237) to daughter (U-233)
61	U-234	2.455E+05	y	2.455E+05	Generation term from parents (U-238 and Pu-238) to daughter (U-234)
62	U-235	7.04E+08	y	7.040E+08	Generation term from parent (Pu-239) to daughter (U-235)
63	U-236	2.342E+07	y	2.342E+07	Generation term from parent (Pu-240) to daughter (U-236)
64	U-238	4.468E+09	y	4.468E+09	Generation term from parent (Pu-242) to daughter (U-238)
	U-Total			--	
66	Np-237	2.144E+06	y	2.144E+06	Generation term from parents (Pu-241*0.00002245 and Am-241) to daughter (Np-237)
67	Pu-238	87.7	y	87.7	Generation term from parent (Cm-242) to daughter (Pu-238)
68	Pu-239	24110	y	2.411E+04	Generation term from parents (Am-243 and Cm-243) to daughter (Pu-239)
69	Pu-240	6564	y	6.564E+03	Generation term from parent (Cm-244) to daughter (Pu-240)
70	Pu-241	14.350	y	1.435E+01	1st order decay
71	Pu-242	3.75E+05	y	3.750E+05	1st order decay

Table D-1. Half-Life Constants and Assumptions Applied in the Regrowth Calculations

SIM-v2 (2017) index	Analyte	ICRP Publication 107			Regrowth Assumptions
		Half-Life	Units	Half-life (yr)	
72	Am-241	432.2	y	432.2	Generation term from parent (Pu-241) to daughter (Am-241)
73	Am-243	7370	y	7.370E+03	Generation term from parent (Cm-244) *0.0024 to daughter (Am-243)
74	Cm-242	162.8	d	4.457E-01	(a) Cm-242 assumed to be in secular equilibrium with Am-242m parent. Lambda calculated using 141 yr half-life of Am-242m.
75	Cm-243	29.1	y	29.1	1st order decay
76	Cm-244	18.1	y	1.810E+01	1st order decay
77	Th-230	75380	Y		Generation term from parent U-234 to daughter (Th-230)

D4 Matlab Code for Inventory Postprocessing

The following chapter describes class definitions, inventory functions, and other codes. The algorithm script is implemented in Matlab to build SIM-v2 inventory as a data structure so that it can be decay corrected calling the decay procedure and output can be organized to the desired screened inventory.

D1.1 Inventory Class Definition

```
classdef inventory
        properties
           SiteName='';
           SiteType;
           ActiveYears;
           VolumeMean;
           VolumeStd;
           ChemicalsMassMean=Chemicals.all;
           ChemicalsMassStd=Chemicals.all;
           RadionuclidesActivityMean=Radionuclides.all;
           RadionuclidesActivityStd=Radionuclides.all;
           RadionuclidesDecayToYear;
           WasteForms ={'Liquid'};
           Sources= {'SIM'};
           OPU='';
           Location;
        end
       methods
            function obj = inventory(varargin)
                switch nargin
                    case 14
                        obj.SiteName=varargin{1};
                        obj.SiteType=varargin{2};
                        obj.ActiveYears=varargin{3};
                        obj.VolumeMean=varargin{4};
```

```
        obj.VolumeStd=varargin{5};
        obj.ChemicalsMassMean=varargin{6};
        obj.ChemicalsMassStd=varargin{7};
        obj.RadionuclidesActivityMean=varargin{8};
        obj.RadionuclidesActivityStd=varargin{9};
        obj.RadionuclidesDecayToYear=varargin{10};
        obj.WasteForms =varargin{11};
        obj.Sources=varargin{12};
        obj.OPU=varargin{13};
        obj.Location=varargin{14};

    case 13
        obj.SiteName=varargin{1};
        obj.SiteType=varargin{2};
        obj.ActiveYears=varargin{3};
        obj.VolumeMean=varargin{4};
        obj.VolumeStd=varargin{5};
        obj.ChemicalsMassMean=varargin{6};
        obj.ChemicalsMassStd=varargin{7};
        obj.RadionuclidesActivityMean=varargin{8};
        obj.RadionuclidesActivityStd=varargin{9};
        obj.RadionuclidesDecayToYear=varargin{10};
        obj.WasteForms =varargin{11};
        obj.Sources=varargin{12};
        obj.OPU=varargin{13};

    case 12 % general site not associated with operable units
        obj.SiteName=varargin{1};
        obj.SiteType=varargin{2};
        obj.ActiveYears=varargin{3};
        obj.VolumeMean=varargin{4};
        obj.VolumeStd=varargin{5};
        obj.ChemicalsMassMean=varargin{6};
        obj.ChemicalsMassStd=varargin{7};
        obj.RadionuclidesActivityMean=varargin{8};
        obj.RadionuclidesActivityStd=varargin{9};
        obj.RadionuclidesDecayToYear=varargin{10};
        obj.WasteForms =varargin{11};
        obj.Sources=varargin{12};

    case 11  % SIM site with radionuclide inventory
        obj.SiteName=varargin{1};
        obj.SiteType=varargin{2};
        obj.ActiveYears=varargin{3};
        obj.VolumeMean=varargin{4};
        obj.VolumeStd=varargin{5};
        obj.ChemicalsMassMean=varargin{6};
        obj.ChemicalsMassStd=varargin{7};
        obj.RadionuclidesActivityMean=varargin{8};
        obj.RadionuclidesActivityStd=varargin{9};
        obj.RadionuclidesDecayToYear=varargin{10};
        obj.WasteForms =varargin{11};

    case 8 % SIM site with only chemical inventory
        obj.SiteName=varargin{1};
        obj.SiteType=varargin{2};
        obj.ActiveYears=varargin{3};
```

```
                        obj.VolumeMean=varargin{4};
                        obj.VolumeStd=varargin{5};
                        obj.ChemicalsMassMean=varargin{6};
                        obj.ChemicalsMassStd=varargin{7};
                        obj.WasteForms =varargin{8};

                    case 5 % water-only site (in addition to SIM sites)
                        obj.SiteName=varargin{1};
                        obj.SiteType=varargin{2};
                        obj.ActiveYears=varargin{3};
                        obj.VolumeMean=varargin{4};
                        obj.VolumeStd=varargin{5};

                     otherwise
                        disp('other value')
                end
            end
        end
end
```

D1.2 Chemicals Class Definition

```
classdef Chemicals < Simulink.IntEnumType
  enumeration
    Na(1)
    Al(2)
    Fe(3)
    Cr(4)
    bi(5)
    La(6)
    Hg(7)
    Zr(8)
    Pb(9)
    Ni(10)
    Ag(11)
    Mn(12)
    Mg(13)
    Ca(14)
    K(15)
    OH(16)
    NO3(17)
    NO2(18)
    CO3(19)
    PO4(20)
    SO4(21)
    Si(22)
    F(23)
    Cl(24)
    CCl4(25)
    Butanol(26)
    TBP(27)
    NPH(28)
    NH3(29)
  end

  methods (Static = true)
```

```
      function retVal = getDescription()
      % GETDESCRIPTION Specifies a string to describe this enumerated type.
      retVal = 'This defines an enumerated type for Chemicals';
    end
      function retVal = all()
      % ALL returns enumerations of chemicals.
      retVal = enumeration('Chemicals')';
    end

    function retVal = getDefaultValue()
      % GETDEFAULTVALUE Specifies the default enumeration member.
      % Return a valid member of this enumeration class to specify the
default.
      % If you do not define this method, Simulink uses the first member.
      retVal = Chemicals.OH;
    end

    function retVal = getDataScope()
      % GETDATASCOPE Specifies whether generated code imports or exports this
type.
      % Return one of these strings:
      % 'Auto':     define type in model_types.h, or import if header file
specified
      % 'Exported': define type in a generated header file
      % 'Imported': import type definition from specified header file
      % If you do not define this method, DataScope is 'Auto' by default.
      retVal = 'Imported';
    end

     function retVal = getHeaderFile()
      % GETHEADERFILE Specifies the file that defines this type in generated
code.
      % The method getDataScope determines the significance of the specified
file.
      retVal = 'imported_enum_type.h';
    end

    function retVal = addClassNameToEnumNames()
      % ADDCLASSNAMETOENUMNAMES Specifies whether to add the class name
      % as a prefix to enumeration member names in generated code.
      % Return true or false.
      % If you do not define this method, no prefix is added.
      retVal = false;
    end % function
  end % methods
end % classdef
```

D1.3 Radionuclides Class Definition

```
classdef Radionuclides < Simulink.IntEnumType
  enumeration
    H3(1)
    C14(2)
    Ni59(3)
    Ni63(4)
    Co60(5)
    Se79(6)
```

```
    Sr90(7)
    Y90(8)
    Zr93(9)
    Nb93m(10)
    Tc99(11)
    Ru106(12)
    Cd113m(13)
    Sb125(14)
    Sn126(15)
    I129(16)
    Cs134(17)
    Cs137(18)
    Ba137m(19)
    Sm151(20)
    Eu152(21)
    Eu154(22)
    Eu155(23)
    Ra226(24)
    Ra228(25)
    Ac227(26)
    Pa231(27)
    Th229(28)
    Th232(29)
    U232(30)
    U233(31)
    U234(32)
    U235(33)
    U236(34)
    U238(35)
    U_Total(36)
    Np237(37)
    Pu238(38)
    Pu239(39)
    Pu240(40)
    Pu241(41)
    Pu242(42)
    Am241(43)
    Am243(44)
    Cm242(45)
    Cm243(46)
    Cm244(47)
  end

  methods (Static = true)
      function retVal = getDescription()
      % GETDESCRIPTION Specifies a string to describe this enumerated type.
      retVal = 'This defines an enumerated type for radionuclides ';
    end
      function retVal = all()
      % ALL returns enumerations of radionuclides.
      retVal = enumeration('Radionuclides')';
    end
    function retVal = getDefaultValue()
      % GETDEFAULTVALUE Specifies the default enumeration member.
      % Return a valid member of this enumeration class to specify the
default.
      % If you do not define this method, Simulink uses the first member.
```

```
      retVal = radionuclides.U_Total;
    end

    function retVal = getDataScope()
      % GETDATASCOPE Specifies whether generated code imports or exports this
type.
      % Return one of these strings:
      % 'Auto':     define type in model_types.h, or import if header file
specified
      % 'Exported': define type in a generated header file
      % 'Imported': import type definition from specified header file
      % If you do not define this method, DataScope is 'Auto' by default.
      retVal = 'Imported';
    end

     function retVal = getHeaderFile()
      % GETHEADERFILE Specifies the file that defines this type in generated
code.
      % The method getDataScope determines the significance of the specified
file.
      retVal = 'imported_enum_type.h';
    end

    function retVal = addClassNameToEnumNames()
      % ADDCLASSNAMETOENUMNAMES Specifies whether to add the class name
      % as a prefix to enumeration member names in generated code.
      % Return true or false.Radionuclides
      % If you do not define this method, no prefix is added.
      retVal = false;
    end % function
  end % methods
end % classdef
```

D1.4 Reading SIM Output into Matlab Workspace

```
function OPU_SitesData =ReadSimOPU(OPU_Name)

InventoryFile=char(OPU_Name+string('.xlsx'));
VolumeFile=char(OPU_Name+string('_Volume.xlsx'));


[status, SiteNames]=xlsfinfo(VolumeFile);
[m,n]=size(SiteNames);

    for I = 1:n
           [a,SiteName,b]=xlsread(VolumeFile, char(SiteNames(I)),'A2');
           NumberAT=xlsread(VolumeFile, char(SiteNames(I)),'A4');
           ActiveYears=xlsread(VolumeFile,
char(SiteNames(I)),char(string('B4:B')+(3+NumberAT)));
                for j = 1:NumberAT
                offset(j)=ActiveYears(j)-1944;
                VolumeMean(j,1)=xlsread(VolumeFile,
char(SiteNames(I)),char(string('D')+(4+offset(j))));
                VolumeStd(j,1)=xlsread(VolumeFile,
char(SiteNames(I)),char(string('E')+(4+offset(j))));
```

```
                ChemicalsMassMean(j,:)=xlsread(InventoryFile,
char(SiteNames(I)),char(string('g')+(4+offset(j)*80)+string(':g')+(28+4+offse
t(j)*80)))';
                ChemicalsMassStd(j,:)=xlsread(InventoryFile,
char(SiteNames(I)),char(string('H')+(4+offset(j)*80)+string(':H')+(28+4+offse
t(j)*80)))';
                RadionuclidesActivityMean(j,:)=xlsread(InventoryFile,
char(SiteNames(I)),char(string('g')+(33+offset(j)*80)+string(':g')+(83+offset
(j)*80)))';
                RadionuclidesActivityStd(j,:)=xlsread(InventoryFile,
char(SiteNames(I)),char(string('H')+(33+offset(j)*80)+string(':H')+(83+offset
(j)*80)))';
                RadionuclidesDecayToYear=2000;
                WasteForms ={'Liquid'};
                Sources= {'SIM'};
                end

    OPU_SitesData.(char(string('Site_')+SiteNames(I))) =inventory(
SiteName,...

ActiveYears,...

VolumeMean,...

VolumeStd,...

ChemicalsMassMean,...

ChemicalsMassStd,...

RadionuclidesActivityMean,...

RadionuclidesActivityStd,...

RadionuclidesDecayToYear,...

WasteForms,...

Sources,...

                offset=[];
                VolumeMean=[];
                VolumeStd=[];
                ChemicalsMassMean=[];
                ChemicalsMassStd=[];
                RadionuclidesActivityMean=[];
                RadionuclidesActivityStd=[];
                RadionuclidesDecayToYear=[];
                                                        OPU_Name);
end

end
```

D1.5 Decay/Regrow

```
function [ RadOut ] = DecayRegrow( DelT, RadIn  )
```

```
%Regrow radionuclides

%%
%The immediate purpose of the updated tool is to back-decay (Regrow) waste
%streams/inventories for Composite Analysis (CA) using the reported Soil
%Inventory Model (SIM) compositions that were decayed to January1st 2001
%while the simulation will start from 1944.
%Implementation was upgraded from the TWINS Radionuclide Decay Calculator
%(TRDC) with more generalization of the 2nd order decay to include
%generation terms allowing accurate regrow and decay. Decay chains in
%"Species" were for the inventoried SIM as modeled in GoldSim® to check
%the decay calculation. Regrowing decayed inventory happens if Delt is -ve.
%Both "Decay" and "Regrow" were tested to produce the initial inventory of
%each other with zero absolute errors. The decay calculations were also
%checked by comparisons with GoldSim simulation results that
%will be reported separately.
%Revised 5/18/17
%Implemented by: Usama Zaher, Ph.D., P.E.
%INTERA inc.
%uzaher@intera.com %%

%HalfLives in years
HalfLives(1)=1.23200E+01;      %H-3
HalfLives(2)=5.70000E+03;      %C-14
HalfLives(3)=1.01000E+05;      %Ni-59
HalfLives(4)=1.00100E+02;      %Ni-63
HalfLives(5)=5.27130E+00;      %Co-60
HalfLives(6)=2.95000E+05;      %Se-79
HalfLives(7)=2.87900E+01;      %Sr-90
HalfLives(8)=7.31234E-03;      %Y-90
HalfLives(9)=1.53000E+06;      %Zr-93
HalfLives(10)=1.61300E+01;     %Nb-93m (parent Zr-93)
HalfLives(11)=2.11100E+05;     %Tc-99
HalfLives(12)=1.02283E+00;     %Ru-106
HalfLives(13)=1.41000E+01;     %Cd-113m
HalfLives(14)=2.75860E+00;     %Sb-125
HalfLives(15)=2.30000E+05;     %Sn-126
HalfLives(16)=1.57000E+07;     %I-129
HalfLives(17)=2.06480E+00;     %Cs-134
HalfLives(18)=3.01671E+01;     %Cs-137
HalfLives(19)=4.85208E-06;     %Ba-137m
HalfLives(20)=9.00000E+01;     %Sm-151
HalfLives(21)=1.35370E+01;     %Eu-152
HalfLives(22)=8.59300E+00;     %Eu-154
HalfLives(23)=4.76110E+00;     %Eu-155
HalfLives(24)=1.60000E+03;     %Ra-226
HalfLives(25)=5.75000E+00;     %Ra-228 (parent Th-232)
HalfLives(26)=2.17720E+01;     %Ac-227 (parent Pa-231)
HalfLives(27)=3.27600E+04;     %Pa-231
HalfLives(28)=7.34000E+03;     %Th-229
HalfLives(29)=1.40500E+10;     %Th-232
HalfLives(30)=6.89000E+01;     %U-232
HalfLives(31)=1.59200E+05;     %U-233
HalfLives(32)=2.45500E+05;     %U-234
HalfLives(33)=7.04000E+08;     %U-235
HalfLives(34)=2.34200E+07;     %U-236
HalfLives(35)=4.46800E+09;     %U-238
```

```
HalfLives(36)=4.46800E+09;     % total U is number 36 calculated as function
of other U isotopes
HalfLives(37)=2.14400E+06;     %Np-237
HalfLives(38)=8.77000E+01;     %Pu-238
HalfLives(39)=2.41100E+04;     %Pu-239
HalfLives(40)=6.56400E+03;     %Pu-240
HalfLives(41)=1.43500E+01;     %Pu-241
HalfLives(42)=3.75000E+05;     %Pu-242
HalfLives(43)=4.32200E+02;     %Am-241 (parent Pu-241)  241 Am
HalfLives(44)=7.37000E+03;     %Am-243
HalfLives(45)=1.41000E+02;     %Am242m/Cm-242   Note (g)Cm-242 assumed to be
in secular equilibrium with 141 yr Am-242m parent (despite not part of the
equilibrium. )
HalfLives(46)=2.91000E+01;     %Cm-243
HalfLives(47)=1.81000E+01;     %Cm-244
HalfLives(48)=7.53800E+04;     %Th-230

Lambda = log(2)./(HalfLives.*365.25); % decay rate (day^-1)
DecayFactor = exp(-Lambda .* DelT);
DecayFactor(8)=DecayFactor(7);       %Note(a)   Y-90 in secular equilibrium
with Sr-90 parent.

%Calculating Regrown inventory
    %1st order regrowth of decayed parents
RadOut=zeros(1,47);
RadOut(1:7)= RadIn(1:7).*DecayFactor(1:7);
RadOut(9)= RadIn(9)*DecayFactor(9);
RadOut(11:18)= RadIn(11:18).*DecayFactor(11:18);
RadOut(20:23)= RadIn(20:23).*DecayFactor(20:23);
RadOut(30)= RadIn(30)*DecayFactor(30);
RadOut(41)= RadIn(41)*DecayFactor(41);
RadOut(42)= RadIn(42)*DecayFactor(42);
RadOut(45)= RadIn(45)*DecayFactor(45);
RadOut(46)= RadIn(46)*DecayFactor(46);
RadOut(47)= RadIn(47)*DecayFactor(47);

    % 2nd order approximated regrowth of daughters by: deduction terms of
generation from parents and adding reversed decay
RadOut(8)= RadIn(8)*DecayFactor(8)+RadIn(7)*Lambda(8)/(Lambda(8)-
Lambda(7))*(DecayFactor(7)-DecayFactor(8)); %Y-90 in secular equilibrium with
Sr-90 parent.
RadOut(10)= RadIn(10)*DecayFactor(10)+RadIn(9)*Lambda(10)/(Lambda(10)-
Lambda(9))*(DecayFactor(9)-DecayFactor(10))*0.975; % Generation term from
parent (Zr-93) to daughter (Nb-93m).
RadOut(19)= RadOut(18)*0.944; %Note (c) Ba-137m in secular equilibrium with
and calculated directly from Cs-137 parent at 0.944 branching yield factor.
Direct calculation from Cs-137 is to match GoldSim results

RadOut(24)= RadIn(24)*DecayFactor(24)+RadIn(48)*Lambda(24)/(Lambda(24)-
Lambda(48))*(DecayFactor(48)-DecayFactor(24));%Generation term from parent
(Th-230) to daughter (Ra-226).
RadOut(35)= RadIn(35)*DecayFactor(35)+RadIn(42)*Lambda(35)/(Lambda(35)-
Lambda(42))*(DecayFactor(42)-DecayFactor(35));%Generation term from parent
(Pu-242) to daughter (U-238).
RadOut(38)= RadIn(38)*DecayFactor(38)+RadIn(45)*Lambda(38)/(Lambda(38)-
Lambda(45))*(DecayFactor(45)-DecayFactor(38));%Generation term from parent
(Cm-242) to daughter (Pu-238).
```

```
RadOut(32)= RadIn(32)*DecayFactor(32)+RadIn(35)*Lambda(32)/(Lambda(32)-
Lambda(35))*(DecayFactor(35)-
DecayFactor(32))+RadIn(38)*Lambda(32)/(Lambda(32)-
Lambda(38))*(DecayFactor(38)-DecayFactor(32));%Generation term from parents
(U-238 and Pu-238) to daughter (U-234).
RadOut(40)=RadIn(40)*DecayFactor(40)+RadIn(47)*Lambda(40)/(Lambda(40)-
Lambda(47))*(DecayFactor(47)-DecayFactor(40));%Generation term from parent
(Cm-244) to daughter (Pu-240).
RadOut(34)= RadIn(34)*DecayFactor(34)+RadIn(40)*Lambda(34)/(Lambda(34)-
Lambda(40))*(DecayFactor(40)-DecayFactor(34));%Generation term from parent
(Pu-240) to daughter (U-236).
RadOut(29)= RadIn(29)*DecayFactor(29)+RadIn(34)*Lambda(29)/(Lambda(29)-
Lambda(34))*(DecayFactor(34)-DecayFactor(29));%Generation term from parent
(U-236) to daughter (Th-232).
RadOut(25)= RadIn(25)*DecayFactor(25)+RadIn(29)*Lambda(25)/(Lambda(25)-
Lambda(29))*(DecayFactor(29)-DecayFactor(25));%Generation term from parent
(Th-232) to daughter (Ra-228).
RadOut(43)= RadIn(43)*DecayFactor(43)+RadIn(41)*Lambda(43)/(Lambda(43)-
Lambda(41))*(DecayFactor(41)-DecayFactor(43))*0.99998; %Generation term from
parent (Pu-241) to daughter (Am-241).
RadOut(37)= RadIn(37)*DecayFactor(37)+RadIn(41)*Lambda(37)/(Lambda(37)-
Lambda(41))*(DecayFactor(41)-
DecayFactor(37))*0.0000245+RadIn(42)*Lambda(37)/(Lambda(37)-
Lambda(42))*(DecayFactor(42)-DecayFactor(37));%Generation term from parents
(Pu-241*0.00002245 and Am-241) to daughter (Np-237).
RadOut(31)= RadIn(31)*DecayFactor(31)+RadIn(37)*Lambda(31)/(Lambda(31)-
Lambda(37))*(DecayFactor(37)-DecayFactor(31));%Generation term from parent
(Np-237) to daughter (U-233).
RadOut(28)= RadIn(28)*DecayFactor(28)+RadIn(31)*Lambda(28)/(Lambda(28)-
Lambda(31))*(DecayFactor(31)-DecayFactor(28));%Generation term from parent
(U-233) to daughter (Th-229).
RadOut(44)= RadIn(44)*DecayFactor(44)+RadIn(46)*Lambda(44)/(Lambda(44)-
Lambda(46))*(DecayFactor(46)-DecayFactor(44))*0.0024; %Generation term from
parent (Cm-244) *0.0024 to daughter (Am-243).
RadOut(39)= RadIn(39)*DecayFactor(39)+RadIn(44)*Lambda(39)/(Lambda(39)-
Lambda(44))*(DecayFactor(44)-
DecayFactor(39))+RadIn(46)*Lambda(39)/(Lambda(39)-
Lambda(46))*(DecayFactor(46)-DecayFactor(39))*0.9976; %Generation term from
parents (Am-243 and Cm-243) to daughter (Pu-239).
RadOut(33)= RadIn(33)*DecayFactor(33)+RadIn(39)*Lambda(33)/(Lambda(33)-
Lambda(39))*(DecayFactor(39)-DecayFactor(33));%Generation term from parent
(Pu-239) to daughter (U-235).
RadOut(27)= RadIn(27)*DecayFactor(27)+RadIn(33)*Lambda(27)/(Lambda(27)-
Lambda(33))*(DecayFactor(33)-DecayFactor(27));%Generation term from parent
(U-235) to daughter (Pa-231).
RadOut(26)= RadIn(26)*DecayFactor(26)+RadIn(27)*Lambda(26)/(Lambda(26)-
Lambda(27))*(DecayFactor(27)-DecayFactor(26));%Generation term from
parent(Pa-231) to daughter (Ac-227).
RadOut(48)= RadIn(48)*DecayFactor(48)+RadIn(32)*Lambda(48)/(Lambda(48)-
Lambda(32))*(DecayFactor(32)-DecayFactor(48));% Generation term from parent
U-234 to daughter (Th-230); Th-230 Was added to the SIM array to get Ra-226
right
    for I=1:48
        if RadOut(I) < 0
            RadOut(I)=0;
        end
    end
```

```
end
```

D1.6 Write CA Inventory Function

```
function CAOPU = WriteCASimOPU(OPU_Struct, OPU_Name)
OutFile=char(OPU_Name+string('_Inventory.xlsx'));
Sheet1=char(OPU_Name+string('_M'));
Sheet2=char(OPU_Name+string('_Std'));
Title1={'WIDS_Name','WasteForm','year','VolumeMean','Hydrogen 3 [Ci]','Carbon
14  [Ci]','Cobalt 60  [Ci]','Selenium 79  [Ci]','Strontium 90
[Ci]','Zirconium 93  [Ci]','Niobium 93m  [Ci]','Technetium 99  [Ci]','Tin 126
[Ci]','Iodine 129  [Ci]','Caesium 137  [Ci]','Europium 152  [Ci]','Europium
154  [Ci]','Europium 155  [Ci]','Protactinium 231  [Ci]','Thorium 232
[Ci]','Uranium 232  [Ci]','Uranium 233  [Ci]','Uranium 234  [Ci]','Uranium
235  [Ci]','Uranium 236  [Ci]','Uranium 238  [Ci]','Neptunium 237
[Ci]','Plutonium 238  [Ci]','Plutonium 239  [Ci]','Plutonium 240
[Ci]','Plutonium 241  [Ci]','Plutonium 242  [Ci]','Americium 241
[Ci]','Americium 243  [Ci]','Chlorine-36  [Ci]','Polonium-209
[Ci]','Potassium-40  [Ci]','Rhenium-187  [Ci]'};
Title2={'WIDS_Name','WasteForm','year','VolumeStd','Hydrogen 3 [Ci]','Carbon
14  [Ci]','Cobalt 60  [Ci]','Selenium 79  [Ci]','Strontium 90
[Ci]','Zirconium 93  [Ci]','Niobium 93m  [Ci]','Technetium 99  [Ci]','Tin 126
[Ci]','Iodine 129  [Ci]','Caesium 137  [Ci]','Europium 152  [Ci]','Europium
154  [Ci]','Europium 155  [Ci]','Protactinium 231  [Ci]','Thorium 232
[Ci]','Uranium 232  [Ci]','Uranium 233  [Ci]','Uranium 234  [Ci]','Uranium
235  [Ci]','Uranium 236  [Ci]','Uranium 238  [Ci]','Neptunium 237
[Ci]','Plutonium 238  [Ci]','Plutonium 239  [Ci]','Plutonium 240
[Ci]','Plutonium 241  [Ci]','Plutonium 242  [Ci]','Americium 241
[Ci]','Americium 243  [Ci]','Chlorine-36  [Ci]','Polonium-209
[Ci]','Potassium-40  [Ci]','Rhenium-187  [Ci]'};
xlswrite(OutFile,Title1,Sheet1,'A1');
xlswrite(OutFile,Title2,Sheet2,'A1');
OPU_Sites = fields(OPU_Struct);
N_Sites = size(OPU_Sites);
WriPos=1;
    for i=1 : N_Sites(1)
    SiteName=OPU_Struct.(char(OPU_Sites(i))).SiteName;
    ActiveYears=OPU_Struct.(char(OPU_Sites(i))).ActiveYears;
    N_ActiveYears= size(ActiveYears);
    DecayYear=OPU_Struct.(char(OPU_Sites(i))).RadionuclidesDecayToYear;
    WasteForm=OPU_Struct.(char(OPU_Sites(i))).WasteForms;

        for j=1 : N_ActiveYears
            WriPos=WriPos+1;
            xlrange=char( string('A') + WriPos)
            VolumeM=OPU_Struct.(char(OPU_Sites(i))).VolumeMean(j);
            VolumeStd=OPU_Struct.(char(OPU_Sites(i))).VolumeStd(j);
            RadsM=DecayRegrow((ActiveYears(j)-
DecayYear)*365.25,OPU_Struct.(char(OPU_Sites(i))).RadionuclidesActivityMean(j
,:));
            RadsStd=DecayRegrow((ActiveYears(j)-
DecayYear)*365.25,OPU_Struct.(char(OPU_Sites(i))).RadionuclidesActivityStd(j,
:));
            CA_Out_M={char(SiteName), char(WasteForm), ActiveYears(j),
VolumeM, RadsM(1), RadsM(2), RadsM(5),   RadsM(6),   RadsM(7),   RadsM(9),
```

```
RadsM(10), RadsM(11), RadsM(15), RadsM(16), RadsM(18), RadsM(21), RadsM(22),
RadsM(23), RadsM(27), RadsM(29), RadsM(30), RadsM(31), RadsM(32), RadsM(33),
RadsM(34), RadsM(35), RadsM(37),  RadsM(38),  RadsM(39),  RadsM(40),
RadsM(41),  RadsM(42),  RadsM(43),  RadsM(44),0,0,0,0};
            CA_Out_Std={char(SiteName), char(WasteForm), ActiveYears(j),
VolumeStd, RadsStd(1), RadsStd(2), RadsStd(5), RadsStd(6), RadsStd(7),
RadsStd(9), RadsStd(10), RadsStd(11), RadsStd(15), RadsStd(16), RadsStd(18),
RadsStd(21), RadsStd(22), RadsStd(23), RadsStd(27), RadsStd(29), RadsStd(30),
RadsStd(31), RadsStd(32), RadsStd(33), RadsStd(34), RadsStd(35), RadsStd(37),
RadsStd(38),    RadsStd(39),    RadsStd(40),    RadsStd(41),    RadsStd(42),
RadsStd(43),    RadsStd(44),0,0,0,0};
            xlswrite(OutFile,CA_Out_M,Sheet1,xlrange);
            xlswrite(OutFile,CA_Out_Std,Sheet2,xlrange);
        end

    end
end
```

D1.7 ReadRegrow and Write CA Inventory

```
1
OPU_200_BC_1=ReadSimOPU('OPU_200_BC_1')
WriteCASimOPU(OPU_200_BC_1, 'OPU_200_BC_1')
2
OPU_200_CB_1=ReadSimOPU('OPU_200_CB_1')
WriteCASimOPU(OPU_200_CB_1, 'OPU_200_CB_1')
3
OPU_200_CP_1=ReadSimOPU('OPU_200_CP_1')
WriteCASimOPU(OPU_200_CP_1, 'OPU_200_CP_1')
4
OPU_200_CR_1=ReadSimOPU('OPU_200_CR_1')
WriteCASimOPU(OPU_200_CR_1, 'OPU_200_CR_1')
5
OPU_200_CW_1=ReadSimOPU('OPU_200_CW_1')
WriteCASimOPU(OPU_200_CW_1, 'OPU_200_CW_1')
6
OPU_200_CW_3=ReadSimOPU('OPU_200_CW_3')
WriteCASimOPU(OPU_200_CW_3, 'OPU_200_CW_3')
7
OPU_200_CW_5=ReadSimOPU('OPU_200_CW_5')
WriteCASimOPU(OPU_200_CW_5, 'OPU_200_CW_5')
8
OPU_200_DV_1=ReadSimOPU('OPU_200_DV_1')
WriteCASimOPU(OPU_200_DV_1, 'OPU_200_DV_1')
9
OPU_200_EA_1=ReadSimOPU('OPU_200_EA_1')
WriteCASimOPU(OPU_200_EA_1, 'OPU_200_EA_1')
10
OPU_200_IS_1=ReadSimOPU('OPU_200_IS_1')
WriteCASimOPU(OPU_200_IS_1, 'OPU_200_IS_1')
11
OPU_200_OA_1=ReadSimOPU('OPU_200_OA_1')
WriteCASimOPU(OPU_200_OA_1, 'OPU_200_OA_1')
12
OPU_200_PW_1=ReadSimOPU('OPU_200_PW_1')
WriteCASimOPU(OPU_200_PW_1, 'OPU_200_PW_1')
13
```

```
OPU_200_PW_3=ReadSimOPU('OPU_200_PW_3')
WriteCASimOPU(OPU_200_PW_3, 'OPU_200_PW_3')
14
OPU_200_PW_6=ReadSimOPU('OPU_200_PW_6')
WriteCASimOPU(OPU_200_PW_6, 'OPU_200_PW_6')
15
OPU_200_SW_2=ReadSimOPU('OPU_200_SW_2')
WriteCASimOPU(OPU_200_SW_2, 'OPU_200_SW_2')
16
OPU_200_WA_1=ReadSimOPU('OPU_200_WA_1')
WriteCASimOPU(OPU_200_WA_1, 'OPU_200_WA_1')
17
OPU_300_FF_1=ReadSimOPU('OPU_300_FF_1')
WriteCASimOPU(OPU_300_FF_1, 'OPU_300_FF_1')
18
OPU_300_FF_2=ReadSimOPU('OPU_300_FF_2')
WriteCASimOPU(OPU_300_FF_2, 'OPU_300_FF_2')
19
OPU_Not_accepted=ReadSimOPU('OPU_Not_accepted')
WriteCASimOPU(OPU_Not_accepted, 'OPU_Not_accepted')
20
OPU_Proposed_not_accepted=ReadSimOPU('OPU_Proposed_not_accepted')
WriteCASimOPU(OPU_Proposed_not_accepted, 'OPU_Proposed_not_accepted')
21
OPU_Rejected=ReadSimOPU('OPU_Rejected')
WriteCASimOPU(OPU_Rejected, 'OPU_Rejected')
22
OPU_WMA_A_AX=ReadSimOPU('OPU_WMA A_AX')
WriteCASimOPU(OPU_WMA_A_AX, 'OPU_WMA_A_AX')
23
OPU_WMA_B_BX_BY=ReadSimOPU('OPU_WMA B_BX_BY')
WriteCASimOPU(OPU_WMA_B_BX_BY, 'OPU_WMA_B_BX_BY')
24
OPU_WMA_C=ReadSimOPU('OPU_WMA C')
WriteCASimOPU(OPU_WMA_C, 'OPU_WMA_C')
25
OPU_WMA_S_SX=ReadSimOPU('OPU_WMA S_SX')
WriteCASimOPU(OPU_WMA_S_SX, 'OPU_WMA_S_SX')
26
OPU_WMA_T=ReadSimOPU('OPU_WMA T')
WriteCASimOPU(OPU_WMA_T, 'OPU_WMA_T')
27
OPU_WMA_TX_TY=ReadSimOPU('OPU_WMA TX_TY')
WriteCASimOPU(OPU_WMA_TX_TY, 'OPU_WMA_TX_TY')
28
OPU_WMA_U=ReadSimOPU('OPU_WMA U')
WriteCASimOPU(OPU_WMA_U, 'OPU_WMA_U')
```

D5 References

EMDT-DE-0006, 2017, *Half-Lives for Typical Hanford Site Radioactive Contaminants*, Rev. 1, Environmental Modeling Data Transmittal, CH2M HILL Plateau Remediation Company, Richland, Washington.

ICRP Publication 107, 2008, *Nuclear Decay Data for Dosimetric Calculations*, International Commission on Radiological Protection, New York, New York. Available at: http://www.icrp.org/publication.asp?id=ICRP%20Publication%20107.

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Appendix E

Independent Check Tools of SIM-v2 Input Updates and Results

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E1 Introduction

This appendix provides definitions of the Excel spreadsheet tools that were used for verifying SIM-v2 calculations of input volume, checking estimated inventory, and providing examples of the ion balance of imported HDW OH^- estimates. Input sheets of concentrations input were added to workbook SIMrev2 so that it was used as a check tool of the estimated inventory. The definitions of used worksheets are explained in Chapter E.2. Chapter E.3 lists the sheet definitions of another workbook "SMMbyQtrs.xlsx" presenting the quarterly run results of HDW, which were used to estimate tank composition at time of tank leaks so that SIM-v2 use the composition to estimate the leak inventory matching the reported leak volumes and Cs-137 estimates. Chapter E.3 lists two examples of the ion balance applied in HDW to estimate OH^- levels in waste streams.

E2 Excel Workbook for SIM-v2 Independent Check

SIMrev2 is a workbook for total site inventories used to check and develop SIM-v2 input. The SIM-V1 used a set of four workbooks as input and then output results to a large set of other workbooks for each disposal zone with only a summary of information provided for all SIMsites.

The SIMrev2 workbook incorporates all the SIM-V1 input into worksheets within a single workbook. The SIMrev2 calculates means and RSDs summing the inventory overall years and provides that information in just one single worksheet, SIMsiteMeans.

The SIMsiteMeans and SIMsiteRSDs worksheets in the SIMrev2 workbook calculate SIMsite inventories given SIMbyYear event volumes and SIMwasteMeans compositions from RPP-26744 Rev. 0 (SIM-V1) with SIMrev2 updates.

The SIMsiteMeans worksheet restructures the previous SIM-V1 worksheets:

SiteInput
AnalyteInput
DensityInput

Note that the SIM-v1 workbook detailed all the volume, concentration, and density inputs but only summarizes resultant inventory for waste disposal zones and not for each site. The details of each SIMsite appear in a set of spreadsheets named for each of the disposal zones in the accompanying folder.

To facilitate comparison with SIM-v1, SIMrev2 incorporated all the SIM-v1 means and RSDs for all SIMsites into two SIMrev2 worksheets. The following are the SIMrev2 worksheets:

E2.1.1 SIMsiteMeans

This calculates SIMsite means from sumproduct of SIMwasteMeans and SIMbyYear volumes (Figure E-1). The notable addition of WTR to the SIMbyYear worksheet shows up here as both added WTR (positive ML) and evaporated WTR (negative ML).

E2.1.2 SIMsiteRSDs

This propagates rsd's from sumproduct of SIMwasteRSD and SIMbyYear volumes and has the same logical structure as SIMsiteMeans shown in Figure E-1.

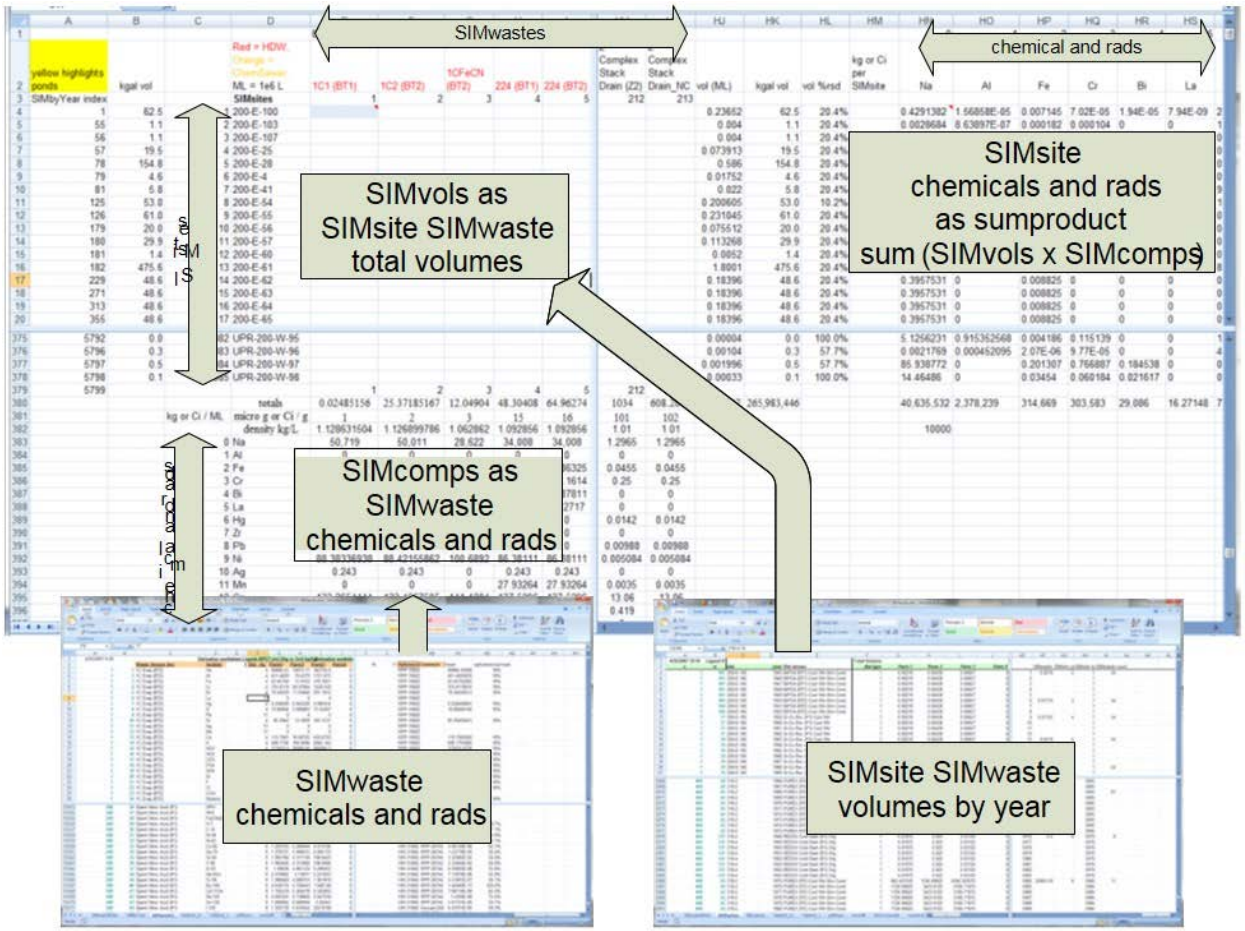

Figure E-1. SIMsiteMeans Worksheet

E2.1.3 SIMbyYear

This is the year-event list of SIM transaction volume PDFs sorted first by SIMsite and second by year. The new SIMsite WTR represents the ML of WTR either positive for dilution or negative for evaporation. It includes pivot table indices for summing volume means

Note that SIMwaste event-year RSDs do not propagate independently, so their uncertainties do not cancel out. Likewise, HDW volumeRSDs in leak events do not propagate individually.

SIMwasteMeans

This worksheet pulls a matrix of SIMwastes versus chemicals and rads from the waste species listing in SIMwastes similar to the SIM-V1 worksheet, while SIMwasteMeans is new to SIMrev2.

SIMwasteRSDs

This worksheet pulls a matrix of SIMwaste RSDs versus analytes from the listing in SIMwastes. This worksheet is new to SIMrev2.

SIMwastes

A list of 75 species PDFs for 196 SIMwastes much as it appeared in SIM-V1 as input to OCB. This is the source of both SIMwasteMeans and SIMwasteRSDs.

SIMyearsFactor

To compare SIM-v1 estimates that have multiple errors in uncertainties, this worksheet provide a year averaging factor. This factor allows SIMrev2 to compare with SIM-v1 and therefore validates SIMrev2 input from SIM-v1 by introducing the same error into the SIMrev2 RSDs.

AnalVsMC

Facilitates scatterplots for comparisons between analytical error calculation of SIMrev2 with the Monte Carlo error propagation by OCB in SIM-V1.

SIM-V1means

The SIMsite means reported from SIM-V1 by the OCB.

SIM-V1stdDev

The SIMsite RSDs reported from SIM-V1 by the OCB.

newSimSort

This worksheet sorts SIMwaste names by origin, and SIMsiteMeans uses the worksheet to order SIMwastes.

The SIMsiteRSDs worksheet also propagates an RSDas the square root of the sum of mass weighted variances.

Normally called site 216-Z-1/2, site 216-Z-1%2 crib had been mistakenly dropped by SIM-V1 from the SIMsiteMeans due to the "/" in its name.

E3 HDW Quarterly Run

The SIM-V1 workbooks provided detailed information about each disposal zone, but the tank leak vectors all derived from the supernatant mixing model (SMM) workbook, which was not included in SIM-v1. The SIM-rev2 workbook integrates all of the SMM tank leak vectors into the SIMbyYear worksheet, but changes in leak dates need the SMMbyQtrsSIM workbook.

The SMMbyQtrsSIM represents the last run of HDWrev4 with Wstrs_350a and shows the SMM and TLM vectors for each Hanford tank per quarter from 1944 through 1998. The HDWrev5 worksheet provides chemicals and radionuclides for each SMM and TLM from which tank inventories derive.

The SMMbyQtrsSIM workbook supports the SIMrev2 by accounting for waste mixing, concentration, and dilution by incorporating +/-WTR to account for dilution/concentration of waste liquids. The SIM-v1 did not account for concentration or dilution of tank wastes affecting inventory estimates of unplanned releases and tank leak estimates in SIM-v1.

The time of the leak can also affect the tank composition as Figure E-2 shows for tank C-105 with projected sampling points and estimated leak events. Different proposed leak events differ by more than an order of magnitude for C-105. The shown dynamic Cs-137 is estimated by the run of HDW-rev4 for each year quarter (EMDT-IN-0025-r0). The years where leak likely occurred were indicated by the unexplained changes of the tank level measurements as part of the HDW input Wstrs_350a.

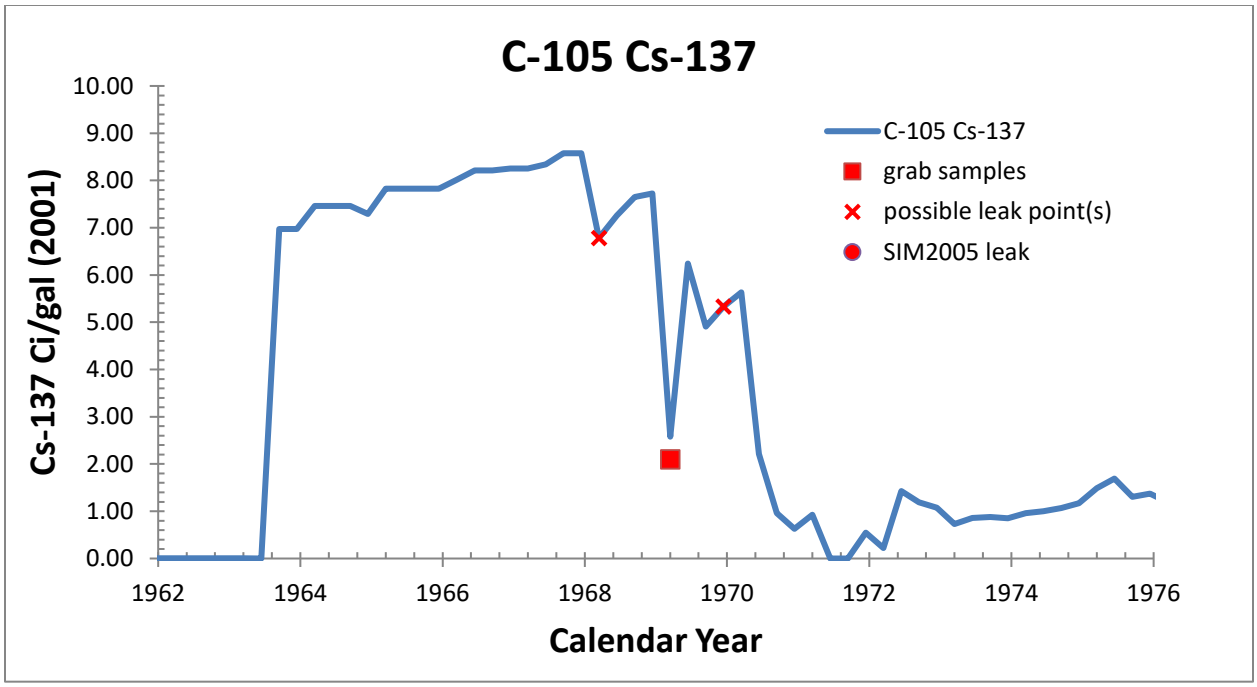

Figure E-1. Cs-137 Concentration Over Operation Years

E3.1.1 ReadMe

This file contains a short description of all the worksheets.

E3.1.2 selectTank

The user selects a tank from pulldown menu in G1, and this worksheet links that tank's inventory from each quarter-year worksheet.

E3.1.3 selectQTR

The user selects a quarter-year from a pulldown menu in D19 and populates this worksheet with that quarter-year worksheet for the entire tank farm.

E3.1.4 SIMleakSMMvectors

This worksheet contains all the leak vectors that have derived from the tank leaks that are part of SIMrev2.

E3.1.5 HDWconc

This file contains HDW Rev. 5 inventories.

E3.1.6 InventoryAtDate

This is an inventory input to EndPointTool at some date in the past.

E3.1.7 1944.2004 through 1998.2004

These worksheets provide a tank by tank inventories at the end of each calendar quarter from 1944 through 1998.

E4 Hydroxide from Ion Balance

Hydroxide, OH^-, was not explicitly included in SIM-V1 but OH^- was implicit in the ion balance for each HDW. Therefore SIM-v2 simply calculates that hydroxide as an ion balance in ppm OH^- and therefore H^+ is equivalent to 1.7e-7/ppm OH^- and so all SIMwastes now have a pH expressed as ppm OH^-.

Hydroxide calculation is

OH^-(ppm) = 17*(sum(ionPPM * ionCharge / ionMW)

unless it is OH^-(ppm) < 0, which means that the stream is acid and so

OH^-(ppm) = -1.7e-7 / (1.00794*sum(ionPPM * ionCharge / ionMW)

since
OH^-(ppm) = 1.7e-7 / H^+(ppm)

and

H^+(ppm) = 1.00794*(sum(ionPPM * ionCharge / ionMW).

Table E-1 shows two examples of the OH- ion balance calculation for R1(R1) and 242-Z Am Rec (Z2). While R1(R1) is a typical caustic tank waste stream, 242-Z Am Rec(Z2) is an acid waste stream that was disposed directly to the soil column.

Table E-1. Calculation to Demonstrate How SIM-v2 Implements OH^- from Charge Balance for a Caustic and Acidic Waste

Species	R1(R1) ppm	mol/L	242-Z Am Rec (Z2) ppm	mols/L	Charge/m.w.	Charge	m.w.
density kg/L	1.26		1.18				
Na	101347	5.57	585	3.00E-02	0.04350	1	22.99
Al	18099	0.85	16017	0.700	-0.03706	-1	26.98
Fe	83	0.0019	47	1.00E-03	0.05372	3	55.847
Cr	2277	0.0554	88	2.00E-03	0.05769	3	52
Bi					0.01436	3	208.98
La					0.02160	3	138.91
Hg	0.26	1.62E-06	30	1.77E-04	0.00997	2	200.59
Zr					0.04385	4	91.22
Pb			88	5.00E-04	0.00965	2	207.19
Ni	85	1.82E-03	39	7.90E-04	0.03407	2	58.71
Ag	0.04	5.21E-07			0.01141	1	87.62

Table E-1. Calculation to Demonstrate How SIM-v2 Implements OH^- from Charge Balance for a Caustic and Acidic Waste

Species	R1(R1) ppm	mol/L	242-Z Am Rec (Z2) ppm	mols/L	Charge/m.w.	Charge	m.w.
Mn	24	5.55E-04	47	1.00E-03	0.03640	2	54.94
Mg					0.04990	2	40.08
Ca	119	3.84E-03	34	1.02E-03	0.05115	2	39.1
K	827	0.0455	33	1.70E-03	0.04350	1	22.99
OH	23830	1.77	6.86E-11	4.76e-15 (0.476 as H+)		-1	17
NO_3	110393	2.25	114999.6	2.19	-0.01613	-1	62
NO_2	27974	0.77	780	2.00E-02	-0.02174	-1	46
CO_3	178	3.75E-03			-0.03333	-2	60.01
PO_4			16	2.00E-04	-0.03159	-3	94.97
SO_4	1464	1.93E-02	163	2.00E-03	-0.02082	-2	96.06
Si	234	1.05E-02			-0.07121	-2	28.0855
F			805	5.00E-02	-0.05263	-1	19
Cl	2680	9.56E-02	297	9.87E-03	-0.02821	-1	35.453

The chemistry of Al makes OH^- tricky since while Al^{3+} is the Al cation in acid, aluminate, $Al(OH)_4^-$, is the anion that carries Al in all caustic wastes. The OH- calculation uses the pK of water, but Al can also buffer the liquid at the aluminate pK in principle. This possibility is ignored and any negative OH^- are simply set to 1.7e-3 ppm OH^-, which is neutral pH = 7 (1e-7 * 17g/mol / 1000 g/L * 1e6).

There are several Z-Area SIMwastes that SIM-v1 set to acid in the range 6-8 M H^+, which seems unlikely. Based on the Z-Area wastes that SIM-v2 documents, the nitrates of these SIMwastes have been arbitrarily reduced to an acid of 1-2 M H^+, which is more consistent with other Z-waste soil disposals. Acid wastes were often directly disposed to the soil column in Z Area to maintain Pu solubility, but it seems unlikely that acids as high as 6-8 M H^+ would have been direct disposed to the cribs.

Appendix F

Description of SIM-v1 Estimate

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Description of SIM-v1 Estimate

This appendix provides the basis currently applied to estimate I-129 discharges to SIMsites based on field and groundwater data. I-129 is one of the fission products from U-235 fueled nuclear reactors over the history of plutonium production at the Hanford Site. The U-235 fission yield of I-129 as a primary fission product, the amount of I-129 produced at Hanford is fairly certain, 49.4 Ci. However, the distribution of that I-129 among tank wastes, releases to the soil column, past atmospheric releases, and other residue compartments is highly uncertain. Until more information is available to perform a site-wide balance of I-129 among these compartments, SIM-v2 currently applies the estimate of SIM-v1 release to the soil sites, matching the estimated groundwater plume according to the annexed note in this appendix.

Brett Simpson

From: Kincaid, Charles T [charley.kincaid@pnl.gov]
Sent: Monday, February 16, 2004 2:21 PM
To: rcorbin@tri-inc.com; bsimpson@tri-inc.com
Cc: Bergeron, Marcel P; Thorne, Paul D; Dresel, P Evan; Bryce, Robert W; Kincaid, Charles T; Nichols, William E; Eslinger, Paul W; Freshley, Mark D
Subject: Request for a Hanford SIM Run - Iodine-129
Attachments: Iodine-129 Retardation Factor_ 2004-02-16.doc

Rob and Brett:

My review of Iodine-129 field data and apparent field scale retardation is complete. I request that you produce a SIM run that places a total of 3.1 curies of iodine-129 (mean value) in the REDOX and PUREX process condensate cribs during their operation.

At REDOX, over its run between 1952 and 1967, place a total of 0.44 Ci of iodine-129 in the series of process condensate cribs receiving waste from the REDOX process. I believe there were four such cribs used over the period; 216-S-1&2, 216-S-7, 216-S-9, and 216-S-23.

At PUREX, over its run between 1956 and 1972, place a total of 2.42 Ci of iodine-129 in the series of process condensate cribs receiving waste from the PUREX process. The cribs were the 216-A-5 and 216-A-10 cribs.

At PUREX, over its run between 1983 and 1988, place a total of 0.22 Ci of iodine-129 in the 216-A-10 and 216-A-45 cribs.

Attached is a copy of my writeup of the brief review conducted.

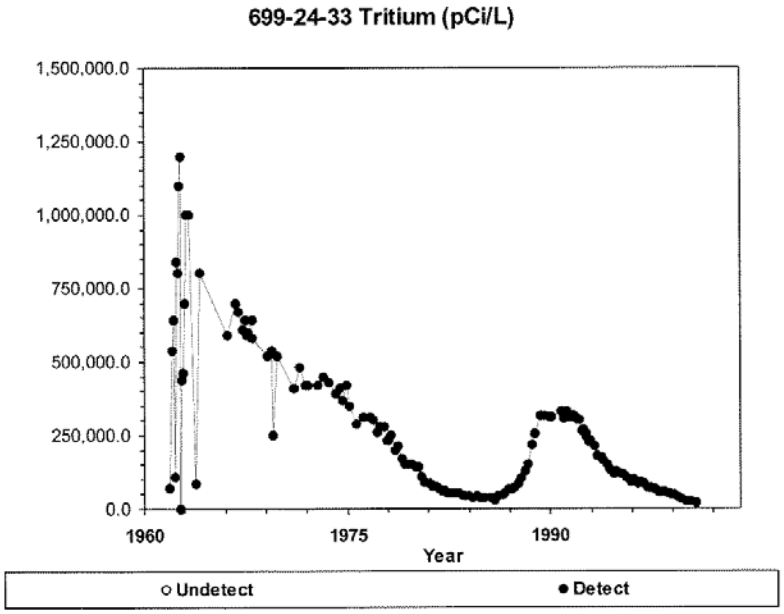
Please let me know in the next day or so when I can expect the SIM run submitted for inclusion in the current Composite Analysis. (I hope that your estimate is no longer than your earlier estimate of 5 working days - sooner if possible.)

<<Iodine-129 Retardation Factor_ 2004-02-16.doc>>
Best Regards, Charley

Date	16 February 2004
To	MP Bergeron, PD Thorne, PE Dresel
From	C T Kincaid
Subject	Field Data Support for an Estimate of Iodine-129 Retardation Factor and Distribution Coefficient

Tritium Arrival at Well 699-24-33

There is evidence of the travel time of tritium releases from PUREX to a well in the vicinity of the central landfill. The data were collected from the early 1960s until present. However, the best evidence of a pulse arrival is associated with the second campaign of PUREX. The pulse from the second campaign at PUREX (1983-1988) appears to begin arriving 1986-1987 and peaks by 1989-1990. These tritium data are from a groundwater monitoring well (#699-24-33) that lies on the edge of the tritium plume.



Uranium Processing

Uranium processing occurred at Hanford from 1944 until 1988. The table below shows year, fuel (short tons), process, and facility. The REDOX plant processed 21,459 short tons between 1952 and 1967. The PUREX plant processed 74,282 short tons between 1956 and 1972. The PUREX plant processed an additional 4302 short tons between 1983 and 1988. Total PUREX processing was 78,584 short tons.

Table of Uranium Processing at Hanford from 1944 until 1988 (after Agnew 1997)

Start Year	End Year	Fuel (short tons)	Process	Fuel (short tons)	Facility
1944	1949	3676	MW1, 1C1, 2C1		B and T Plants
1950	1956	4904	MW2, 1C2, 2C2	8580	B and T Plants
1952	1958	11,905	R1, CWR1		REDOX
1959	1967	9554	R2, CWR2	21,459	REDOX
1956	1962	30,236	P1		PUREX
1963	1967	27,016	P2		PUREX
1968	1972	16,449	P2'		PUREX
1966	1966	191	TH1		PUREX
1970	1970	390	TH2	74,282	PUREX
1983	1988	4302	P3, PL2, CWZr2	4302	PUREX

Agnew et al. (1997)

Study of uranium processing data presented in Watrous and Wooten (1997) for all of Hanford operations, and estimating the uranium processing that occurred in PUREX yields a temporal center-of-mass for the processing. During the first PUREX campaign from 1956 until 1972, the temporal center of mass occurred in early 1963. During the second PUREX campaign from 1983 until 1988, the temporal center of mass occurred in early to mid 1985. The uranium processing data in Watrous and Wooten are shown in the following table of annual uranium processing data for Hanford, and the estimated annual uranium processing data for REDOX and PUREX.

Table of Annual Uranium Processing at Hanford from 1944 until 1988, and the estimated Annual Uranium Processing at REDOX and PUREX (after Watrous and Wooten 1997)

Metric Tons of Uranium Processed at Hanford from 1944 until 1988				
Year	Derived Annual Processing (MTU)	Estimated REDOX and PUREX Production (MTU)	Estimated * PUREX Production Only (MTU)	Subtotals & Temporal Center of Mass
1944	3.27			
1945	560.73			
1946	776			
1947	580			
1948	720			
1949	670			
1950	810			
1951	970			
1952	1120	**		

1953	1520	**		
1954	2370	**		
1955	3300	**		
1956	4500	4500	3330	
1957	5600	5600	4144	
1958	6000	6000	4440	
1959	5500	5500	4070	
1960	6300	6300	4662	
1961	6600	6600	4884	
1962	6400	6400	4736	
1963	6102	6102	4515	
1964	6801	6801	5033	
1965	6809	6809	5038	
1966	5220	5220	3862	
1967	4422	4422	3272	
1968	3827	3827	3827	Subtotal
1969	2840	2840	2840	63904
1970	1090	1090	1090	Temporal CoM
1971	3220	3220	3220	(Center of Mass)
1972	940	940	940	~1963.0
No processing completed in PUREX between 1972 and 1982				
1983	90	90	90	
1984	1090	1090	1090	
1985	1150	1150	1150	Subtotal
1986	850	850	850	99460
1987	130	130	130	Temporal CoM
1988	580	580	580	~1985.4

* It is assumed the PUREX ran 74% of the joint REDOX/PUREX processing between 1956 and 1967, thereafter, only PUREX ran.
** REDOX process began in 1952, but only REDOX and PUREX were processing beginning in 1956 and we're most interested in estimating the PUREX production.

Review of the Iodine-129 Field Data

Data published in the iodine-129 report (Intercontractor Working Group 1987) were grouped by decade (1960s, 1970s, and 1980s) and plotted to determine the movement of iodine-129 from the vicinity of PUREX to the southeast.

Of 26 data points from the 1960s, one is from 1962, two from 1965 and one from 1966. The remaining data are from 1964. A plume contour of 1 pCi/L has reached beyond the central landfill in 1964. A plume contour of 5 pCi/L is somewhat less than

half way from PUREX to the central landfill. The iodine-129 plume appears to move on a longitudinal axis that swings north of the central landfill – like the tritium plume.

Of 71 data points from the 1970s, one is from 1972, eight from 1973, thirty-five from 1974, seven from 1975, three from 1976, five from 1977, ten from 1978, and two from 1979. Of, the positive data 20 of 37 are from 1974. The 1970s decadal map shows the 1 pCi/L contour two-thirds of the way to the Columbia River. The 5 pCi/L contour is somewhat beyond the central land fill. Arrival at the central landfill location of the 5 pCi/L contour likely occurred in the early 1970s. The center of mass of the iodine-129 is approximately adjacent to the central landfill in 1974.

Of 19 positive data from the 1980s, 10 are from 1985. By the 1980s the iodine-129 plume is dispersing widely as it approaches the Columbia River, much like the tritium plume has done. The 1 pCi/L contour is within ~4 km of the river, and the 5 pCi/L contour is approximately half way between PUREX and river. The center of mass appears to be beyond the central landfill; however, the plume concentrations are dropping as the iodine from the 1956-1972 campaign is dispersing and the groundwater flow slowly spreads the contaminant laterally in the aquifer.

The analysis of field data by Murray, Chien and Thorne (see below) determined the iodine-129 center of mass in 1992 was beyond the central landfill by ~3 to 4 km. This is consistent with its earlier arrival at the central landfill and broad dispersal as it moves toward the river.

Analysis of Iodine Field Data by Murray, Chien, and Thorne

A geostatistical analysis of field data included an analysis of iodine-129 groundwater contaminant concentrations and their areal distribution. Two metrics of the iodine-129 data from this analysis are the estimated mass or activity of iodine129 in the aquifer, and its center of mass. The analysis examined field data at two times 1992 and 2001. For iodine-129, plumes in three regions of the Hanford Site were examined. They are a plume in the vicinity of the REDOX plant located to the southeast of 200 West Area, a plume to the northwest of 200 East Area, and a plume to the south-southeast of 200 East Area.

Plume mass or activity was calculated assuming that the aquifer thickness that is contaminated at sampled levels is 5, 10, 15, or 20 meters thick below the water table. The tables below show the mean, median, minimum and maximum values simulated using the krigged data for each of the substantial plumes of iodine-129.

Note that relatively little iodine-129 was introduced to the aquifer during the period between the 1992 and 2001 field data. Therefore, the mass in the aquifer should be virtually static between 1992 and 2001. Also note that the geostatistical methods applied treat unsampled regions within a groundwater contaminant plume that lie between two sample points in an unbiased way. For example, one might know the plume has historically been of higher concentration between two known points, but, since the

intermediate point has not been sampled, this knowledge can not be imparted to the krigging algorithm. The result is an underestimated contaminant concentration between the two sample points, an underestimated contaminant mass, and a somewhat flawed calculation of the center of mass.

Table of Iodine-129 Activity (Ci) for a Contaminated Thickness of 5, 10, 15, and 20 meters Southeast of 200 West Area.

FY1992 Iodine-129 – Southeast of 200 West Area – REDOX				
	5	10	15	20
Mean	0.0633	0.1190	0.1708	0.2195
Median	0.0584	0.1092	0.1574	0.2029
Minimum	0.0186	0.0376	0.0545	0.0700
Maximum	0.1620	0.2986	0.4299	0.5514

Mean Easting 569301, Northing 134376
Median Easting 569268, Northing 134343

FY2001 Iodine-129 – Southeast of 200 West Area – REDOX				
	5	10	15	20
Mean	0.0788	0.1506	0.2187	0.2833
Median	0.0744	0.1443	0.2096	0.2732
Minimum	0.0255	0.0492	0.0718	0.0935
Maximum	0.1729	0.3324	0.4920	0.6442

Mean Easting 569214, Northing 134344
Median Easting 569182, Northing 134340

It is believed this iodine-129 plume originated with process condensate discharges from the REDOX facility from 1952 until 1967. Given the unknown depth of the contaminant plume, the belief that krigging will underestimate contaminant mass in a sparsely sampled plume, and the difference in the mass estimated from 1992 and 2001 data – a target inventory in aqueous phase in the aquifer disposed from REDOX in process condensate is assumed to be approximately 0.2 curies.

Table of Iodine-129 Activity (Ci) for a Contaminated Thickness of 5, 10, 15, and 20 meters South-Southeast of 200 East Area.

FY1992 Iodine-129 – South-Southeast of 200 East Area – PUREX				
	5	10	15	20
Mean	0.4518	0.8100	1.1292	1.4100
Median	0.4412	0.7917	1.1084	1.3718
Minimum	0.2570	0.4520	0.6157	0.7525
Maximum	0.8692	1.5761	2.1807	2.6966

Mean Easting 583217, Northing 132781
Median Easting 583139, Northing 132846

FY2001 Iodine-129 – South-Southeast of 200 East Area – PUREX				
	5	10	15	20
Mean	0.1979	0.3569	0.4976	0.6145
Median	0.1935	0.3495	0.4885	0.5992
Minimum	0.0863	0.1546	0.2151	0.2687
Maximum	0.3854	0.7092	0.9948	1.2212

Mean Easting 583567, Northing 132677
Median Easting 583564, Northing 132701

The iodine-129 plume that lies to the south-southeast of 200 East Area appears to have originated from process condensate discharges associated with PUREX operation between 1956 and 1972, and later between 1983 and 1988. Like the 200 West Area plume, it is believed that little additional iodine-129 has been introduced to the aquifer between 1992 and 2001; however, the cribs at PUREX continue to drain pore water into the water table and it carries some iodine-129. Unlike the 200 West Area plume, the plume to the south-southeast of PUREX discharges to the Columbia River, and, therefore, it possible that contaminant mass is being lost from the aquifer. Accordingly, the earlier estimate (from 1992) should be relied upon more heavily than the later estimate (2001). Given the unknowns and uncertainties listed above for the REDOX plume, the PUREX source of iodine-129 is estimated to have resulted in an aqueous phase mass of approximately 1.2 curies, ~1.1 curies are south-southeast of PUREX and ~0.1 curies are northwest of PUREX.

Table of Iodine-129 Activity (Ci) for a Contaminated Thickness of 5, 10, 15, and 20 meters Northwest of 200 East Area.

FY1992 Iodine-129 – Northwest of 200 East Area – PUREX				
	5	10	15	20
Mean	0.0534	0.0960	0.1305	0.1595
Median	0.0440	0.0783	0.1052	0.1285
Minimum	0.0044	0.0071	0.0091	0.0110
Maximum	0.2417	0.4418	0.6147	0.7582

Mean Easting 571788, Northing 140647
Median Easting 571801, Northing 140590

FY2001 Iodine-129 – Northwest of 200 East Area – PUREX				
	5	10	15	20
Mean	0.0424	0.0778	0.1076	0.1333
Median	0.0405	0.0746	0.1030	0.1281
Minimum	0.0084	0.0155	0.0214	0.0266
Maximum	0.1025	0.1896	0.2592	0.3174

Mean Easting 571816, Northing 141075
Median Easting 571798, Northing 141082

As a further check on this first order estimate of the iodine-129 source from REDOX and PUREX, the estimated REDOX source of 0.2 curies in the aqueous phase can be scaled up to represent the PUREX source. Assuming the origin of iodine-129 from PUREX is similar to that from REDOX, the PUREX release of iodine-129 can be estimated from the known processing of uranium. REDOX processed 21,459 short tons of uranium while PUREX processed 78,584 short tons (Agnew 1997). Approximately 21.4% of the total is REDOX process while 78.6% is PUREX. Accordingly, if REDOX generated a crib release of 0.2 curies of iodine-129, then PUREX should have released on the order of 0.73 curies. While lower than the 1.2 curie PUREX release estimate based on interpretation of the krigged observations, this is less that a factor of two different and essentially equivalent.

Iodine Retardation Factor and Distribution Coefficient

We take the temporal center-of-mass year from the 1956-1972 PUREX campaign processing as 1963 – and assume that it is indicative of the center of mass of the release. Accordingly, the time of travel of the center of mass of the iodine plume to the central landfill is approximately 11 years.

Field data from the second PUREX campaign is useful for estimating the tritium time of travel to the central landfill. The temporal center-of-mass of the processing was 1985, and it is assumed to also represent the temporal center-of-mass of the release to process condensate and other PUREX cribs. The center of mass of the tritium pulse from the second campaign appears to pass the central landfill in approximately 1990. Accordingly, the time of travel of the center of mass of tritium is approximately 5 years.

The approximate retardation factor for iodine is the time of travel for iodine-129 divided by the time of travel for tritium. This ratio is approximately 11 years to 5 years or 2.2. Using a ratio of sediment bulk density to effective porosity of 7.95 g/cm^3 (porosity = 0.25, solid density = 2.65 g/cm^3, and bulk density = 1.9875 g/cm^3) obtained from prior SAC simulations, the associated field scale K_d of iodine would be approximately 0.15 mL/g. A somewhat shorter tritium travel time, or a longer iodine travel time would yield a somewhat higher retardation factor and distribution coefficient. For example, if the tritium travel time were 4.6 years (1990 - 1985.4) and the iodine travel time were 11 years (1974 – 1963), the retardation factor would be 2.4, and the distribution coefficient would be 0.18.

Estimated Iodine-129 Discharge from REDOX and PUREX

The estimate of iodine-129 released from REDOX and from PUREX is a function of the estimated aqueous mass of iodine-129 and the estimated field-scale retardation factor of iodine. Since iodine-129 is sorbed in the environment, the total inventory released to cribs is a combination of the quantity seen in aqueous phase in groundwater, and the quantity sorbed onto the sediments in the vadose zone and groundwater. A third component in the mass balance is the quantity already discharged to the Columbia River. Because iodine is sorbed, and considering that its half life is so long as to appear non-

decaying, and the center of mass of the iodine plume from the first campaign of PUREX (1956 – 1972 has not reached the river, it is apparent that relatively little of the iodine-129 has discharged into the river. Thus, a first order estimate of the iodine-129 released from REDOX is 0.2 curies in aqueous phase * 2.2 = 0.44 curies. A first order estimate of the iodine-129 released from PUREX between 1956 and 1988 is 1.2 curies x 2.2 = 2.64 curies. The overall estimate of releases from process condensate at both REDOX and PUREX is approximately 3.1 curies based on the aqueous phase quantity in groundwater and a retardation factor of ~2.2. Note, if the retardation factor were ~2.4 the estimated discharge for REDOX and PUREX would be ~3.4 curies.

These inventory estimates have not considered the quantity of iodine-129 that may reside in the vadose zone – and assuming iodine sorbs, there certainly would be iodine-129 in the vadose zone. However, the vadose zone is ~100 m thick and the contaminated groundwater areal extent is on the order of kilometers. Thus, it is assumed that the vadose zone inventory lies with the uncertainty of the groundwater based estimate, and the vadose zone contribution will be neglected in this first order estimate.

Appendix G

SIM Sites Other than Tank Leaks and Unplanned Releases

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Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CB-1	200-E-100	1945-1998	2.37E-01	63	Assumes average 0.5 L loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site volume is given 50% variability. Although there is no specific waste stream designation in WIDS (DOE-RL 2002), bismuth phosphate and B Plant cooling water are considered to be the best waste streams to represent this situation by reason of this site's proximity to B Plant and the very low levels of contamination observed in the field.
200-EA-1	200-E-103	1960	4.00E-03	1	SGW-60540 is to be checked for background information. WIDS (DOE-RL 2002) describes a past release from a diversion box that was further spread by recharge. The volume estimate is assigned by assuming the average of the UPR volumes. Because of the indefinite nature of the volume description, this site volume is given 50% variability. Although there is no specific stream designation, PUREX stack drainage is assumed to be a reasonable representation of this site because of how the release originated (i.e., uncontaminated water contacting prior PUREX waste contamination) and its proximity to PUREX.
200-CP-1	200-E-107	2000	4.00E-03	1	WIDS (DOE-RL 2002) describes a consolidated contamination area that was the result of many years of PUREX operations. Decontamination waste is assumed to be a reasonable representation of this site because of the content of the WIDS narrative (DOE-RL 2002) and the site proximity to PUREX. The volume estimate is assigned by assuming the average of the UPR volumes. Because of the indefinite nature of the volume description, this site volume is given 50% variability.
200-EA-1	200-E-25	1971-1991	7.39E-02	20	SGW-60540 is to be checked for background information. WIDS (DOE-RL 2002) describes a french drain structure that received floor and sink waste from B Plant. Because of this source and the activity level described in the surveillance information, B Plant stack drainage is considered to be the appropriate representation of the waste. An average 10 L/day is considered to be a reasonable flowrate. Because of the indefinite nature of the volume description, this site volume is given 50% variability.
200-CB-1	200-E-28	1990	5.86E-01	155	WIDS (DOE-RL 2002) describes a loss situation where 80,000 to 230,000 gal of waste was lost. The average of those values is used as the loss volume with 50% variability applied. Because of the source and the activity level described in the surveillance information, the mixture of B Plant steam condensate and other waste lost is considered to be best described as B Plant stack drainage.
200-EA-1	200-E-4	1958-1959	1.75E-02	5	SGW-60540 is to be checked for background information. There is no contamination noted associated with this waste or disposal site and the processing association mentioned in WIDS (DOE-RL 2002) with the Critical Mass Lab presumes

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	200-E-41	1949-1992	2.20E-02	6	SGW-60540 is to be checked for background information. Hot Semiworks and B Plant cooling water are presumed to be the principal waste streams because the site's proximity to B Plant, the timing of the releases, and because of the lack of contamination indicated from surveillance. Assumes a 500 L/yr loss. Because of the indefinite nature of the volume description, this site is given 50% variability.
200-EA-1	200-E-54	1991	2.01E-01	53	SGW-60540 is to be checked for background information. Although there is no specific stream designation, PUREX stack drainage is assumed to be a reasonable representation of this site because of how the release originated (i.e., uncontaminated water contacting prior PUREX waste contamination) and its association with PUREX. WIDS (DOE-RL 2002) describes a final loss situation of 53,000 gal from a raw water line break contacting PUREX ductwork. The reference information also presents an initial estimate of 100,000 gal over a 21-month span. In this case, the smaller volume is assumed, but the loss is consolidated into a 1-year timeframe and assigned a 25% uncertainty.
200-CB-1	200-E-55	1945-1997	2.31E-01	61	Although there is no specific waste stream designation from WIDS (DOE-RL 2002), bismuth phosphate and B Plant cooling water are considered to be the best waste streams to represent this situation by reason of this site's proximity to B Plant and the very low levels of contamination observed in the field. Assumes an average 0.5 L loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability.
200-EA-1	200-E-56	1957	7.55E-02	20	SGW-60540 is to be checked for background information. High-level Hot Semiworks waste is the waste stream assigned assumed from surveillance information (>100 rad/hr at 15 ft) and the timing of the loss presented in WIDS (DOE-RL 2002). Assumes 8,000 ft^3 (20×20×20 ft) contamination volume with 33% void space. Because of the indefinite nature of the volume description, this site is given 50% variability.
200-EA-1	200-E-57	1957	1.13E-01	30	SGW-60540 is to be checked for background information. High-level Hot Semiworks waste is the waste stream assigned assumed from surveillance information (>100 rad/hr at 15 ft) and the timing of the loss presented in WIDS (DOE-RL 2002). Assumes 12,000 ft^3 (30 x 20 x 20 ft) contamination volume w/ 33% void space. Because of the indefinite nature of the volume description, this site is given 50% variability.
WMA B-BX-BY	200-E-60	1957	5.20E-03	1	WIDS (DOE-RL 2002) describes a site (e.g., an inactive miscellaneous underground storage tank) with a volume of 2,741 gal that contained decontamination waste. However, there is no description of the actual contents; thus, the tank is assumed to have been 50% filled and this volume has a 50% uncertainty. Past practice use makes assigning decontamination waste the logical choice for the waste stream.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
Pu kg Table 7	200-E-61	1955-2001	1.80E+00	476	Assumes average rainfall of 6.5 in./yr and a 50×50 ft area over the site history presented in WIDS (DOE-RL 2002). Because of the indefinite nature of the volume description, this site is given 50% variability. Because of the site's proximity and presumed prior contamination, PUREX stack drainage is selected as the most appropriate waste stream.
200-CP-1	200-E-62	1955-1996	1.84E-01	49	Assumes average 0.5 L loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability. Because of this site's proximity to PUREX and because WIDS (DOE-RL 2002) presents this waste as sanitary water steam condensate, PUREX cooling water is considered to be the best waste stream to represent this situation (e.g., low levels of contamination).
200-CP-1	200-E-63	1955-1996	1.84E-01	49	
200-CP-1	200-E-64	1955-1996	1.84E-01	49	
200-CP-1	200-E-65	1955-1996	1.84E-01	49	
200-CP-1	200-E-67	1955-1996	1.84E-01	49	
200-EA-1	200-E-68	1955-1996	1.84E-01	49	SGW-60540 is to be checked for background information.
200-CP-1	200-E-69	1955-1997	1.88E-01	50	
200-CP-1	200-E-70	1955-1997	1.88E-01	50	
200-CP-1	200-E-71	1955-1997	1.88E-01	50	
200-CP-1	200-E-72	1955-1997	1.88E-01	50	
200-CP-1	200-E-73	1955-1996	1.84E-01	49	
200-CP-1	200-E-74	1955-1997	1.88E-01	50	
200-CP-1	200-E-75	1955-1997	1.88E-01	50	
200-CP-1	200-E-76	1955-1997	1.88E-01	50	
200-CP-1	200-E-77	1955-1997	1.88E-01	50	
200-CP-1	200-E-78	1955-1996	1.84E-01	49	
200-CP-1	200-E-79	1955-1997	1.88E-01	50	
200-CP-1	200-E-80	1955-1996	1.84E-01	49	

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CP-1	200-E-81	1965-1997	4.56E-01	120	Assumes average 10 gal loss/day throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability. Because of this site's proximity to PUREX and WIDS (DOE-RL 2002) presents this waste originating from a potable water drain, PUREX cooling water is considered the best waste stream to represent this situation (e.g., low levels of contamination).
200-EA-1	200-E-82	1955-1997	1.88E-01	50	SGW-60540 is to be checked for background information. Assumes average 0.5 L loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability. Because of this site's proximity to PUREX and because WIDS (DOE-RL 2002) presents this waste as sanitary water steam condensate, PUREX cooling water is considered the best waste stream to represent this situation (e.g., low levels of contamination).
200-CP-1	200-E-84	1955-1996	2.53E-01	67	Assumes average 0.5 L loss/hr throughout operating history and assumes additional 7-in. runoff over 10×10 ft area. Because of the indefinite nature of the volume description, this site is given 50% variability. Because of this site's proximity to PUREX and because WIDS (DOE-RL 2002) presents this waste as sanitary water steam condensate, PUREX cooling water is considered the best waste stream to represent this situation (e.g., low levels of contamination).
200-CB-1	200-E-85	1955-1997	1.43E+00	378	Assumes average 1 gal loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability. WIDS (DOE-RL 2002) reports that this site received PUREX pump seal water; PUREX stack drainage is considered the best waste stream to represent this situation.
200-CB-1	200-E-88	1945-1997	2.32E-01	61	Assumes average 0.5 L loss/hr throughout operating history. Because of the indefinite nature of the volume description, this site is given 50% variability. Because of this site's proximity to B Plant and because WIDS (DOE-RL 2002) reports this waste as originating from sanitary water steam condensate, bismuth phosphate and B Plant cooling water are considered the best waste streams to represent this situation (e.g., low levels of contamination).
200-CB-1	200-E-89	1945-1997	2.32E-01	61	
200-CB-1	200-E-90	1945-1997	2.32E-01	61	
200-CB-1	200-E-91	1945-1997	2.32E-01	61	
200-CB-1	200-E-92	1945-1997	2.32E-01	61	
200-CB-1	200-E-93	1945-1997	2.32E-01	61	
200-EA-1	200-E-94	1945-1997	2.32E-01	61	SGW-60540 is to be checked for background information.
200-EA-1	200-E-95	1945-1994	2.19E-01	58	SGW-60540 is to be checked for background information.
200-CB-1	200-E-97	1945-1997	2.32E-01	61	
200-CB-1	200-E-98	1945-1997	1.92E-01	51	

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CB-1	200-E-99	1945-1998	2.37E-01	63	
200-WA-1	200-W-22	1952-1983	3.20E-05	0	Assumes removal of most contamination and a persistent residue of 1 L/yr from the qualitative description in WIDS (DOE-RL 2002). Because of the indefinite nature of the volume description, this site is given 50% variability. The 203-S and 205-S facilities process UNH from REDOX. Concentrated UNH waste is represented in SIM as a process condensate.
200-WA-1	200-W-42	1952-1988	1.11E-02	3	Assumes most (99%+) of the discharge volume is in 216-U-8 and 216-U-12 and nominal losses occurred end-route during operating history presented in WIDS (DOE-RL 2002). The loss volume was estimated by assuming a volume element equivalent to a cylindrical surface area associated with the pipeline (2,119 ft), a 1-in. depth and 33% porosity linearized over the operating lifetime of the cribs (37 years). Because of the indefinite nature of the volume description, this site is given a 50% variability. Dilute UNH U Plant process condensates are assumed to be the best representation of the waste lost among the collective streams sent to those sites because of the preponderance of volume.
Pu kg Table 7	200-W-72	2000	3.04E-02	8	WIDS (DOE-RL 2002) describes a loss situation where 23,000 gal of waste was lost and 15,000 gal of waste was recovered. The difference of those values is used as the loss volume with 50% variability applied. Because of this site's proximity to the 231-Z pump and treat groundwater system, Z Complex stack drainage is considered to be the best description of waste for this site.
200-WA-1	200-W-9	1994	1.36E-01	36	WIDS (DOE-RL 2002) describes an abandoned pipeline that carried chemical sewer effluent from various T Plant facilities. A contaminated volume was calculated along the line length (500 m) and soil depth (3 ft) with a soil porosity of 33%, with no excluded volume. Because of the indefinite nature of the volume description, this site is given 50% variability. Although the pipeline is assumed to carry chemical sewer wastes, activity detected during surveillance and T Plant's longer term mission suggests that decontamination waste is a more appropriate choice.
200-WA-1	200-W-PP	1984-1995	3.41E+03	900,925	WIDS (DOE-RL 2002) describes the Powerhouse pond as part of the 216-U-14 ditch. However, for modeling purposes, both 200-W-PP and 216-U-14 have been maintained as separate entities. It received 75,000,000 gal/yr and this value is not pro-rated. Because of the definite nature of the disposal volume, a 10% uncertainty was applied to the volume estimates. The source of the waste stream is indicated as Powerhouse waste water.
200-OA-1	2101-M-Pond	1953-1995	1.11E+03	293,263	WIDS (DOE-RL 2002) describes this site as receiving process water from the facility air conditioning system, storm water runoff, steam traps, and laboratory wastes. A typical flowrate is considered to be 18,750 gal/day (DOE/RL-88-21). The uncertainty associated with this volume is considered to be moderate (25%; 1988-1995) to high (50%; 1953-1987) over the operation of the site. PUREX cooling water and 222-S Laboratory waste water are considered to be the best waste streams to represent the situation at this site.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-1	1955	9.84E-02	26	SGW-60540 is to be checked for background information. This site received 26,000 gallons PUREX cold start waste. The uncertainty associated with this volume is considered low (10%). PUREX cold start waste is represented as a HDW P1 waste stream with no radionuclides except for the uranium. A modest amount of entrained solids (0.3%) is considered present because of the large uranium inventory associated with this site.
200-EA-1	216-A-10	1956; 1961-1988	3.16E+03	834,875	SGW-60540 is to be checked for background information. This site received ~3,161 mL of PUREX process condensate/cooling water. The contributing volumes can be found in the following documents and the uncertainties are considered low (10%) except where noted: HW-44784; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98 = 472.71 or ARH-2806, 4Q = 388; assume summary values (ARH-2806, 4Q) reconciled and correct-increase uncertainty from 10% to 25%; ISO-698 : ARH-486: ARH-1159 = 68.18; ARH-2806, 4Q = 258; assume summary values correct--increase uncertainty from 10% to 25%; ARH-1608 = 30.84; ARH-2806, 4Q = 117; assume summary values correct--increase uncertainty from 10% to 25%; ARH-2015 Pt3 = 12.9; ARH-2806, 4Q = 48.8; assume summary values correct--increase uncertainty from 10% to 25%; ARH-2353 Pt3 = 176; ARH-2806, 4Q = 66.8; assume summary values correct--increase uncertainty from 10% to 25%; ARH-2757 Pt3; ARH-2806, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; and WHC-EP-0141. This waste is categorized as spent nitric acid.
200-CP-1	216-A-11	1956-1972	1.00E-01	26	This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume was linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX cooling water is considered to be the best waste stream to represent this situation (e.g., steam condensate and equipment leakage).
200-CP-1	216-A-12	1955-1972	1.00E-01	26	
200-CP-1	216-A-13	1956-1961	1.00E-02	3	This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX stack drainage is considered to be the best waste stream to represent this situation (e.g., seal water).
200-CP-1	216-A-14	1956-1972	1.00E-03	0.264	This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX stack drainage is considered to be the best waste stream to represent this situation (e.g., pit drainage).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-15	1955-1972	1.00E+01	2,642	SGW-60540 is to be checked for background information. This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX cooling water is considered to be the best waste stream to represent this situation (e.g., steam condensate and equipment leakage).
WMA A-AX	216-A-16	1956-1969	1.22E-01	32	This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX stack drainage is considered to be the best waste stream to represent this situation (e.g., floor and stack drainage).
WMA A-AX	216-A-17	1956-1969	6.00E-02	16	This site received PUREX miscellaneous drainage over a number of years. A total volume is recorded; however, there are no annual values. The volume is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. PUREX stack drainage is considered to be the best waste stream to represent this situation (e.g., floor and stack drainage).
200-EA-1	216-A-18	1955	4.88E-01	129	SGW-60540 is to be checked for background information. This site received 488,000 L PUREX cold start waste (ARH-2806, 4Q). The uncertainty associated with this volume is considered low (10%). PUREX cold start waste is represented as a HDW P1 waste stream with no radionuclides except for the uranium. A modest amount of entrained solids (0.3%) is considered present because of the large uranium inventory associated with this site.
200-EA-1	216-A-19	1955	1.10E+00	291	SGW-60540 is to be checked for background information. This site received 1,100,000 L PUREX cold start waste (ARH-2806, 4Q). The uncertainty associated with this volume is considered low (10%). PUREX cold start waste is represented as a HDW P1 waste stream with no radionuclides except for the uranium. A substantial amount of entrained solids (9%) is considered present because of the large uranium inventory associated with this site.
200-EA-1	216-A-2	1956-1960	2.30E-01	61	SGW-60540 is to be checked for background information. This site received 230,000 L of PUREX organic waste. The contributing volumes can be found in the following documents, and the uncertainties associated with these volumes are considered low (10%): HW-44784; HW-53336; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; and RHO-CD-673 (total volume). The composition for PUREX organic waste is derived from HW-31000 and RPP-19822.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-20	1955	9.61E-01	254	SGW-60540 is to be checked for background information. This site received 961,000 L PUREX cold start waste and PUREX process condensate. The contributing waste types and total volumes can be found in the following references: ARH-2806, 4Q and RHO-CD-673. There is no specific breakout between the waste types presented; therefore, they are allocated according to their respective uranium inventory contributions, with a modest amount of entrained solids (1%) as part of the cold start description. Because of this method of volume allocation, both volume estimates have uncertainties of 25%.
200-EA-1	216-A-21	1957-1965	7.79E+01	20,581	SGW-60540 is to be checked for background information. This site received 77.9 mL of PUREX caustic scrubber waste. The contributing volumes can be found in the following documents and the uncertainties are considered low (10%): HW-55593; HW-57649; HW-63646; HW-64375; HW-69071; HW-69072; RHO-CD-673; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; and ARH-2806, 4Q.
200-EA-1	216-A-22	1956-1959	9.99E-03	3	SGW-60540 is to be checked for background information. This site received approximately 10,000 L of various PUREX process UNH wastes and steam condensates. A total volume is recorded; however, there are no annual values. The volume presented in WIDS (DOE-RL 2002) is linearized over the operating history to provide annual volumes. Their proportions are allocated 50%/50% between concentrated and dilute uranium content. The dilute waste contributions are then split again 50%/50%. Because of this method of volume allocation and assignment, the volume uncertainties are 50%.
WMA A-AX	216-A-23A	1957-1969	2.99E-03	1	This site is assumed to have received 50% of the WIDS (DOE-RL 2002) volume (6,000 L) of PUREX tank farm condensate. A total volume is recorded; however, there are no annual values. The volume presented in WIDS (DOE-RL 2002) is linearized over the operating history to provide annual volumes. Because of this method of volume allocation, an uncertainty of 25% is assigned.
WMA A-AX	216-A-23B	1957-1969	2.99E-03	1	
200-PW-3	216-A-24	1958-1967; 1971-1976; 1978	8.21E+02	216,909	This site received 820 mL of PUREX tank farm condensate. The contributing volumes can be found in the following documents and the uncertainties are considered low (10%): HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; and ARH-2806, 4Q. Additionally, a small amount of collateral loss from 216-A-8 of PUREX organic waste is estimated to be present after this site was removed from active service. This condition is represented using a skewed triangular distribution assuming a maximum 50% diversion.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CW-1	216-A-25	1958-1985	2.94E+05	77,675,033	Gable Mountain Pond received almost 294,000 mL of non-contact or lightly contaminated process waste over its operating lifetime (e.g., PUREX and B Plant process cooling water; Powerhouse water), with an excursion of high level waste. The contributing volumes can be found in these documents: HW-55593; HW-59359; HW-57649; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698 : ARH-486: ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; and RHO-HS-SR-85-3 4Q LIQ P. The uncertainties for most of these contributions are considered low (10%); however, some of them are moderate (25%) or high (50%) because of potential volume allocation issues related to nomenclature (e.g., consolidating the volumes associated with several differently labeled waste streams under one generic label).
200-EA-1	216-A-26	1965-1991	3.86E-03	1	SGW-60540 is to be checked for background information. The french drain at this site received PUREX floor and stack drainage. No site waste volume is recorded. The annual volume discharge estimated for site 216-A-26A is assumed to provide annual volumes for this site resulting in an estimated total volume of slightly more than 1,000 gal. Because of this method of volume allocation, an uncertainty of 50% is assigned.
200-EA-1	216-A-26A	1959-1965	1.00E-03	0	SGW-60540 is to be checked for background information. The french drain at this site received PUREX floor and stack drainage. A total volume of 1,000 L is presented in WIDS (DOE-RL 2002) and is linearized over the operating history of the site. Because of this method of volume allocation, an uncertainty of 25% is assigned.
200-EA-1	216-A-27	1965-1970	2.32E+01	6,129	SGW-60540 is to be checked for background information. This site received PUREX stack drainage and laboratory cell waste. The majority of the waste is assumed to be PUREX stack drainage, with a small fraction of laboratory cell waste assumed to resemble PL1, including a solids contribution represented by an asymmetric triangular distribution. The uncertainties for the volumes associated with stack drainage are assumed to be low (10%) unless otherwise noted. The estimated laboratory cell drainage volumes are assumed to be high (50%) and are derived using the values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The annual contributing volumes can be found in the following documents: ISO-698; ISO-98; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3 = 0.277; ARH-2806, 4Q = 1.05; Site vol. = 23 mL from RHO-CD-673 and ARH-2806, 4Q; assume summary values correct--increase uncertainty for 1973 volume from 10% to 25%.
200-EA-1	216-A-28	1960	3.00E-02	8	SGW-60540 is to be checked for background information. The french drain at this site received PUREX UNH condensates. A total volume of 30,000 L is presented in WIDS (DOE-RL 2002) and is linearized over the operating history of the site. Because of this method of volume allocation, an uncertainty of 25% is assigned.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-3	1956-1966; 1976-1981	3.05E+00	806	SGW-60540 is to be checked for background information. This site received ~3 mL of PUREX UNH and silica gel regeneration waste. The majority of the waste is assumed to be PUREX UNH, with a small fraction of regeneration waste assumed to resemble PL1. No solids from the silica gel are assumed. The uncertainties for the volumes associated with UNH are assumed to be low (10%) unless otherwise noted. The estimated regeneration waste volumes are assumed to be high (50%) and are derived using the values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The annual contributing volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; and RHO-HS-SR-81-3 4Q LIQ. Where slight discrepancies are observed, the summary values are assumed to be correct and no increase to the uncertainty is attached; where the difference exceeds the uncertainty bounds, the summary value is still accepted, but the uncertainty is increased to reflect the discrepancy.
200-EA-1	216-A-30	1961-1991	7.64E+03	2,018,494	SGW-60540 is to be checked for background information. This site received approximately 7635 mL of PUREX condensate and miscellaneous drainage. The waste streams selected to represent the process history of this site are decontamination waste, PUREX chemical sewer, PUREX steam condensate, and PUREX stack drainage. The consolidated annual contributing volumes can be found in the following documents: HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; and WHC-EP-0527-1. The summary surveillance information also includes the diversion to 216-A-6 from 1966-1969. The uncertainties for most of these contributions are considered low (10%); however, the decontamination waste assignment is high (50%) because the basis assumed that stream is the source of most of the analyte inventories.
200-PW-3	216-A-31	1964; 1966	3.05E-02	8	This site has several conflicting sources regarding waste volume received. In evaluating the sources, the value considered most credible is 30,545 L of PUREX organic waste obtained from ARH-231. Other documents include BNWC-91 and ISO-698. In evaluating the sources, there is confusion regarding the units used to document volume in this case. Because of these irregularities, a moderate uncertainty (25%) is applied to the volume values.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CP-1	216-A-32	1959-1972	4.00E-03	1	This site received a total of 4,000 L of PUREX misc. drainage (sink, shower, and floor); thus, PUREX stack drainage is selected as the most appropriate representation. Although a total volume is recorded, there are no annual values. The volume presented in WIDS (DOE-RL 2002) is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description, this site is given a 50% variability.
200-CP-1	216-A-35	1963-1966	1.00E-02	3	This site received a total of 10,000 L of PUREX seal cooling water; thus, PUREX cooling water is selected as the most appropriate representation. Although a total volume is recorded, there are no annual values. The volume presented in WIDS (DOE-RL 2002) is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description, this site is given a 50% variability.
200-EA-1	216-A-36A	1965-1966	1.07E+00	283	SGW-60540 is to be checked for background information. This site received ~1 mL PUREX ammonia scrubber waste. The annual contributing volumes for this site can be found in ISO-98 and ISO-698. The uncertainty associated with these volumes is considered low (10%).
200-EA-1	216-A-36B	1966-1972; 1982-1987	3.15E+02	83,223	SGW-60540 is to be checked for background information. This site received ~315 mL PUREX ammonia scrubber waste. The annual contributing volumes for this site can be found in the following documents: ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; and WHC-EP-0141. The uncertainty associated with these volumes is considered low (10%).
200-EA-1	216-A-37-1	1978-1989	3.68E+02	97,226	SGW-60540 is to be checked for background information. This site received ~368 mL of 242-A Evaporator process condensate. The annual contributing volumes for this site can be found in the following documents: RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; and WHC-EP-0141-2. The uncertainty associated with these volumes is considered low (10%).
200-EA-1	216-A-37-2	1984-1986; 1988-1991	1.10E+03	290,621	SGW-60540 is to be checked for background information. This site received ~1,100 mL of PUREX steam condensate. The annual contributing volumes for this site can be found in the following documents: RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; and WHC-EP-0527-1. The uncertainty associated with these volumes is considered low (10%).
WMA A-AX	216-A-39	1966	2.00E-05	0	WIDS (DOE-RL 2002) indicates that this site received 20 L of PUREX high-level waste. This assignment is indicated by the location of the site and surveillance data (>5R at 10 ft). The uncertainty associated with this volume is considered low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-4	1955-1958	6.21E+00	1,641	SGW-60540 is to be checked for background information. This site received approximately 6.2 mL of UNH process condensate and PUREX laboratory waste. The annual contributing consolidated volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593; HW-59359; HW-63646; and HW-64375. There is no specific breakout between the waste types presented, but the majority of the waste volume is presumed to be UNH process condensate and these waste volume uncertainties are considered to be low (10%). The contribution of laboratory waste is represented as PL1 waste and appeared to be erratic over the history of the site. A modest amount of entrained solids is included as part of the laboratory waste description. These contributions are represented as asymmetric triangular distribution. The laboratory waste contributions are estimated using Cs-137, Sr-90, uranium, and Pu-239. The volume percent solids portion of the laboratory waste distribution has a maximum of 5%.
200-EA-1	216-A-40	1968-1979	9.46E-01	250	SGW-60540 is to be checked for background information. This site received 946,000 L of B Plant cooling water and steam condensate; however, there are discrepancies in the way the discharges occurred. RHO-CD-673 presents an operating history for the site from 1968-1979. ARH-CD-743, 4Q represents the total volume was discharged in 1968. In this case, a linearized annual volume over the operating history presented in RHO-CD-673 is assumed. Because of the indefinite nature of the volume estimates for this site, a high (50%) uncertainty is assigned.
200-EA-1	216-A-41	1968-1974	1.00E-02	3	SGW-60540 is to be checked for background information. WIDS (DOE-RL 2002) indicates that this site received a combination of PUREX stack drainage and process condensate. A total volume of 10,000 L was received; however, no annual volumes are documented, and there is no obvious way to allocate the comingled wastes. The total volume is linearized to provide annual volume contributions over the operating history. The more acidic wastes are assigned earlier in the process history; however, because of the limited information, a variety of quantitative descriptions and temporal arrangements are possible that result in the same inventory. Because of the indefinite nature of the volume estimates for this site, a high (50%) uncertainty is assigned.
200-EA-1	216-A-45	1987-1989	1.03E+02	27,213	SGW-60540 is to be checked for background information. This site received 103 mL of PUREX process condensates, steam condensate, and dilute UNH condensate. The annual contributing waste volumes can be found in the following documents: WHC-EP-0141; WHC-EP-0141-1; and WHC-EP-0141-2. The specific waste stream allocations are made using Cs-137, Sr-90, uranium, and Pu-239 inventory information and the corresponding analyte concentrations in the likely waste streams. Because of the significant differences in the compositions between the contributing waste types, uncertainties associated with these volumes are considered low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-5	1955-1961; 1966	1.63E+03	430,647	SGW-60540 is to be checked for background information. This site received ~1,633 mL of PUREX process condensate. The contributing volumes can be found in the following documents and the uncertainties are considered low (10%) except where noted: HW-44784 = 26.5 mL, assume reconciled volume is correct (ARH-2806, 4Q) and increase uncertainty from 10% to 50%; HW-48518; HW-53336; HW-55593 = 293 mL, assume reconciled volume is correct (ARH-2806, 4Q) and increase uncertainty from 10% to 50%; HW-57649; HW-59359; HW-63646; HW-69071; HW-69072; and ISO-698. This waste is categorized as spent nitric acid.
200-EA-1	216-A-6	1955-1961; 1966-1970	3.36E+03	887,715	SGW-60540 is to be checked for background information. This site received ~3,360 mL of PUREX condensate and miscellaneous drainage. The waste streams selected to represent the process history of this site are decontamination waste, PUREX chemical sewer, PUREX steam condensate, spent nitric acid, and PUREX stack drainage. The consolidated annual contributing volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; ISO-698; ARH-486; ARH-1159; ARH-1608; and ARH-2015 Pt3. The summary surveillance information also includes the diversion from 216-A-30 from 1966-1969. The uncertainties for most of these contributions are considered low (10%); however, the decontamination waste assignment is high (50%) because the basis assumed that stream is the source of most of the analyte inventories.
200-PW-3	216-A-7	1955-1956; 1966	3.27E-01	86	This site received ~330,000 L of PUREX misc. drainage. The PUREX tank farm condensate and PUREX organic wastes are considered to best represent this site, and their contributing volumes can be found in the following documents: HW-44784; HW-48518; and ARH-CD-743, 4Q. The uncertainties associated with these volumes are considered low (10%).
200-PW-3	216-A-8	1955-1958; 1966-1976; 1978; 1983-1985	1.15E+03	303,831	This site received 1,150 mL of PUREX tank farm condensate, PUREX organic waste, and PUREX cooling water. The contributing volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593 = 333 mL, assume reconciled value correct and increase uncertainty from 10% to 50%; HW-57649; ISO-698; ARH-486 with corrections from ARH-CD-743, 4Q and ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; and RHO-CD-78-34 4Q. Assumed 50/50 split between condensate and organic waste; RHO-HS-SR-83-3 4QLIQ-P; and RHO-HS-SR-84-3 4Q LIQ P. The uncertainties vary as a function of process history. Many of the uncertainties are low (10%); however, some of them are moderate (25%) or high (50%) because of potential volume allocation issues related to the changing character and proportions of the wastes disposed.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-A-9	1956-1958; 1966-1967	9.81E+02	259,181	SGW-60540 is to be checked for background information. This site received 980 mL of PUREX chemical sewer, cooling water, tank farm condensate, and N Reactor decontamination waste. The contributing volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593 = 582 mL assume reconciled volume is correct (ARH-CD-743 4Q) and increase uncertainty from 10% to 50%; HW-57649; ARH-486; and ARH-CD-743, 4Q. The uncertainties assigned to these volumes vary because of potential volume allocation issues related to the changing character and proportions of the waste disposed; thus, there is no consistent assignment.
200-EA-1	216-B-10A	1949-1952	9.98E+00	2,637	SGW-60540 is to be checked for background information. This site received ~10 mL of bismuth phosphate decontamination, floor drainage, and stack drain waste. ARH-CD-743, 4Q records volumes for the annual discharges; however, no breakout of the individual contributing waste streams is provided. In this case, an assumption of 1% decontamination waste with the most of the remainder stack drain appears to be appropriate. A modest UNH contribution is estimated using uranium to back calculate a reasonable volume. Because of the ambiguity in the component volumes, an uncertainty of 25% is assigned to the decontamination waste and stack drainage, and a 50% uncertainty is assigned to the UNH contribution.
200-EA-1	216-B-10B	1968-1973	2.80E-02	7	SGW-60540 is to be checked for background information. This site received ~28,000 L of bismuth phosphate decontamination waste. The contributing volumes can be found in the following documents: ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; and ARH-2806, 4Q. The uncertainties assigned to these volumes are low (10%).
200-DV-1	216-B-11A &B	1952-1954	2.96E+01	7,820	This site received 29.6 mL of 242-B Evaporator condensate and concentrate. The vast majority of waste disposed to this site is evaporator condensate; however, site inventories for various analytes suggest a small amount of evaporator concentrate carryover. The contributing volumes can be found in HW-33591 and HW-38562, and these volumes are considered to have low (10%) uncertainties. The carryover contribution is represented by an asymmetric triangular distribution with a maximum of 1000 L.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-B-12	1952-1957; 1967-1973	5.20E+02	137,384	SGW-60540 is to be checked for background information. This site received 520 mL of mostly TBP and B Plant condensates (e.g., 242-B Evaporator condensate, concentrated and dilute UNH wastes). Other high-level wastes are also noted or assumed to have contributed to the inventory at this site (1C Evaporator concentrate and decontamination waste). At the end of the site's operating history, it received B Plant cooling water. The annual total volumes are found in the following: HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; and ARH-2806, 4Q. The specific waste stream allocations are made using Cs-137, Sr-90, uranium, and Pu-239 inventory information and the corresponding analyte concentrations in the likely waste streams. Where only one waste stream is contributing or is specifically designated in the record, the uncertainty is considered low (10%). Uncertainties for multiple contributing waste volumes are considered moderate (25%). Where evaporator condensate is disposed, a small amount of 1C evaporator concentrate entrainment is assumed.
200-CB-1	216-B-13	1945-1976	2.10E-02	6	This site received a total volume of 21,000 L; however, no annual volumes are presented, so the total volume is linearized over the site operating history. Because of the indefinite nature of the volume description presented in WIDS (DOE-RL 2002), this site is given 50% variability. Bismuth phosphate and B Plant stack drainage are considered the most appropriate representations of this low-level waste.
200-BC-1	216-B-14	1956	8.67E+00	2,291	This site received 8.67 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-15	1956-1957	6.32E+00	1,670	This site received 6.32 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies result from the rework and process phasing.
200-BC-1	216-B-16	1956	5.60E+00	1,480	This site received 5.6 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) to moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-BC-1	216-B-17	1956	3.41E+00	901	This site received 3.41 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-18	1956	8.52E+00	2,251	This site received 8.52 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-19	1957	6.35E+00	1,678	This site received 6.35 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-20	1956	4.68E+00	1,236	This site received 4.68 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered high (50%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-21	1956	4.67E+00	1,234	This site received 4.67 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-22	1956	4.74E+00	1,252	This site received 4.74 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-BC-1	216-B-23	1956	4.52E+00	1,194	This site received 4.52 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-24	1956	4.87E+00	1,287	This site received 4.87 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-BC-1	216-B-25	1956	4.91E+00	1,297	This site received 4.91 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-BC-1	216-B-26	1956-1957	4.75E+00	1,255	This site received 4.748 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-BC-1	216-B-27	1957	4.42E+00	1,168	This site received 4.42 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-BC-1	216-B-28	1957	5.05E+00	1,334	This site received 5.05 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing.
200-BC-1	216-B-29	1957	4.83E+00	1,276	This site received 4.83 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CW-1	216-B-3	1945-1996	2.83E+05	74,768,824	This site received over 282,000 mL of bismuth phosphate process plant and B Plant cooling water; PUREX cooling water, chemical sewer, and stack drainage; and intermittent excursions of high-level waste. The annual contributing volumes can be found in the following documents: HW-28121; HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527-2; WHC-EP-0527-3; WHC-EP-0527-4; WHC-EP-0527-5; WHC-EP-0527-6; and WHC-EP-0527-7. The uncertainties for most of these contributions are considered low (10%) to moderate (25%) because of potential volume allocation issues related to nomenclature (e.g., consolidating the volumes with several differently labeled waste streams under one generic label).
200-BC-1	216-B-30	1957	4.78E+00	1,263	This site received 4.78 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-31	1957	4.85E+00	1,281	This site received 4.85 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-32	1956-1957	4.75E+00	1,255	This site received 4.754 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-BC-1	216-B-33	1956-1957	4.75E+00	1,255	This site received 4.75 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-34	1956-1957	4.88E+00	1,289	This site received 4.878 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-DV-1	216-B-35	1954	1.06E+00	280	This site received 1.06 mL of 1C waste. The contributing volumes can be found in HW-33591 = 0.962 mL; however, other documents (RHO-CD-673 and ARH-CD-743 4Q) support the 1.06 mL value. Because the discrepancy is within the range encompassed by a low uncertainty assignment, a 10% variability is assumed.
200-DV-1	216-B-36	1954	1.94E+00	513	This site received 1.94 mL of 1C waste. The contributing volumes can be found in HW-33591 = 1.77 mL; however, other documents (RHO-CD-673 and ARH-CD-743 4Q) support the 1.94 mL value. Because the discrepancy is within the range encompassed by a low uncertainty assignment, a 10% variability is assumed.
200-DV-1	216-B-37	1954	4.32E+00	1,141	This site received 4.32 mL of 1C waste. The contributing volumes can be found in HW-33591 = 4.3 mL, and other documents (RHO-CD-673 and ARH-CD-743 4Q) concur. The uncertainty associated with this volume is considered to be low (10%).
200-DV-1	216-B-38	1954	1.43E+00	378	This site received 1.43 mL of 1C waste. The contributing volumes can be found in HW-33591 = 1.5 mL; however, other documents (RHO-CD-673 and ARH-CD-743 4Q) support the 1.43 mL value. Because the discrepancy is within the range encompassed by a low uncertainty assignment, a 10% variability is assumed.
200-DV-1	216-B-39	1953-1954	1.54E+00	407	This site received 1.54 mL of 1C waste. The contributing volumes can be found in HW-38562 = 1.54 mL, and other documents (RHO-CD-673 and ARH-CD-743 4Q) concur. The uncertainty associated with this volume is considered to be low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CB-1	216-B-4	1945-1949	1.00E-02	3	WIDS (DOE-RL 2002) indicates that this site received a blending of bismuth phosphate stack drainage. A total volume of 10,000 L was received; however, no annual volumes are documented and there is no obvious way to allocate the comingled wastes. The total volume is linearized to provide annual volume contributions over the operating history. Because of the indefinite nature of the volume estimates for this site, a moderate (25%) uncertainty was assigned.
200-DV-1	216-B-40	1954	1.64E+00	433	This site received 1.64 mL of 1C waste. The contributing volumes can be found in HW-38562 = 1.716 mL; however, other documents (RHO-CD-673 and ARH-CD-743 4Q) support the 1.64 mL value. Because the discrepancy is within the range encompassed by a low uncertainty assignment, a 10% variability is assumed.
200-DV-1	216-B-41	1954	1.44E+00	380	This site received 1.44 mL of 1C waste. The contributing volumes can be found in HW-38562 = 1.51 mL; however, other documents (RHO-CD-673 and ARH-CD-743 4Q) support the 1.44 mL value. Because the discrepancy is within the range encompassed by a low uncertainty assignment, a 10% variability is assumed.
200-DV-1	216-B-42	1954	1.50E+00	396	This site received 1.5 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-43	1954	2.12E+00	560	This site received 2.12 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-44	1954-1955	5.60E+00	1,480	This site received 5.6 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-45	1955	4.92E+00	1,300	This site received 4.91 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-46	1955	6.70E+00	1,770	This site received 6.7 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-DV-1	216-B-47	1955	3.68E+00	972	This site received 3.68 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-48	1955	4.09E+00	1,081	This site received 4.09 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-DV-1	216-B-49	1955	6.70E+00	1,770	This site received 6.7 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered low (10%) because no potential waste allocation discrepancies resulting from rework and process phasing are observed.
200-DV-1	216-B-5	1945-1947	3.21E+01	8,481	This site received a total of 32 mL of 224 and 5-6 waste from the bismuth phosphate process. Although annual values are recorded in ARH-CD-743, 4Q, there is no breakout between the two wastes. Their respective contributions are estimated using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Because of the indefinite nature of the volume description, this site is given a 25% variability.
200-DV-1	216-B-50	1965-1974	5.47E+01	14,452	This site received ~55 mL of ITS evaporator condensate and BY saltcake. The vast majority of the waste disposed to this site is evaporator condensate; however, the site inventories for various analytes suggest a small amount of BY saltcake carryover. The contributing volumes can be found in the following documents: ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; and ARH-3093, 4Q; and these volumes are considered to have low (10%) uncertainties. The carryover contribution is represented by an asymmetric triangular distribution with a maximum of 100 L.
200-EA-1	216-B-51	1956-1958	1.00E-03	0	This site is a small french drain that received 1,000 L of ferrocyanide flush drainage. The total volume disposed is documented in DOE/RL-92-05, but no annual volumes have been found; thus, the total volume is linearized over the site operating history. Because of the indefinite nature of the volume description, this site is given a 25% variability.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-BC-1	216-B-52	1957-1958	8.53E+00	2,254	This site received 8.53 mL of ferrocyanide waste as part of the scavenging campaign. The contributing volumes can be found in GE 1958. The uncertainties for these volumes are considered moderate (25%) because of potential waste allocation discrepancies resulting from rework and process phasing. Scaling inconsistencies are observed in the Cs-137, Sr-90, uranium, and Pu-239 inventories, and allowing the contributing volumes more latitude is considered a reasonable representation.
200-BC-1	216-B-53A	1965	5.49E-01	145	This site received ~550,000 L of 300 Area Laboratory waste mixed with wastes released from PRTR. 222-S Laboratory waste and PL1 wastes are selected as the most appropriate representation of this waste disposal. The contributing volumes can be found in ARH-231 and RHO-CD-673. Although annual values have been recorded, there is no breakout between the two wastes. Their respective contributions are estimated using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Because of the significant differences in composition, the component volumes are given a 10% variability.
200-BC-1	216-B-53B	1962-1963	2.01E-02	5	This site received ~20,000 L of 300 Area Laboratory waste. 222-S Laboratory waste and PL1 wastes are selected as the most appropriate representation of this waste disposal. The contributing volumes can be found in ARH-231 and RHO-CD-673. No annual values are recorded, and there is no breakout between the two wastes. The qualitative description indicates that the more radiologically active waste was disposed later in the process history. The proportions for the waste volumes are estimated using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Because of the significant differences in composition, the derived component volumes are given a 10% variability.
200-BC-1	216-B-54	1963-1965	9.99E-01	264	This site received 1 mL of 300 Area Laboratory waste. 222-S Laboratory waste and PL1 wastes are selected as the most appropriate representation of this waste disposal. The contributing volumes can be found in ARH-231; ARH-CD-743, 4Q; and RHO-CD-673. Annual values are recorded, but there is no breakout between the two wastes. In this case, their respective contributions are estimated initially assuming linearization of the total volume over the disposal timeframe. The qualitative description indicates that the more radiologically active waste was disposed later in the process history; thus, the PL1 contribution was placed in the final year of operation. The proportions for the waste volumes are estimated using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Because of the significant differences in composition, the derived component volumes are given a 10% variability.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-B-55	1967-1985; 1988-1990	1.20E+03	317,041	SGW-60540 is to be checked for background information. This site received ~1,200 mL of B Plant cooling water during its operating history. The contributing volumes can be found in the following documents: ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141-1; WHC-EP-0141-2; and WHC-EP-0527. These volumes are considered to have low (10%) uncertainties.
200-DV-1	216-B-57	1968-1973	8.43E+01	22,272	This site received ~84 mL of ITS evaporator condensate and BY saltcake. The vast majority of the waste disposed to this site is evaporator condensate; however, the site inventories for various analytes suggest a small amount of BY saltcake carryover. The contributing volumes can be found in the following documents: ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; and ARH-2806, 4Q; and these volumes are considered to have low (10%) uncertainties. The carryover contribution is represented by an asymmetric triangular distribution with a maximum of 500 L.
200-BC-1	216-B-58	1965-1967	4.17E-01	110	This site received 417,000 L of 300 Area Laboratory waste. 222-S Laboratory waste and PL1 wastes were selected as the most appropriate representation of this waste disposal. The contributing volumes can be found in ARH-CD-743, 4Q. Annual values have been recorded, and there is a breakout between the two wastes. The qualitative description indicates that the more radiologically active waste was disposed earlier in the process history; thus, the PL1 contribution was placed in the first year. The uncertainties for these volumes are considered low (10%).
200-EA-1	216-B-59	1968	4.77E-01	126	SGW-60540 is to be checked for background information. This site received 477,000 L of B Plant cooling water. The volume is documented in ARH-1159. The uncertainty for this volume is considered low (10%).
200-EA-1	216-B-6	1945-1949	6.00E+00	1,585	SGW-60540 is to be checked for background information. This site received 6 mL of bismuth phosphate-based decontamination waste. A total value is recorded, but there are no annual values presented in WIDS (DOE-RL 2002). In this case, the respective annual contributions are estimated assuming linearization of the total volume over the disposal timeframe. Because of the indefinite nature of the volume description, this site is given a 25% variability.
200-CB-1	216-B-60	1968	1.89E-02	5	This site received 18,900 L of decontamination waste. This value is documented in ARH-486 and ARH-CD-743, 4Q. The uncertainty associated with this value is considered low (10%). The volume percent solids contribution is represented by an asymmetric triangular distribution with a maximum of 0.1%.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-B-62	1973-1986	2.80E+02	73,976	SGW-60540 is to be checked for background information. This site received ~280 mL of B Plant cooling water together with some minor losses of B Plant high-level waste (e.g., AR waste). The contributing volumes can be found in the following documents: ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P. The uncertainties associated with these volumes are considered low (10%). The volume associated with the loss of AR waste is represented by an asymmetric triangular distribution with a maximum of 100,000 L. This estimate is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis.
200-EA-1	216-B-63	1970-1992	7.98E+03	2,108,322	SGW-60540 is to be checked for background information. This site received slightly less than 8,000 mL of B Plant process cooling water, chemical sewer, ITS condensate, and a small amount of concentrated UNH condensate. The contributing volumes can be found in the following documents: ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q;; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; WHC-EP-0527-1; and WHC-EP-0527-2. The uncertainties associated with these volumes are considered low (10%). The volume associated with the UNH waste is represented by an asymmetric triangular distribution with a maximum of 200,000 L for each of the 3 years it is assumed to have been lost. This UNH volume estimate is derived using the site inventory and waste concentration values for uranium in the UNH stream as a basis.
200-DV-1	216-B-7A &B	1946-1954; 1966-1967	4.46E+01	11,783	This site received 44.6 mL of a variety of wastes over its operating history. Initially it received ~43.5 mL of 224 and 5-6 waste disposal from 1946-1954. Annual values are recorded, but there is no breakout provided between the two wastes in ARH-CD-743, 4Q as part of the early process history. However, LA-UR-97-0311 , HW-28121, HW-33591, and HW-38562 have useful information in establishing discriminating characteristics between the two waste volumes. The decontamination waste and strontium recovery waste disposals occurred in 1966 and 1967, and they make up the remainder of the volume. Because of the degree of interpretation necessary to assign waste types and volumes, contributing volumes are given 25% variability.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-DV-1	216-B-8	1948-1953	3.53E+01	9,326	This site received ~35.3 mL of 224 and 5-6 waste disposal from 1946-1953. Annual values are recorded, but there is no breakout provided between the two wastes in ARH-CD-743, 4Q as part of the early process history. However, LA-UR-97-0311 , HW-28121, HW-33591, and HW-38562 have useful information in establishing discriminating characteristics between the two waste volumes. Because of the degree of interpretation necessary to assign waste types and volumes, the contributing volumes are given a 25% variability.
200-DV-1	216-B-9	1948-1951	3.60E+01	9,511	This site received 36 mL of 5-6 waste. Annual values are recorded in ARH-CD-743, 4Q. The volume uncertainties are considered low (10%).
200-EA-1	216-BY-201	1954-1955	4.16E-02	11	SGW-60540 is to be checked for background information. This site received 41,600 L of ferrocyanide waste. The uncertainty for this site is considered high (50%) because the source presented in WIDS (DOE-RL 2002) is a flush tank and a potential dilution with water is assumed to be possible.
200-EA-1	216-C-1	1952-1957	2.34E+01	6,182	SGW-60540 is to be checked for background information. This site principally received REDOX and PUREX cold start waste. Other minor contributions of Hot Semiworks and decontamination waste were also received. The contributions can be found in the following documents: ARH-CD-743, 4Q; HW-38562; HW-44784; HW-48518; HW-53336 Total volume = 32.4 mL; and ARH-CD-743, 4Q Total volume = 23.4 mL. Because of inconsistencies in the various source materials regarding total volume, the uncertainties for the contributing volumes is considered high (50%).
200-EA-1	216-C-10	1964-1967	8.97E-01	237	SGW-60540 is to be checked for background information. This site received approximately 900,000 L of B Plant stack drainage and a small amount of Hot Semiworks waste. The contributions can be found in the following documents: BNWC-91; ISO-98; ISO-698; and ARH-486. The discharges are considered to be principally stack drainage with the Hot Semiworks volume estimate derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for the stack drainage volumes are considered low (10%), and the uncertainties for the Hot Semiworks waste volumes are considered high (50%).
200-EA-1	216-C-2	1953-1988	3.15E+00	832	SGW-60540 is to be checked for background information. This site received 3.15 mL of B Plant stack drainage over its operating history according to WIDS (DOE-RL 2002). A loss of 10 L/day is assumed for a discharge rate. The uncertainty associated with this volume estimate is high (50%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-C-3	1953-1954	5.00E+00	1,321	SGW-60540 is to be checked for background information. This site received 5 mL of dilute and concentrated UNH process condensate and a small amount of Hot Semiworks waste. The annual volumes are recorded in ARH-CD-743, 4Q. The discharges are considered to be principally dilute UNH. The concentrated UNH and Hot Semiworks volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for the waste volumes are considered high (50%).
200-EA-1	216-C-4	1955-1957; 1962-1964	1.70E-01	45	SGW-60540 is to be checked for background information. This site received 170,000 L of B plant organic waste and stack drainage. Annual values are recorded but there is no breakout provided between the two wastes. The contributions can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-76638; HW-80877; BNWC-91; and ARH-CD-743, 4Q. The discharges are considered to be principally stack drainage with the high-level B Plant waste volume derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Furthermore, there are inconsistencies in the various source materials regarding total volume over time; therefore, the uncertainties for the contributing for the stack drainage volume is considered high (50%), and the B Plant high-level waste volume is represented by an asymmetric triangular distribution with an annual maximum of 60 L.
200-EA-1	216-C-5	1955	3.89E-02	10	SGW-60540 is to be checked for background information. This site received 38,900 L of PUREX cold start waste. This assignment is based on the information in HW-38562. The uncertainty associated with this volume is considered low (10%).
200-EA-1	216-C-6	1955-1957; 1962-1964	5.31E-01	140	SGW-60540 is to be checked for background information. This site received slightly more than 530,000 L of REDOX D-2 process condensate and misc. PUREX drainage that is represented by B Plant organic waste. The contributing values can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-76638 Total volume = 0.105 mL; ARH-CD-743, 4Q Total volume = 0.055 mL; HW-80877 Total volume = 0.56 mL; ARH-CD-743, 4Q Total volume = 0.348 mL; BNWC-91 Total volume = 0.15 mL; and ARH-CD-743, 4Q Total volume = 0.12 mL. As can be seen, there are some irregularities between the source documents and the reconciled values. In this case, the source document values were accepted as reliable. The early D-2 waste volumes are considered to have a moderate (25%) uncertainty. Where the D-2 and high-level waste are disposed in the same timeframe, the D-2 was assigned a low (10%) uncertainty, but the PUREX drainage waste volume is represented by an asymmetric triangular distribution with an annual maximum of 270 L.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-EA-1	216-C-7	1961-1983	5.99E-02	16	SGW-60540 is to be checked for background information. This site received ~60,000 L of waste from the Critical Mass Laboratory. This waste is assumed to be 209-E reflector water, because of its low activity. The contributing volumes can be found in the following documents: ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; and RHO-HS-SR-83-3 4QLIQ-P. The uncertainty associated with these volumes is considered low (10%).
WMA C	216-C-8	1962-1965	1.00E-02	3	This site received 10,000 L of miscellaneous Hot Semiworks drainage over a number of years. B Plant stack drainage is considered to be the best waste stream to represent this situation. A total volume is recorded; however, there are no annual values. The volume presented in WIDS (DOE-RL 2002) is linearized over the operating history to provide annual volumes. Because of the indefinite nature of the volume description, this site is given a 50% variability.
200-SW-2	216-C-9	1953-1985	1.04E+03	274,769	This site received ~1,040 mL of B Plant chemical sewer, B Plant stack drainage, B Plant cooling water, and 209-E reflector water. There are annual volumes; however, no contributing volumes are broken out. These values can be found in the following documents: ARH-CD-743, 4Q; DOE/RL-92-18; ARH-486; ARH-1159; and ARH-1608. The current assumption is that the wastes are divided: 90% cooling water, 5%, stack drainage, and 5% chemical sewer in the early operating history. This disposition assumes the 209-E volume discharge constant (100,000 L) from 1960-1985; and it assumes the Semiworks facility volume is 5% of the 1969 volume after shutdown. Because of the indefinite nature of the volume description, these site volumes are given a 50% variability.
200-CW-3	216-N-1	1944-1952	9.47E+02	250,198	This site received 947 mL of low-level radioactive cooling water. The most appropriate description for this waste stream is 209-E Reflector water. WIDS (DOE-RL 2002) and ARH-231 have total waste volume amounts; however, no annual volumes are presented. The disposal volumes were assumed to be similar to 216-N-4. The uncertainties associated with these volumes are considered high (50%) because of the ambiguity regarding the disposals.
200-CW-3	216-N-2	1947	7.57E+00	2,000	This site received 7.57 mL of bismuth phosphate process cooling water and low-level radioactive cooling water represented by 209-E Reflector water. There is a disposal volume presented; however. no contributing volumes are broken out. The assumption for this site was that the majority of the volume is uncontaminated. This value can be found in the following document: ARH-CD-743, 4Q. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with the reflector water is considered low (10%), and the uncertainty associated with the cooling water is considered moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CW-3	216-N-3	1952	7.57E+00	2,000	This site received 7.57 mL of bismuth phosphate process cooling water and low-level radioactive cooling water represented by 209-E Reflector water. There is a disposal volume presented; however, no contributing volumes are broken out. The assumption for this site is that the majority of the volume is uncontaminated. These values can be found in the following documents: ARH-CD-743, 4Q and RHO-CD-673. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with the reflector water is considered low (10%), and the uncertainty associated with the cooling water is considered moderate (25%).
200-CW-3	216-N-4	1944-1952	9.47E+02	250,198	This site received 947 mL of low-level radioactive cooling water. The most appropriate description for this waste stream is 209-E Reflector water. ARH-CD-743, 4Q has total waste volume amounts; however, no contributing volumes are presented. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with these volumes is considered high (50%).
200-CW-3	216-N-5	1952	7.57E+00	2,000	This site received 7.57 mL of bismuth phosphate process cooling water and low-level radioactive cooling water represented by 209-E Reflector water. There is a disposal volume presented; however, no contributing volumes are broken out. The assumption for this site is that the majority of the volume was uncontaminated. This value can be found in the following document: ARH-CD-743, 4Q. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with the reflector water is considered high (50%).
200-CW-3	216-N-6	1944-1952	9.47E+02	250,198	This site received 947 mL of low-level radioactive cooling water. The most appropriate description for this waste stream is 209-E Reflector water. ARH-CD-743, 4Q has total waste volume amounts; however, no contributing volumes are presented. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with these volumes is considered high (50%).
200-CW-3	216-N-7	1952	7.57E+00	2,000	This site received 7.57 mL of bismuth phosphate process cooling water and low-level radioactive cooling water represented by 209-E Reflector water. There is a disposal volume presented; however, no contributing volumes are broken out. The assumption for this site is that the majority of the volume was uncontaminated. This value can be found in the following document: ARH-CD-743, 4Q. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with the reflector water is considered high (50%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-S-1&2	1952-1956	1.60E+02	42,272	This site received 160 mL of REDOX D-1 cell drainage and D-2 process condensate. There are disposal volumes presented; however, no contributing volumes are broken out. These values can be found in the following documents: HW-33591; HW-38562; HW-44784; and ARH-CD-743, 4Q. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with these volumes is considered moderate (25%).
200-OA-1	216-S-10P	1951-1991	6.73E+03	1,778,071	This site received approximately 6,730 mL of REDOX chemical sewer, process cooling water, and misc. drainage over its operating lifetime. 216-S-10P, 216-S-10D, and 216-S-11 are consolidated and reported as one site. 216-S-10P began receiving waste from 202-S in August 1951; however, volume records do not begin reporting until 1954; thus, an average monthly volume (3.74 mL/mo.) is calculated, partitioned, and applied to that prior timeframe. Available annual reporting volumes can be found in the following documents: ARH-231; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; and WHC-EP-0527-1. Estimated contributing percentages for the various wastes are derived from these sources and broadly applied. Because of these characteristics, all volume uncertainties are considered moderate (25%).
200-WA-1	216-S-12	1954	6.81E-02	18	This site received 68,100 L of REDOX stack drainage. However, the site inventories for various analytes suggest a small amount of REDOX D-1 waste is mixed in with the drainage. The reported volume can be found in the following documents: ARH-CD-743, 4Q and RHO-CD-673. The stack drainage volume is considered to have a low (10%) uncertainty. In this case, the D-1 waste contribution is represented by an asymmetric triangular distribution with a maximum of 20,000 L.
200-DV-1	216-S-13	1951-1966	5.00E+00	1,321	This site received ~5 mL of mixed REDOX waste. Estimates from 1951-1955 assume a 0.0587 mL/mo. rate, HW-44784; however, the reconciled values from ARH-CD-743, 4Q are slightly different. The total annual reconciled values are used and a 90%/10% split between the contributing REDOX organic waste or REDOX cold start waste and dilute UNH condensate is assumed. Reported volumes can be found in the following documents: HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; and ISO-698. The uncertainty associated with these volumes is considered moderate (25%).
200-WA-1	216-S-14	1952	7.60E-02	20	WIDS (DOE-RL 2002) indicates that the site received 76,000 L of REDOX cold start waste. ARH-231 presents a disposal volume of 68,100 L. Despite the slight discrepancy in volume, a low (10%) uncertainty is assigned to this waste site.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CW-1	216-S-16P	1957-1972	4.07E+04	10,752,972	WIDS (DOE-RL 2002) indicates that nearly 41,000 mL of REDOX cooling water and process condensate was disposed at this site over its operating history. There are annual volume contributions presented in ARH-CD-743, 4Q. There are no reliable contributing volumes presented in other historical documentation. The estimated contribution of REDOX process condensate is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The volume estimate for the cooling water is considered to have a low (10%) uncertainty, and the volume estimate for the process condensate is considered to have a moderate (25%) uncertainty.
200-CW-1	216-S-17	1951-1954	6.44E+03	1,701,453	This site received ~6,440 mL of REDOX cooling water, REDOX UNH process condensate, Powerhouse water, and intermittent releases of REDOX high-level waste from piping failures. The annual volumes can be found in the following documents: ARH-CD-743, 4Q; RHO-CD-673; and HW-38562. The wastes discharged here are assumed to be principally cooling water, with the contributions of UNH process condensate estimated using the site inventory and waste concentration values for uranium and an assumption of 90%/10% dilute/concentrated UNH as a basis. The loss of REDOX high-level waste is estimated using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis as well. The uncertainty associated with the cooling water volumes are considered low (10%), with the UNH process condensate and Powerhouse water moderate (25%). The REDOX high-level waste volume is represented by an asymmetric triangular distribution with an annual maximum of 1,000 L.
200-OA-1	216-S-19	1952-1984	1.30E+03	343,461	This site received 1,300 mL of REDOX laboratory waste over its operating history. The contributing volumes can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; Summary = 34.5 mL, monthly = 29.6 mL assumed summary reconciled and complete; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P. The uncertainties associated with these volumes are considered low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-S-20	1952-1969; 1972-1973	1.35E+02	35,667	This site received 135 mL of REDOX and 300 Area laboratory waste. Some of the higher activity 300 Area waste is represented using PL1 waste as a proxy. The contributing waste volumes can be found in the following documents: HW-33591; HW-38562 --included incremental addition of PL1 and assumed 20:1 dilution of PL1; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375 = 7.3 mL; ARH-CD-743, 4Q; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-71971--assumed same volume discharged in 2nd 6 months as in 1st 6 months; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2757 Pt3; and ARH-2806, 4Q. The uncertainties associated with most of these volumes are considered low (10%), except for the PL1 contributions representing 300 Area wastes which are considered high (50%), and the volume associated with 1961 where the 6 mo. volume was doubled to represent the entire year. That waste volume uncertainty was considered moderate (25%).
200-DV-1	216-S-21	1954-1969	8.71E+01	23,012	This site received 87 mL of REDOX tank farm condensate; however, site inventories for various analytes suggest a small amount of REDOX high-level waste is mixed with condensate. Contributing waste volumes are in the following documents: HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; and ARH-1608. Uncertainty associated with these volumes is considered to be low (10%). Certain minor discrepancies are observed between the reconciled values in ARH-CD-743, 4Q and individual source documents, but deviations are within the uncertainty assignment.
200-WA-1	216-S-22	1957-1959	9.83E-02	26	WIDS (DOE-RL 2002) indicates this site received 98,300 L of acidic REDOX process condensate. This waste stream is considered to be appropriately represented by spent nitric acid. The annual values are presented in ARH-CD-743, 4Q. The uncertainty associated with these values is considered moderate (25%).
200-WA-1	216-S-23	1969-1972	3.41E+01	9,009	This site received 34 mL of REDOX process cooling water. The contributing waste volumes can be found in the following documents: ARH-2015 Pt3; ARH-2353 Pt3; and ARH-2757 Pt3. The uncertainties associated with these volumes are considered low (10%).
200-WA-1	216-S-25	1973-1980; 1985	2.88E+02	76,090	WIDS (DOE-RL 2002) indicates that this site received 288 mL of 242-S Evaporator condensate, laboratory waste water; and pump and treat groundwater. The contributing waste volumes are in the following documents: ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; and RHO-HS-SR-85-3 4Q LIQ P. The pump and treat groundwater contribution from 216-U-1%2 is represented by dilute UNH waste. The uncertainties associated with these volumes are considered low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-OA-1	216-S-26	1984-1995	2.19E+02	57,860	This site received 219 mL of 222-S Laboratory waste. A small amount of Z Complex cooling water was also disposed at this site. The contributing volumes are in the following documents: RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; WHC-EP-0527-1; WHC-EP-0527-2; WHC-EP-0527-3; WHC-EP-0527-4; and WHC-EP-0527-5. Uncertainties associated with laboratory waste discharges are considered low (10%), and Z Complex cooling water discharge uncertainties are considered moderate (25%).
200-WA-1	216-S-3	1953-1956	4.20E+00	1,110	This site received 4.2 mL of REDOX tank farm condensate and concentrated UNH process condensate. The vast majority of the waste disposed to this site is REDOX tank farm condensate; however, the site inventories for various analytes suggest the presence of a small amount of REDOX saltcake carryover and some small amount of REDOX process condensate. The contributing volumes can be found in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; and ARH-CD-743, 4Q. The tank farm condensate volume uncertainties are considered to be low (10%). The UNH process condensate volumes are derived using the site inventory and waste concentration values for uranium as a basis and are considered to have moderate (25%) uncertainties. The saltcake carryover contribution is represented by an asymmetric triangular distribution with a maximum of 100 L.
200-WA-1	216-S-4	1953-1956	9.99E-01	264	According to WIDS (DOE-RL 2002), this site received ~1 mL of REDOX tank farm condensate. There is a total disposed volume; however, no annual contributions are presented. The annual volumes are estimated by linearizing the total volume over the operating history. The uncertainty associated with this volume estimate is considered moderate (25%).
200-WA-1	216-S-5	1954-1957	4.08E+03	1,077,939	This site received >4,080 mL of REDOX cooling water with a small amount of UNH process condensate and a trace of high-level REDOX waste. Contributing volumes are in the following documents: HW-38562; HW-44784; HW-48518; HW-53336; and ARH-CD-743, 4Q. The cooling water volume uncertainties are considered to be low (10%). The UNH process condensate volumes are derived using the site inventory and waste concentration values for uranium as a basis and are considered to have moderate (25%) uncertainties. High-level REDOX waste contribution is represented by an asymmetric triangular distribution with a maximum volume of 2,000 L.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-S-6	1954-1972	4.44E+03	1,173,052	This site received over 4,440 mL of REDOX cooling water with a small amount of UNH process condensate and a trace of REDOX D-1 waste. The contributing volumes can be found in the following documents: HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; and ARH-2757 Pt3. The cooling water volume uncertainties are considered to be low (10%). The UNH process condensate volumes are derived using the site inventory and waste concentration values for uranium as a basis and are considered to have moderate (25%) uncertainties. The REDOX D-1 waste contribution is represented by an asymmetric triangular distribution with a maximum volume of 10,000 L.
200-WA-1	216-S-7	1956-1965	3.90E+02	103,038	This site received 390 mL of REDOX D-1 cell drainage and D-2 process condensate. There are yearly disposal volumes presented; however, no contributing volumes are broken out. These values can be found in the following documents: HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-76638; HW-80877; BNWC-91; ISO-98; and ARH-CD-743, 4Q. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties associated with these volumes are considered moderate (25%).
200-WA-1	216-S-8	1952-1953	1.00E+01	2,642	This site received 10 mL of REDOX cold start waste. The site volume can be found in ARH-CD-743, 4Q; however, it appears that the annual volumes are simply divided equally between the years of operating history. The uncertainty associated with this volume is considered moderate (25%).
200-DV-1	216-S-9	1965-1969	4.96E+01	13,104	This site received 49.5 mL of REDOX D-1 cell drainage and D-2 process condensate. Yearly disposal volumes are presented; however, no contributing volumes are broken out. These values are in the following documents: ISO-98; ISO-698; ARH-486; ARH-1159; and ARH-1608. The split between contributing waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties associated with these volumes are considered moderate (25%).
200-OA-1	216-T-1	1945-1956; 1964-1995	2.75E+02	72,655	WIDS (DOE-RL 2002) indicates that this site received 178 mL of bismuth phosphate decontamination and B Plant decontamination stack drainage through 1964. These volumes can be found in ARH-CD-743, 4Q and are considered to have a moderate (25%) uncertainty. Other information indicates that 216-T-1 received nearly 100 mL of additional waste, principally PUREX chemical sewer and B Plant stack drainage from 1964-1995. These values are derived from data in RHO-CD-673 and DOE/RL-91-61 and are considered to have moderate (25%, where there is only one contributing waste type) to high (50%, where a 99%/1% split between the contributing waste types is assumed) uncertainties.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-T-12	1954	5.01E+00	1,324	This site received 5 mL of bismuth phosphate misc. drainage. The volume can be found in the following reference: ARH-CD-743, 4Q. This waste is represented by dilute and concentrated UNH with a small amount of 1C. The principal waste volume is considered to be dilute UNH because of the low inventories recorded. The split between contributing UNH waste volumes is derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with these volumes is considered moderate (25%). A residual trace of 1C waste is included and represented using a high (50%) uncertainty.
200-DV-1	216-T-14	1954	1.01E+00	267	This site received 1 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-15	1954	1.04E+00	275	
200-DV-1	216-T-16	1954	1.02E+00	269	
200-DV-1	216-T-17	1954	7.85E-01	207	This site received 785,000 L of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-18	1953	9.69E-01	256	This site received ~1 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-33591. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-19	1951-1956; 1965-1976	4.55E+02	120,211	This site received 455 mL of 5-6 waste, 2C waste, and 242-T Evaporator condensate. The contributing volumes and waste types can be found in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; ISO-698; ARH-CD-743, 4Q transcription error; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; and ARH-CD-743, 4Q. The volume uncertainty for the 5-6 and 2C waste is considered to be moderate (25%), and the uncertainty for the evaporator condensate is considered to be low (10%).
200-WA-1	216-T-2	1951-1956	6.01E+00	1,588	This site received 6 mL of decontamination waste. The site volumes can be found in ARH-2806, 4Q and RHO-CD-673; however, there are no annual volumes presented. Annual volumes are estimated as linearized values over the operating history. The uncertainty associated with this volume is considered moderate (25%).
200-WA-1	216-T-20	1952	1.89E-02	5	This site received 18,900 L of waste, principally spent nitric acid, with a slight amount of 1C evaporator waste. This representation is considered appropriate after review of the available documentation: DOE/RL-91-61; and ARH-CD-743, 4Q. The spent nitric acid volume is considered to have a low (10%) uncertainty and the 1C evaporator waste contribution is represented by an asymmetric triangular distribution with a maximum of 100 L.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-DV-1	216-T-21	1954	4.63E-01	122	This site received 463,000 L of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-22	1954	1.54E+00	407	This site received 1.54 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-23	1954	1.49E+00	394	This site received 1.486 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-24	1954	1.54E+00	407	This site received 1.54 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-25	1954	2.99E+00	790	This site received 2.987 mL of 1C waste. The volume and waste stream can be found in the following reference: HW-38562. The uncertainty associated with this volume is considered low (10%).
200-DV-1	216-T-26	1955-1956	1.11E+01	2,933	This site received 11 mL of ferrocyanide waste. The volumes and waste stream can be found in the following references: HW-44784; HW-48518; and GE 1958. The uncertainty associated with this volume is considered low (10%).
200-WA-1	216-T-27	1965	7.19E+00	1,900	WIDS (DOE-RL 2002) documents that this site received ~7 mL of decontamination waste and 300 Area laboratory waste. The 300 Area laboratory waste is represented as 222-S Laboratory waste with a small contribution of PL1. There are discrepancies in the source documents regarding the volume disposed to this site; however, they appear to be typographical errors involving the decimal point. The volume data can be found in the following documents: ISO-98 = 41.8 mL--apparent transcription error; ARH-CD-743, 4Q. Because of these discrepancies, the uncertainties associated with these volumes are moderate (25%) to high (50%; estimating the PL1 contribution).
200-WA-1	216-T-28	1960-1966	4.23E+01	11,176	This site received 42 mL of decontamination waste and 300 Area laboratory waste. The 300 Area laboratory waste is represented as 222-S Laboratory waste with a small contribution of PL1. The volume data can be found in the following documents: HW-69071; HW-69072; ARH-CD-743, 4Q; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; and ARH-CD-743, 4Q. The uncertainties associated with most of these volumes are low (10%), except for the uncertainty associated with the estimated PL1 contribution to the 300 Area waste which is considered high (50%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-T-29	1949-1964	7.40E-02	20	WIDS (DOE-RL 2002) indicates that this site received 74,000 L of bismuth phosphate stack drainage. This waste volume is represented with both bismuth phosphate stack drainage and B Plant decontamination stack drainage. There are no annual volumes associated with the disposal to this site; therefore, the volume is linearized over the operating history of the site. The uncertainty associated with this volume estimate is considered to be moderate (25%).
200-DV-1	216-T-3	1945-1946	1.13E+01	2,985	This site received 11.3 mL of 224 and 5-6 waste disposal from 1945-1946. Annual values are recorded, but there is no breakout provided between the two wastes in ARH-CD-743, 4Q as part of the early process history. However, LA-UR-97-0311 has useful information in establishing discriminating characteristics between the two waste volumes. Because of the degree of interpretation necessary to assign waste types and volumes and the ambiguity in the documentation regarding the location of the inventory between the underground storage tanks and the disposal site, the contributing volumes are given a 25% variability.
200-DV-1	216-T-32	1946-1952	2.90E+01	7,662	This site received 29 mL of 224 waste from 1946-1952. Annual values are recorded in ARH-CD-743, 4Q. These volumes are considered to have a moderate (25%) uncertainty because of the ambiguity regarding the location of the documented inventory between the underground waste tanks and disposal site.
200-WA-1	216-T-33	1963	1.90E+00	502	This site received 1.9 mL of decontamination waste and process condensate. This discharge is represented by B Plant decontamination stack drainage, decontamination waste, and UNH process condensate. The total volume can be found in ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainty associated with these volumes is considered high (50%).
200-WA-1	216-T-34	1966-1967	1.73E+01	4,571	This site received 17.3 mL of decontamination waste and 222-S Laboratory waste. There are discrepancies in the initial source document regarding the volume disposed to this site; however, they appear to be corrected in the subsequent document. The volume data can be found in the following documents: ISO-698 and ARH-486. The uncertainty associated with these volumes is considered low (10%).
200-WA-1	216-T-35	1967-1968	5.73E+00	1,514	This site received 5.7 mL of 222-S Laboratory waste. The volume data can be found in the following documents: ARH-486 and ARH-1159. The uncertainty associated with these volumes is considered low (10%).
200-WA-1	216-T-36	1967-1969	5.09E-01	134	This site received 509,000 L of decontamination waste. The volume data can be found in the following documents: ARH-486; ARH-1159; and ARH-1608. The uncertainty associated with these volumes is considered low (10%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-SW-2	216-T-4A	1944-1957; 1960-1995	4.28E+04	11,307,794	WIDS (DOE-RL 2002) indicates that this site received nearly 43,000 mL of 242-T Evaporator condensate, bismuth phosphate chemical sewer, and decontamination waste. Waste streams are selected in context with the activity occurring at T Plant--bismuth phosphate chemical sewer is selected for the early part of this site's operating history (1944-1956); in 1956 and 1957, a small amount of UNH process condensate is used to represent the wastes being discharged then; from 1960-1964, decontamination waste and stack drainage is disposed at this site. In 1965-1975, 242-T Evaporator condensate is discharged here as well as the decontamination waste and stack drainage. The total volumes disposed to this site from 1944-1976 can be found in ARH-CD-743, 4Q. After 1976, the assumed discharge rate cited in DOE/RL-91-61 is considered constant over the remaining operating history. Because of the ambiguities associated with these values, the uncertainties for these volumes are considered moderate (25%) to high (50%).
200-DV-1	216-T-5	1955	3.15E+00	832	This site received 3.15 mL of 2C waste. There is a discrepancy between two sources regarding the volume: HW-38562 indicates that 2.65 mL was discharged to this site. However, LA-UR-97-0311 indicates that 3.15 were discharged from the tank farms to this site. Because of the disagreement in the documentation regarding the volume discharged from the underground storage tanks to the disposal site, the volume is given a 25% variability.
200-DV-1	216-T-6	1946-1947	4.50E+01	11,889	This site received 45 mL of 224 and 5-6 waste disposal from 1946-1947. Annual values are recorded, but there is no breakout provided between the two wastes in ARH-CD-743, 4Q as part of the early process history. However, LA-UR-97-0311 and WHC-MR-0132 both have useful information in establishing discriminating characteristics between the two waste volumes. Because of the degree of interpretation necessary to assign waste types and volumes and the ambiguity in the documentation regarding the location of the inventory between the underground storage tanks and the disposal site, the contributing volumes are given a 25% variability.
200-DV-1	216-T-7	1947-1955	1.07E+02	28,269	This site received ~107 mL of 2C, 224 and 5-6 waste from 1947-1955. Annual values are recorded, but there is no breakout provided between the various wastes in ARH-CD-743, 4Q as part of the early process history. However, LA-UR-97-0311 and WHC-MR-0132 both have useful information in establishing discriminating characteristics between the contributing waste volumes. Because of the high degree of interpretation necessary to assign waste types and volumes, the contributing volumes are given a 50% variability.
200-WA-1	216-T-8	1950-1951	5.00E-01	132	This site received 500,000 L of decontamination waste and decontamination stack drainage. The annual volumes can be found in ARH-CD-743, 4Q. The discharges are assumed to be 90% the more dilute stack drainage and 10% the decontamination waste. Because of the selected proportions for the wastes, these values are considered to have low (10%) uncertainties.

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-U-1%2	1951-1956; 1958-1960; 1966-1967	1.59E+01	4,201	This site received ~16 mL of TBP organic waste and U Plant condensates. The annual volumes can be found in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; HW-63646; HW-64375; HW-69701; HW-69072; ISO-698; ARH-486; and ARH-CD-743, 4Q. There are discrepancies in the source documents regarding the volume disposed to this site; however, they appear to be corrected/reconciled in subsequent documents. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. Because of the degree of interpretation necessary to assign waste types and volumes, the contributing volumes are given a 25% variability.
200-CW-1	216-U-10	1944-1995	1.60E+05	42,272,127	This site received ~160,000 mL of PUREX, REDOX, and Z Plant process condensates, cooling water, laundry waste, Powerhouse water, and chemical sewer. The annual contributing volumes can be found in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-CD-743, 4Q; RHO-CD-34 4Q; RHO-CD-78-34 4Q; RHO-CD-79-34 4Q; RHO-CD-80-34 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527-2; WHC-EP-0527-3; and WHC-EP-0527-4. The uncertainties for most of these contributions are considered moderate (25%) because of potential volume allocation issues related to nomenclature (e.g., consolidating the volumes associated with several differently labeled waste streams under one generic label).
200-WA-1	216-U-12	1960-1971; 1981-1988	1.49E+02	39,366	This site received approximately 150 mL of U Plant process condensates; additionally there was a small documented excursion of TH1 waste to this site. The wastes used to represent the discharges are dilute and concentrated UNH process condensates, PUREX stack drainage, and TH1. The contributing volumes can be found in the following documents: HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-CD-743, 4Q; RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; and WHC-EP-0141-1. There are a few discrepancies in the source documents regarding the volume disposed to this site; however, they appear to be corrected/reconciled in subsequent documents. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be mostly low (10%).
200-WA-1	216-U-13	1952-1956	1.14E-02	3	WIDS (DOE-RL 2002) indicates that this site received ~11,000 L of bismuth phosphate decontamination waste. The annual volumes associated with the disposal to this site are documented in ARH-CD-743, 4Q. The uncertainty associated with this volume estimate is considered to be moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-U-14	1944-1995	4.88E+03	1,289,300	This site was often consolidated with 216-U-10 for surveillance reporting; however, for modeling purposes, it was considered a separate entity. An assumption regarding the ratio of the two disposal site areas is used to estimate the total and individual contributing waste volumes for 216-U-14. The calculated ratio for this site is 0.0371*discharge volume for U-10, and the total volume estimated for this site was 4,884 mL. The waste streams discharged here include REDOX and PUREX cooling water, process condensates and misc. drainage; laundry wastewater. There are other waste streams that did not travel to 216-U-10 via 216-U-14, and these volumes are not included in the volume estimate. Because of the number of assumptions associated with this volume estimate, the uncertainty assigned to these values is high (50%).
200-WA-1	216-U-15	1957	6.81E-02	18	WIDS (DOE-RL 2002) estimates that 68,100 L of TBP organic waste and decontamination waste was disposed at this site. The volume associated with the disposal site is documented in ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be moderate (25%).
200-WA-1	216-U-16	1984-1985	4.09E+02	108,058	This site received 409 mL of U Plant chemical sewer and process condensate. The annual volumes associated with the disposal to this site are documented in RHO-HS-SR-84-3 4Q LIQ P and RHO-HS-SR-85-3 4Q LIQ P. The uncertainties associated with these volume estimates are considered to be low (10%) to moderate (25%).
200-WA-1	216-U-17	1988-1989; 1992-1994	5.93E+00	1,567	This site received ~6 mL of U Plant process condensates. Because of the low levels of inventory associated with this site, dilute UNH process condensate is considered to be the most appropriate representation. The annual volumes associated with the disposal to this site are documented in WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527-2; WHC-EP-0527-3; and WHC-EP-0527-4. The uncertainty associated with these volume estimates is considered to be low (10%)
200-WA-1	216-U-3	1954-1955	7.91E-01	209	This site received 79,100 L of REDOX tank farm condensate and process condensate. The majority of the waste is assumed to be tank farm condensate, with a small amount of UNH waste. The annual volumes disposed to the site can be found in the following documents: HW-33591; HW-38562; HW-44784; and ARH-CD-743, 4Q. The contributing waste volumes are derived using the site inventory and waste concentration values for uranium as a basis. The uncertainties for these volumes are considered to be moderate (25%).
200-WA-1	216-U-4	1947-1955	3.00E-01	79	WIDS (DOE-RL 2002) estimates that 300,000 L of decontamination waste was disposed here. Additionally, because of the waste source (222-U Laboratory sink), a modest amount of 224 waste is assumed present and is estimated using the site inventory and waste concentration values for Pu-239 as a basis. There are no annual volumes associated with this site; thus, they are estimated assuming the total volume (net the estimated 224 waste volume) was linearized over time. The uncertainties for these volumes are considered to be moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-U-4A	1955-1961; 1965-1970	5.45E-01	144	This site received 545,000 L of decontamination waste and laboratory waste. The annual volumes of waste can be found in the following documents: HW-44784; HW-53336; HW-55593; HW-57649; HW-59359 = 0.000238 mL (assume reconciled volume is correct; ARH-CD-743, 4Q) and increase uncertainty from 10% to 50%; HW-63646; HW-64375 = 0.0000873 mL--assume reconciled volume is correct (ARH-CD-743, 4Q) and increase uncertainty from 10% to 50%; HW-69071; HW-71971; HW-72956; ARH-486 = 0.031 mL (assume reconciled volume is correct; ARH-CD-743, 4Q) and increase uncertainty from 10% to 50%; ARH-1159; ARH-1608; ARH-2015 Pt3; and ARH-CD-743, 4Q. The uncertainties associated with these volumes range from low (10%) to high (50%), depending on the degree of agreement between the source documentation.
200-WA-1	216-U-4B	1960-1968	3.30E-02	9	This site received 33,000 L of laboratory waste from 222-U and Battelle. This disposal is represented using 222-S Laboratory waste. Annual volumes of waste are in the following documents: ARH-486 = 0.003 mL (assume reconciled volume is correct; ARH-CD-743 4Q) and assign 50% uncertainty; ARH-1159 = 0.00757 mL (assume reconciled volume is correct; ARH-CD-743 4Q) and assign 50% uncertainty; ARH-CD-743, 4Q. The uncertainties associated with these volumes, except where noted, are considered to be moderate (25%).
200-WA-1	216-U-5	1952	2.25E+00	594	This site received 2.25 mL of PUREX cold start waste. The disposal volume can be found in the following documents: RHO-CD-673; and ARH-CD-743, 4Q. The uncertainty associated with this value is low (10%).
200-WA-1	216-U-6	1952	2.25E+00	594	
200-WA-1	216-U-7	1952-1957	7.00E-03	2	WIDS (DOE-RL 2002) indicates that this site received 7,000 L of U Plant stack drainage. There are no annual volumes recorded for this site; thus, the total volume is linearized over the operating history to provide estimates for each year. The uncertainties associated with these values are considered moderate (25%).
200-WA-1	216-U-8	1952-1960	3.75E+02	99,075	This site received 375 mL of spent nitric acid and U Plant process condensates. The process condensates are represented using concentrated and dilute UNH waste streams and various stack drainage. The annual volumes are in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; and ARH-CD-743, 4Q. However, there are no breakouts of individual waste stream volumes. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be mostly moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-OA-1	216-W-LWC	1981-1993	9.99E+02	263,937	This site received almost 1,000 mL of Laundry waste over its operating lifetime. The annual volumes can be found in the following documents: RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; WHC-EP-0527-1; WHC-EP-0527-2; and WHC-EP-0527-3. The uncertainty associated with these volumes is considered low (10%).
200-PW-1	216-Z-1%2	1949-1952; 1966-1969	3.37E+01	8,904	Renamed from Z-1/2 to mitigate macro issues. This site received ~34 mL of plutonium and americium recoveries and Z Complex laboratory waste during its operating lifetime. The annual volumes of waste disposed to this site are in the following documents: ISO-98; ARH-486; ARH-1159; ARH-1608; and ARH-CD-743, 4Q. Contributing wastes and volumes are derived using site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered moderate (25%).
200-PW-6	216-Z-10	1945	1.00E+00	264	This site received 1 mL of plutonium recovery waste and Z Complex laboratory waste. The volume of waste disposed to this site are in the following document: ARH-CD-743, 4Q. The contributing wastes and volumes are derived using site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered mostly moderate (25%).
200-CW-5	216-Z-11	1959-1970	7.20E+03	1.9E+06	The 216-Z-11 ditch is a backfilled surface stabilized ditch that ran from the east side of the 234-5Z facility southward to the 216-U-10 Pond. The site received chemical sewer waste, Lab and cooling water from the Z Complex.
200-PW-1	216-Z-12	1959-1973	2.72E+02	71,863	This site received ~272 mL of plutonium purification, 232-Z incinerator, and Z Complex laboratory waste. The annual volumes of waste disposed to this site can be found in the following documents: HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; HW-80877; BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; and ARH-CD-743, 4Q. The contributing wastes and volumes are derived using site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered moderate (25%).
200-WA-1	216-Z-13	1949-1999	4.98E+01	13,157	There are no estimates for annual or total volume available for this site. To estimate annual and total discharge volumes, an average of 2 L loss/minute throughout the operating history of the site is assumed. This assumption results in ~1 mL of discharge per year, or ~50 mL of Z Complex stack drainage during its operating lifetime. The uncertainty associated with this estimate is considered high (50%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-Z-14	1949-2001	5.18E+01	13,686	There are no estimates for annual or total volume available for this site. To estimate annual and total discharge volumes, an average of 2 L loss/minute throughout the operating history of the site is assumed. This assumption results in ~1 mL of discharge per year, or ~52 mL of Z Complex stack drainage during its operating lifetime. The uncertainty associated with this estimate is considered high (50%).
200-WA-1	216-Z-15	1949-1997	4.81E+01	12,708	There are no estimates for annual or total volume available for this site. To estimate annual and total discharge volumes, an average of 2 L loss/minute throughout the operating history of the site is assumed. This assumption results in ~1 mL of discharge per year, or ~48 mL of Z Complex stack drainage during its operating lifetime. The uncertainty associated with this estimate is considered high (50%).
200-WA-1	216-Z-16	1968-1977	1.02E+02	26,948	This site received almost 102 mL of 231-Z Metal laboratory waste over its operating lifetime. The annual volumes can be found in the following documents: ARH-1159; ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; ARH-3093, 4Q; ARH-CD-371, 4Q; ARH-CD-743, 4Q; and RHO-CD-34 4Q. The uncertainty associated with these volumes is considered low (10%).
200-WA-1	216-Z-17	1967-1968	3.68E+01	9,723	This site received almost 37 mL of 231-Z Metal laboratory waste over its operating lifetime. The annual volumes are in the following documents: ARH-486; ARH-1159; and ARH-CD-743, 4Q. The uncertainty associated with these volumes is considered low (10%).
200-PW-1	216-Z-18	1969-1973	3.86E+00	1,020	This site received ~4 mL of plutonium purification and americium recovery waste. The annual volumes of waste disposed to this site can be found in the following documents: ARH-1608; ARH-2015 Pt3; ARH-2353 Pt3; ARH-2757 Pt3; ARH-2806, 4Q; and ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be moderate (25%).
200-CW-5	216-Z-19	1971-1981	6.16E+03		The 216-Z-19 Ditch is a backfilled, surface stabilized site. The ditch is currently co-located within a large Underground Radioactive Material area that includes the 216-Z-1D and 216-Z-11 ditches. The site received chemical sewer waste, Lab, and cooling water from the Z Complex.
200-PW-1	216-Z-1A	1949-1959; 1964-1969	6.21E+00	1,641	This site received over 6 mL of plutonium and americium recovery waste, and Z Complex chemical sewer. This site also includes inventories from separately reported sites (Z-1AA, Z-1AB, and Z-1AC) consolidated with the 216-Z-1A. Both aqueous and organic waste streams were disposed to this site. The annual volumes of waste disposed to this site are in the following documents: BNWC-91; ISO-98; ISO-698; ARH-486; ARH-1159; and ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-CW-5	216-Z-1D	1954-1958	1.97E+04	5.2E+05	The 216-Z-1D Ditch is a backfilled, surface stabilized ditch that runs from a point east of the 231-Z Building, curving southward to the 216-U-10 Pond. In 1949, the northern portion of the ditch was backfilled. The backfilled portion of the ditch was replaced with an underground pipeline (see sitecode 200-W-125-PL) to transport 231-Z effluent. The southern portion of the ditch is co-located within a large Underground Radioactive Material area that also includes the 216-Z-11 and 216-Z-19 ditches. The site received chemical sewer waste, cooling water and lab waste from the Z Complex area.
200-CW-5	216-Z-20	1982-1995	4.19E+03	1,107,001	This site received ~4,200 mL of Z Complex chemical sewer waste, Z Complex cooling water, and plutonium recovery waste. The majority of the waste disposed is considered chemical sewer and cooling water. The annual volumes are in the following documents: RHO-HS-SR-81-3 4Q LIQ; RHO-HS-SR-82-3 4Q LIQ; RHO-HS-SR-83-3 4QLIQ-P; RHO-HS-SR-84-3 4Q LIQ P; RHO-HS-SR-85-3 4Q LIQ P; RHO-HS-SR-86-3 4Q LIQ P; WHC-EP-0141; WHC-EP-0141-1; WHC-EP-0141-2; WHC-EP-0527; WHC-EP-0527-1; WHC-EP-0527-2; WHC-EP-0527-3; WHC-EP-0527-4; and WHC-EP-0527-5. Uncertainty associated with most of these volumes is considered low (10%). The plutonium recovery waste contribution is estimated using waste stream concentration and site inventory information regarding Pu-239 and is represented by an asymmetric triangular distribution with a maximum of 500 L.
200-WA-1	216-Z-21	1981-1995	1.57E+03	414,795	This site received 1,568 mL of Z Complex stack drainage. DOE/RL-91-58 assuming an annual discharge rate of 98 mL/yr. This volume is considered to have a moderate (25%) uncertainty.
200-PW-1	216-Z-3	1952-1959	1.78E+02	47,028	This site received ~180 mL of Z Complex laboratory waste and 234-5Z waste. The annual volumes of waste disposed to this site are in the following documents: HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; and ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be moderate (25%).
200-WA-1	216-Z-4	1945	1.10E-02	3	This site received 11,000 L of Z Complex laboratory waste and 234-5Z waste. The volume of waste disposed to this site are in ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be mostly moderate (25%).
200-PW-6	216-Z-5	1945-1947	3.10E+01	8,190	This site received 31 mL of Z Complex laboratory waste and plutonium recovery waste. The volumes of waste disposed to this site can are in ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be mostly moderate (25%).

Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes
200-WA-1	216-Z-6	1945	9.80E-02	26	This site received 98,000 L of Z Complex laboratory waste and 234-5Z waste. The volume of waste disposed to this site is in ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be mostly moderate (25%).
200-WA-1	216-Z-7	1947-1957; 1965-1966	7.99E+01	21,110	This site received 80 mL of Z Complex laboratory waste, plutonium recovery waste and decontamination waste. The volumes of waste disposed to this site are in the following documents: HW-28121; HW-33591; HW-38562; HW-44784; HW-48518; HW-53336; ISO-98; ISO-698; and ARH-CD-743, 4Q. The contributing wastes and volumes for years where laboratory waste and plutonium recovery waste are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for these site discharges are considered to be moderate (25%). At the end of this site's service life, it received decontamination waste only, and the uncertainties for those volumes are considered low (10%).
200-PW-6	216-Z-8	1957-1961	9.59E-03	3	This site received 9590 L of Z Complex stack drainage and plutonium recovery waste. The majority of the waste disposed is considered to be stack drainage. Annual volumes are in the following documents: HW-55593; HW-57649; HW-59359; HW-63646; HW-64375; HW-69071; HW-69072; HW-71971; HW-72956; and ARH-CD-743 4Q. The uncertainty associated with these volumes is considered low (10%). The plutonium recovery waste contribution is estimated using waste stream concentration and site inventory information regarding Pu-239 and is represented by an asymmetric triangular distribution with a maximum of 500 L.
200-PW-1	216-Z-9	1955-1962	4.09E+00	1,081	This site received over 4 mL of plutonium recovery waste. Both aqueous and organic waste streams were disposed to this site. The annual volumes of waste disposed to this site are in the following documents: HW-38562; HW-44784; HW-48518; HW-53336; HW-55593; HW-57649; HW-59359; HW-63646; HW-69375; HW-69071; HW-69072; HW-71971; HW-72956; HW-76638; and ARH-CD-743, 4Q. The contributing wastes and volumes are derived using the site inventory and waste concentration values for Cs-137, Sr-90, uranium, and Pu-239 as a basis. The uncertainties for this site are considered to be moderate (25%).

*Updated from Table A5-21 of RPP-26744.

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Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes

ARH-1608, 1970, *Radioactive Co111ami11atio11 in Liquid Wastes Discharged to Ground within the Chemical Separations Area Control Zone through 1969*, Atlantic Richfield Hanford Company, Richland, Washington.

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Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes

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Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes

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Table G-1. Descriptions for Sites Other than Tank Leaks and Unplanned Releases*

Corresponding SIM-v2 OU	Site	Operating Years	Site Volume (mL)	kgal	Site Description--Principal Wastes

Cs-137 = cesium-137
HDW = Hanford-defined waste model
ITS = in-tank solidification
OU = operable unit
PRTR = Plutonium Recycle Test Reactor
Pu-239 = plutonium-239
PUREX = plutonium-uranium extraction
REDOX = reduction-oxidation
SIM = soil inventory model
Sr-90 = strontium-90
TBP = tributyl phosphate
UNH = uranyl nitrate hexahydrate
UPR = unplanned release
WIDS = Waste Information Data System

Appendix H

SIMwaste Descriptions and References

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Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
1	1C Evap (BT2)	RPP-19822
2	1C1 (BT1)	
3	1C2 (BT2)	
4	1CFeCN (BT2)	
5	209-E Reflector Wtr (BT1)	WHC-EP-0342, Addendum 31
6	209-E Reflector Wtr (BT2)	
7	209-E Reflector Wtr (P1)	
8	209-E Reflector Wtr (P2)	
9	209-E Reflector Wtr (P2')	
10	209-E Reflector Wtr (P3)	
11	222-S Lab Wst (P1)	WHC-EP-0342, Addendums 9 and 13 with scaling factors
12	222-S Lab Wst (P2)	
13	222-S Lab Wst (P2')	
14	222-S Lab Wst (P3)	
15	222-S Lab Wst Wtr (P2)	WHC-EP-0342, Addendums 13 and 10
16	222-S Lab Wst Wtr (P2')	
17	222-S Lab Wst Wtr (P3)	
18	222-S Lab Wst Wtr (R1)	
19	222-S Lab Wst Wtr (R2)	
20	224 (BT1)	RPP-19822
21	224 (BT2)	
22	231-Z Metal Lab (Z2)	12362-90-LHR-072; HNF-1989; DOE/RL-91-58; HNF-1744
23	232-Z Inc (Z1)	
24	232-Z Inc (Z2)	
25	234-5Z (BT1) D-6	HNF-1744; WHC-EP-0342, Addendum 8
26	234-5Z (Z1) D-6	
27	234-5Z (Z2) D-6	
28	242-A Cond (P2')	WHC-EP-0342, Addendum 26
29	242-A Cond (P3)	
30	242-A Cond_CT (P3)	
31	242-B (BT2) Evap Cond	WHC-EP-0342, Addendum 17
32	242-S Evap Cond (R2)	WHC-EP-0342, Addendum 29
33	242-T Evap Cond (R2)	WHC-EP-0342, Addendum 17

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
34	242-T Evap Cond (Z2)	WHC-EP-0342, Addendum 29 with miscellaneous derivation
35	242-Z Am Rec (Z2)	12362-90-LHR-072; HNF-1989; Mercer (1986); HNF-1744
36	2C1 (BT1)	RPP-19822
37	2C2 (BT2)	
38	300 CW (Z1)	Mercer (1986) with RPP-19822
39	300 CW (Z2)	
40	5-6 (BT1)	RPP-19822, with assumed dilution
41	5-6 (BT2)	RPP-19822, with assumed dilution
42	A1-SltCk(Z2)	RPP-19822
43	A2-SltSlr(Z2)	Unused (RPP-19822)
44	BiPO4 (BT1) Chem Sewer	Derived from RPP-19822 sources
45	BiPO4 (BT1) Cool Wtr-Stm Cond	Derived from RPP-19822 sources
46	BiPO4 (BT1) Stack Drain	
47	BiPO4 (BT2) Chem Sewer	
48	BiPO4 (BT2) Cool Wtr-Stm Cond	
49	BiPO4 (BT2) Stack Drain	
50	BYSLT (BT2)	RPP-19822
51	CEM(NA)	Unused (RPP-19822)
52	Conc Misc UNH Streams (P1)	WHC-EP-0342, Addendum 19 and RPP-19822 assumption
53	Conc Misc UNH Streams (P2)	
54	Conc Misc UNH Streams (P2')	
55	Conc Misc UNH Streams (P3)	
56	Conc Misc UNH Streams (R1)	
57	Conc Misc UNH Streams (R2)	
58	CWP1 (CWP1)	RPP-19822
59	CWP2 (CWP2)	
60	CWR1 (CWR1)	
61	CWR2 (CWR2)	
62	CWZr1 (CWZr1)	
63	CWZr2 (CWZr2)	Unused (RPP-19822)
64	DE(NA)	
65	Decon Stack Drain (BT2)	Derived from RPP-19822 sources
66	Decon Stack Drain (R2)	

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
67	Decon Wst (BT1)	Derived from RPP-19822 sources
68	Decon Wst (BT2)	
69	Decon Wst (P1)	
70	Decon Wst (P2)	
71	Decon Wst (P2')	
72	Decon Wst (P3)	
73	Decon Wst (R1)	Defunct
74	Decon Wst (R2)	Derived from RPP-19822 sources
75	Dil Misc UNH Streams (BT2)	WHC-EP-0342, Addendum 19
76	Dil Misc UNH Streams (P1)	
77	Dil Misc UNH Streams (P2)	
78	Dil Misc UNH Streams (P2')	
79	Dil Misc UNH Streams (P3)	
80	Dil Misc UNH Streams (R1)	
81	Dil Misc UNH Streams (R2)	
82	ITS Cool Wtr-Cond (BT2)	Derived using average of 242-B and 242-S Condensates
83	Laundry Wst Wtr (BT1)	RHO-HS-SR-81-3 WHC-EP-0527 RHO-HS-SR-81-3-4Q-LIQ WHC EP 0527 1 RHO-HS-SR-82-3-4Q-LIQ WHC EP 0527 2 RHO-HS-SR-84-3-4Q-LIQ-P WHC EP 0527 3 RHO-HS-SR-85-3-4Q-LIQ-P WHC EP 0527 4 RHO HS SR-86-3-4Q-LIQ WHC EP 0527 5 RHO HS SR-86-3-4Q-LIQ-P WHC EP 0527 6 WHC-EP-0141-1 WHC EP 0527 7 WHC-EP-0141-2
84	Laundry Wst Wtr (BT2)	
85	Laundry Wst Wtr (P2')	
86	Laundry Wst Wtr (P3)	
87	Laundry Wst Wtr (R2)	
88	MW1 (BT1)	RPP-19822
89	MW2 (BT2)	
90	N Decon Wst (P2)	Derived from RPP-19822 sources
91	NIT(NA)	Unused (RPP-19822)
92	OrgSltCk(P2')	Defunct
93	P3AZ1(P3)	Unused (RPP-19822)
94	P3AZ2(P3)	
95	PASF (P2)	RPP-19822; HNF-1744
96	PASF (P2')	RPP-19822; RHO-CD-673, Part 1, pp. 102-105, PSS Line Leak (Line No. 812); HNF-1744
97	PASF (P3)	

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
98	PFeCN1 (BT1)	RPP-19822
99	PFeCN2 (BT2)	
100	Powerhouse Wst Wtr (NA)	WHC-SD-LEF-RPT-001
101	PUREX (all) Stack Drain WC	WHC-EP-0342
102	PUREX (P1) Chem Sewer	WHC-EP-0342, Addendum 2, scaled to timeframe
103	PUREX (P1) Cold Start	RPP-19822
104	PUREX (P1) Cool Wtr-Stm Cond	WHC-EP-0342, Addendum 20 and 216-A-25 data (HNF-1744; DOE/RL-92-05; and RHO-HS-SR-84-3-4Q-LIQ)
105	PUREX (P1) Org Wst	RPP-19822; HW-31000-DEL
106	PUREX (P1) Org Wst aqu_OWW1	RPP-19822
107	PUREX (P1) Org Wst aqu_OWW2	
108	PUREX (P1) Stack Drain	Derived from RPP-19822 sources
109	PUREX (P1) Tank Farm Cond	WHC-EP-0342, Addendum 26
110	PUREX (P2) Chem Sewer	WHC-EP-0342, Addendum 2 scaled to timeframe
111	PUREX (P2') Chem Sewer	
112	PUREX (P2) Cool Wtr-Stm Cond	WHC-EP-0342, Addendum 20 and 216-A-25 data (HNF-1744; DOE/RL-92-05; and RHO-HS-SR-84-3-4Q-LIQ)
113	PUREX (P2') Cool Wtr-Stm Cond	
114	PUREX (P2) Org Wst	RPP-19822; HW-31000-DEL
115	PUREX (P2') Org Wst	
116	PUREX (P2) Org Wst aqu_OWW1	RPP-19822
117	PUREX (P2) Org Wst aqu_OWW2	
118	PUREX (P2') Org Wst aqu_OWW3	
119	PUREX (P2) Stack Drain	Derived from RPP-19822 sources
120	PUREX (P2') Stack Drain	
121	PUREX (P2) Tank Farm Cond	WHC-EP-0342, Addendum 23
122	PUREX (P2') Tank Farm Cond	
123	PUREX (P3) Chem Sewer	WHC-EP-0342, Addendum 2
124	PUREX (P3) Cool Wtr-Stm Cond	WHC-EP-0342, Addendum 20 and 216-A-25 data (HNF-1744; DOE/RL-92-05; and RHO-HS-SR-84-3-4Q-LIQ)
125	PUREX (P3) Process Cond	WHC-EP-0342, Addendum 12
126	PUREX (P3) Stack Drain	Derived from RPP-19822 sources
127	PUREX (P3) Tank Farm Cond	WHC-EP-0342, Addendum 23
128	PUREX P1 (P1)	RPP-19822
129	PUREX P2 (P2)	

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
130	PUREX P2' (P2')	Unused (RPP-19822)
131	PUREX P3 (P3)	Defunct
132	PUREX PL1 (P1)	RPP-19822
133	PUREX PL2 (P3)	Unused (RPP-19822)
134	R1 (R1)	RPP-19822
135	R2 (R2)	
136	Recuplex (BT1) aqu	12362-90-LHR-072; HNF-1989; Mercer (1986); HNF-1744
137	Recuplex (BT1) org.	
138	Recuplex (Z1) aqu	
139	Recuplex (Z1) org.	
140	Recuplex (Z2) aqu	
141	Recuplex (Z2) org.	
142	REDOX (P2') Cool Wtr	Derived from RPP-19822 sources
143	REDOX (P2') Stack Drain	
144	REDOX (P2') Tank Farm Cond	WHC-EP-0342, Addendum 26
145	REDOX (P3) Stack Drain	Derived from RPP-19822 sources
146	REDOX (R1) Chem Sewer	Defunct
147	REDOX (R1) Cool Wtr	Derived from RPP-19822 sources
148	REDOX (R1) Org	Derived from RPP-19822 sources; HW-18700
149	REDOX (R1) Tank Farm Cond	WHC-EP-0342, Addendum 29
150	REDOX (R2) Chem Sewer	Defunct
151	REDOX (R2) Cool Wtr	Derived from RPP-19822 sources
152	REDOX (R2) Org	Derived from RPP-19822 sources; HW-18700
153	REDOX (R2) Tank Farm Cond	WHC-EP-0342, Addendum 29
154	REDOX Cold Start (R1)	Derived from RPP-19822 sources
155	REDOX Cold Start (R1) Org	Derived from RPP-19822 sources; HW-18700
156	REDOX D-1 (R1)	HW-59359; HW-60115; DOE/RL-91-60 (DOE-RL 1992c); HNF-1744 (Diediker 1999); RHO-CD-673 (Maxfield 1979)
157	REDOX D-1 (R2)	HW-59359 (Baldridge 1959); HW-60115 (GE 1959); DOE/RL-91-60 (DOE-RL 1992c); HNF-1744 (Diediker 1999); RHO-CD-673 (Maxfield 1979)
158	REDOX D-2 (R1)	HW-59359 (Baldridge 1959); HW-60115 (GE 1959); DOE/RL-91-60 (DOE-RL 1992c); HNF-1744 (Diediker 1999); RHO-CD-673 (Maxfield 1979)

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
159	REDOX D-2 (R2)	HW-59359 (Baldridge 1959) ; HW-60115; (GE 1959) DOE/RL-91-60 (DOE-RL 1992c); HNF-1744 (Diediker 1999); RHO-CD-673 (Maxfield 1979)
160	REDOX Stack Drain (R1)	Derived from HDW Rev. 5 sources (Higley et al. 2004)
161	REDOX Stack Drain (R2)	Derived from HDW Rev. 5 sources (Higley et al. 2004)
162	RG Process (BT1)	Barrington (1990); HNF-1989 Rev. 1 (Jones 1998); HNF-1744 (Diediker 1999)
163	RG Process (Z1)	Defunct
164	RG Process (Z2)	Defunct
165	RSLT (R2)	HDW Rev. 5 (Higley et al. 2004)
166	S1-SltCk(P2')	HDW Rev. 5 (Higley et al. 2004)
167	S2-SltSlr(P2')	HDW Rev. 5 (Higley et al. 2004)
168	Salt Slurry(P2')	Unused--HDW Rev. 5 (Higley et al. 2004)
169	Spent Nitric Acid (BT2)	HW-31000-DEL (GE 1955) w/misc derivation
170	Spent Nitric Acid (P1)	HW-31000-DEL (GE 1955)
171	Spent Nitric Acid (P2)	HW-31000-DEL (GE 1955)
172	Spent Nitric Acid (P2')	HW-31000-DEL (GE 1955)
173	Spent Nitric Acid (P3)	HW-31000-DEL (GE 1955)
174	Spent Nitric Acid (R1)	HW-31000-DEL (GE 1955) w/misc derivation
175	Spent Nitric Acid (R2)	HW-31000-DEL (GE 1955) w/misc derivation
176	Sr-Cs Rec (P1) Cool Wtr	WHC-EP-0342, Addendum 22
177	Sr-Cs Rec (P1) Stack Drain	WHC-EP-0342, Addendum with miscellaneous derivation
178	Sr-Cs Rec (P2') Chem Sewer	WHC-EP-0342, Addendum 6
179	Sr-Cs Rec (P2) Cool Wtr	WHC-EP-0342, Addendum 22
180	Sr-Cs Rec (P2') Cool Wtr	
181	Sr-Cs Rec (P2) Stack Drain	WHC-EP-0342, Addendum 17 with miscellaneous derivation
182	Sr-Cs Rec (P2') Stack Drain	
183	Sr-Cs Rec (P3) Chem Sewer	WHC-EP-0342, Addendum 6
184	Sr-Cs Rec (P3) Cool Wtr	WHC-EP-0342, Addendum 22
185	Sr-Cs Rec (P3) Stack Drain	WHC-EP-0342, Addendum 17 with miscellaneous derivation
186	Sr-Cs Rec (R1) Chem Sewer	WHC-EP-0342, Addendum 6
187	Sr-Cs Rec (R1) Cool Wtr	WHC-EP-0342, Addendum 22
188	Sr-Cs Rec (R2) Chem Sewer	WHC-EP-0342, Addendum 6
189	Sr-Cs Rec Org Wst (P2)_B	RPP-19822

Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
190	Sr-Cs Rec Org Wst (P2')_CSR	
191	Sr-Cs Rec Org Wst aqu (P2)_BL	
192	Sr-Cs Rec Org Wst aqu(P2')_AR	
193	Sr-Cs Rec Wst (P1)_HS	RPP-19822
194	Sr-Cs Rec Wst (P2)_SRR	
195	T2-SltCk(P2')	
196	TBP-UR (BT2)	
197	TBP-UR Org Wst (BT2)	RPP-19822 and HW-19140 with derivation information
198	TFeCN (BT2)	RPP-19822
199	TH1 (TH2)	
200	TH2 (TH2)	
201	Z Complex Chem Sewer (NA)	65930-86-T-090; 65930-85-A-116
202	Z Complex Chem Sewer_NCT (NA)	
203	Z Complex Cool Wtr-Cond (BT1)	WHC-EP-0342, Addendum 8
204	Z Complex Cool Wtr-Cond (Z1)	
205	Z Complex Cool Wtr-Cond (Z2)	
206	Z Complex Lab Wst (BT1)	HNF-1989; HNF-1744
207	Z Complex Lab Wst (Z1)	
208	Z Complex Lab Wst (Z2)	
209	Z Complex Stack Drain (BT1)	Assumed 1.1 dilution of Z Complex cooling water
210	Z Complex Stack Drain (Z1)	
211	Z Complex Stack Drain (Z2)	
212	Z Complex Stack Drain_NCT (Z2)	
213	Z(Z2)	RPP-19822

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#	SIM Waste Stream Label	Reference Information

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Table H-1. Soil Inventory Model Waste Streams and Source Information

#	SIM Waste Stream Label	Reference Information
WHC-EP-0342, Addendum 12, 1990, *PUREX Plant Process Condensate Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021601.		
WHC-EP-0342, Addendum 13, 1990, *222-S Laboratory Wastewater Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021605.		
WHC-EP-0342, Addendum 17, 1990, *B Plant Process Condensate Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021612.		
WHC-EP-0342, Addendum 19, 1990, *UO_3 Plant Process Condensate Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021613.		
WHC-EP-0342, Addendum 2, 1990, *PUREX Plant Chemical Sewer Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196020537.		
WHC-EP-0342, Addendum 20, 1990, *PUREX Plant Cooling Water Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021615.		
WHC-EP-0342, Addendum 22, 1990, *B Plant Cooling Water Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021617.		
WHC-EP-0342, Addendum 23, 1990, *241-A Tank Farm Cooling Water Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021619.		
WHC-EP-0342, Addendum 26, 1990, *242-A Evaporator Steam Condensate Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021624.		
WHC-EP-0342, Addendum 29, 1990, *242-S Evaporator Steam Condensate Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021632.		
WHC-EP-0342, Addendum 31, 1990, *209-E Laboratory Reflector Water Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021635.		
WHC-EP-0342, Addendum 6, 1990, *B Plant Chemical Sewer Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196020546.		
WHC-EP-0342, Addendum 8, 1990, *Plutonium Finishing Plant Wastewater Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196020548.		
WHC-EP-0342, Addendum 9, 1990, *S Plant Wastewater Stream-Specific Report*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=D196021588.		
WHC-EP-0527, 1992, *Environmental Releases for Calendar Year 1990*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=E0021230.		
WHC-EP-0527-1, 1992, *Environmental Releases for Calendar Year 1991*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=E0023042.		
WHC-EP-0527-2, 1993, *Environmental Releases for Calendar Year 1992*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=E0029873.		
WHC-EP-0527-3, 1994, *Environmental Releases for Calendar Year 1993*, Westinghouse Hanford Company, Richland, Washington. Available at: http://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=E0037893.		
WHC-EP-0527-4, 1995, *Environmental Releases for Calendar Year 1994*, Westinghouse Hanford Company, Richland, Washington. Available at: http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/27/007/27007726.pdf.		
WHC-EP-0527-5, 1996, *Environmental Releases for Calendar Year 1995*, Westinghouse Hanford Company, Richland, Washington. Available at: http://www.osti.gov/scitech/servlets/purl/663156.		
WHC-EP-0527-6, 1997, *Environmental Releases for Calendar Year 1996*, Fluor Daniel Hanford, Inc., Richland, Washington.		
WHC-EP-0527-7, 1998, *Environmental Releases for Calendar Year 1997*, Fluor Daniel Hanford, Inc., Richland, Washington. Available at: http://www.osti.gov/scitech/servlets/purl/10148979.		
WHC-SD-LEF-RPT-001, 1995, *Liquid Effluent Sampling & Analysis Plan Implementation Summary Report*, Westinghouse Hanford Company, Richland, Washington.		

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Appendix I

Operable Units

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Table

Table I-1. WIDS Groups SIMsites into Operable Units* I-1

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I1 Updated Operable Units

The current Waste Information Data System (WIDS) is the source for many of the SIMsites in Appendix G and WIDS further groups the 394 SIMsites into 25 operable units (OPU). This updated set of OPUs replaces those used in SIM-v1. SIM-v2 uses the updated OPUs to simplify the SIM-v2 presentation. The updated OPUs also reflect process-based sources and similarities between contaminant sources and management areas. Table I-1 shows the OPUs and WMAs considered in SIM-v2 with their common features and associated sites. More detailed SIM-site description is listed in Appendix G.

Table I-1. WIDS Groups SIMsites into Operable Units*

OPU/ WMA	Common Feature	SIM-v2 Sites
200-BC-1	BC cribs	216-B-14, 216-B-15, 216-B-16, 216-B-17, 216-B-18, 216-B-19, 216-B-20, 216-B-21, 216-B-22, 216-B-23, 216-B-24, 216-B-25, 216-B-26, 216-B-27, 216-B-28, 216-B-29, 216-B-30, 216-B-31, 216-B-32, 216-B-33, 216-B-34, 216-B-52, 216-B-53A, 216-B-53B, 216-B-54, 216-B-58
200-CB-1	Received combined building discharges	200-E-100, 200-E-28, 200-E-55, 200-E-85, 200-E-88, 200-E-89, 200-E-90, 200-E-91, 200-E-92, 200-E-93, 200-E-97, 200-E-98, 200-E-99, 216-B-13, 216-B-4, 216-B-60, UPR-200-E-1, UPR-200-E-80, UPR-200-E-85, UPR-200-E-87
200-CP-1	Received condensate process waster	200-E-107, 200-E-62, 200-E-63, 200-E-64, 200-E-65, 200-E-67, 200-E-69, 200-E-70, 200-E-71, 200-E-72, 200-E-73, 200-E-74, 200-E-75, 200-E-76, 200-E-77, 200-E-78, 200-E-79, 200-E-80, 200-E-81, 200-E-84, 216-A-12, 216-A-13, 216-A-14, 216-A-32, 216-A-35, 216-A-35, UPR-200-E-39
200-CR-1	Released chemicals from/near redox process	UPR-200-W-61, UPR-200-W-96
200-CW-1	Received cooling water waste	216-A-25, 216-B-3, 216-S-16P, 216-S-17, 216-U-10
200-CW-3	Received condensate/cooling water waste	215-N-6, 216-N-1, 216-N-2, 216-N-3, 216-N-4, 216-N-5, 216-N-7
200-CW-5	Received condensate/cooling water waste	216-Z-11, 216-Z-19, 216-Z-1D, 216-Z-20
200-DV-1	Contributing to deep vadose zone	216-B-11A&B, 216-B-35, 216-B-36, 216-B-37, 216-B-38, 216-B-39, 216-B-40, 216-B-41, 216-B-42, 216-B-43, 216-B-44, 216-B-45, 216-B-46, 216-B-47, 216-B-48, 216-B-49, 216-B-5, 216-B-50, 216-B-57, 216-B-7A&B, 216-B-8, 216-B-9, 216-S-13, 216-S-21, 216-S-9, 216-T-14, 216-T-15, 216-T-16, 216-T-17, 216-T-18, 216-T-19, 216-T-21, 216-T-22, 216-T-23, 216-T-24, 216-T-25, 216-T-26, 216-T-3, 216-T-32, 216-T-5, 216-T-6, 216-T-7
200-EA-1	Grouped in 200 East Area	200-E-103, 200-E-25, 200-E-4, 200-E-41, 200-E-54, 200-E-56, 200-E-57, 200-E-68, 200-E-82, 200-E-94,

Table I-1. WIDS Groups SIMsites into Operable Units*

OPU/ WMA	Common Feature	SIM-v2 Sites
		200-E-95, 216-A-1, 216-A-10, 216-A-15, 216-A-18, 216-A-19, 216-A-2, 216-A-20, 216-A-21, 216-A-22, 216-A-26, 216-A-26A, 216-A-27, 216-A-28, 216-A-3, 216-A-30, 216-A-36A, 216-A-37-1, 216-A-37-2, 216-A-4, 216-A-40, 216-A-40, 216-A-41, 216-A-45, 216-A-5, 216-A-6, 216-A-9, 216-B-10A, 216-B-10B, 216-B-12, 216-B-51, 216-B-55, 216-B-59, 216-B-6, 216-B-62, 216-B-63, 216-BY-201, 216-C-1, 216-C-10, 216-C-2, 216-C-3, 216-C-4, 216-C-5, 216-C-6, 216-C-7, UPR-200-E-117, UPR-200-E-40, UPR-200-E-9
200-WA-1	Grouped in 200 West Area	200-W-22, 200-W-42, 200-W-9, 200-W-PP, 216-S-1&2, 216-S-12, 216-S-14, 216-S-20, 216-S-22, 216-S-23, 216-S-25, 216-S-3, 216-S-4, 216-S-5, 216-S-6, 216-S-7, 216-S-8, 216-T-12, 216-T-2, 216-T-20, 216-T-27, 216-T-28, 216-T-29, 216-T-33, 216-T-34, 216-T-35, 216-T-36, 216-T-8, 216-U-1&2, 216-U-12, 216-U-13, 216-U-14, 216-U-15, 216-U-16, 216-U-17, 216-U-3, 216-U-4, 216-U-4A, 216-U-4B, 216-U-5, 216-U-6, 216-U-7, 216-U-8, 216-Z-13, 216-Z-14, 216-Z-15, 216-Z-16, 216-Z-17, 216-Z-21, 216-Z-4, 216-Z-6, 216-Z-7, UPR-200-W-101, UPR-200-W-103, UPR-200-W-138, UPR-200-W-163, UPR-200-W-19, UPR-200-W-20, UPR-200-W-33, UPR-200-W-39, UPR-200-W-82, UPR-200-W-95
200-IS-1	Unplanned releases from *Tanks/Lines/Pits/Boxes/ Septic Tank and Drain Fields*	UPR-200-W-2, UPR-200-E-145, UPR-200-E-3, UPR-200-E-7, UPR-200-E-77, UPR-200-E-78, UPR-200-E-79, UPR-200-E-84, UPR-200-E-86, UPR-200-W-102, UPR-200-W-130, UPR-200-W-131, UPR-200-W-135, UPR-200-W-21, UPR-200-W-28, UPR-200-W-29, UPR-200-W-32, UPR-200-W-38, UPR-200-W-97, UPR-200-W-98
200-OA-1	Ponds and cribs receiving facility and laundry WW	2101-M-Pond, 216-S-10P, 216-S-19, 216-S-26, 216-T-1, 216-W-LWC
200-PW-1	Received plutonium/organic rich process waste	216-Z-1&2, 216-Z-12, 216-Z-18, 216-Z-1A, 216-Z-3, 216-Z-9, 241-Z-361
200-PW-3	Received organic rich process waste	216-A-24, 216-A-31, 216-A-7, 216-A-8
200-PW-6	Received plutonium fission product-rich process waste	216-Z-10, 216-Z-5, 241-Z-8
200-SW-2	Shallow water pond/swamp	216-C-9, 216-T-4A
WMA-A-AX	Tank leaks, discharges and unplanned releases in A/AX tank farms waste management area	216-A-16, 216-A-17, 216-A-23A, 216-A-23B, 216-A-39, 241-A-103, 241-A-104, 241-A-105, 241-AX-102, UPR-200-E-117, UPR-200-E-119

Table I-1. WIDS Groups SIMsites into Operable Units*

OPU/ WMA	Common Feature	SIM-v2 Sites
WMA-B-BX-BY	Tank leaks, discharges and unplanned releases in B/BX/BY tank farms waste management area	200-E-60, 241-B-107, 241-B-110, 241-B-112, 241-B-201, 241-B-203, 241-B-204, 241-BX-101, 241-BX-102, 241-BX-108, 241-BY-101, 241-BY-103, 241-BY-105, 241-BY-106, 241-BY-107, 241-BY-108, UPR-200-E-105, UPR-200-E-108, UPR-200-E-109, UPR-200-E-110, UPR-200-E-38, UPR-200-E-6, UPR-200-E-73, UPR-200-E-73, UPR-200-E-74, UPR-200-E-75, UPR-200-E-75
WMA-C	Tank leaks, discharges and unplanned releases in C tank farm waste management area	216-C-8, 241-C-101, 241-C-104, 241-C-105, 241-C-108, 241-C-110, 241-C-111, 241-C-112, 241-C-201, 241-C-202, 241-C-203, 241-C-204, UPR-200-E-107, UPR-200-E-16, UPR-200-E-81, UPR-200-E-82
WMA-S-SX	Tank leaks in S/SX tank farms waste management area	241-S-104, 241-SX-104, 241-SX-107, 241-SX-108, 241-SX-109, 241-SX-110, 241-SX-111, 241-SX-112, 241-SX-113, 241-SX-114, 241-XS-115
WMA-T	Tank leaks in T tank farm waste management area	241-T-101, 241-T-102, 241-T-103, 241-T-106, 241-T-108, 241-T-109, 241-T-111
WMA-TX-TY	Tank leaks and unplanned releases in TX/TY tank farms waste management area	214-TX-104, 214-TX-105, 214-TX-114, 214-TX-118, 214-TY-104, 241-TY-105, 241-TX-107, 241-TY-101, 241-TY-103, 241-TY-106, UPR-200-W-100, UPR-200-W-12, UPR-200-W-127
WMA-U	Tank leaks and unplanned releases in U tank farm waste management area	241-U-101, 241-U-104, 241-U-110, 241-U-112, UPR-200-W-132, UPR-200-W-24
Not-accepted	Classified as not-accepted in WIDS	200-W-72, UPR-200-E-141
Proposed-not-accepted	Classified as proposed-not-accepted in WIDS	200-E-61
Rejected	Classified as rejected in WIDS	UPR-200-W-74, UPR-200-W-87

*Including waste management areas (WMAs) of grouped tank farm releases.

I2 Other Operable Units

The three OPUs encompassing 41% of the SIMsites are 200-DV-1 with 42 SIMsites, 200-EA-1 with 58 SIMsites, and 200-WA-1 with 62 SIMsites mapped in Figure I-1 to Figure I-3. The OPU-200-DV-1

consists of sites with large release volumes encompassing trenches around the three complexes: B in East Area and T and S in West Area, where contamination in the deep vadose zone resides. The cribs and trenches received supernatant overflows from the single-shell tanks to support fuel separation operations in the early bismuth phosphate campaigns.

In Figure I-1, the OPU SIMsites show the deep vadose contamination from intentional tank overflows in both the East and West Areas. Figure I-2 shows mildly contaminated condensate and cooling water discharge SIMsites in the East Area. Finally, Figure I-3 displays SIMsites with mildly contaminated condensate and cooling water discharge in the West Area.

The other two OPUs 200-EA-1 in East Area and 200-WA-1 in West Area received more diluted wastes (e.g., from steam condensation and chemical waste sewers). Unlike 200-DV-1, the 200-EA-1 and 200-WA-1 carried little contamination.

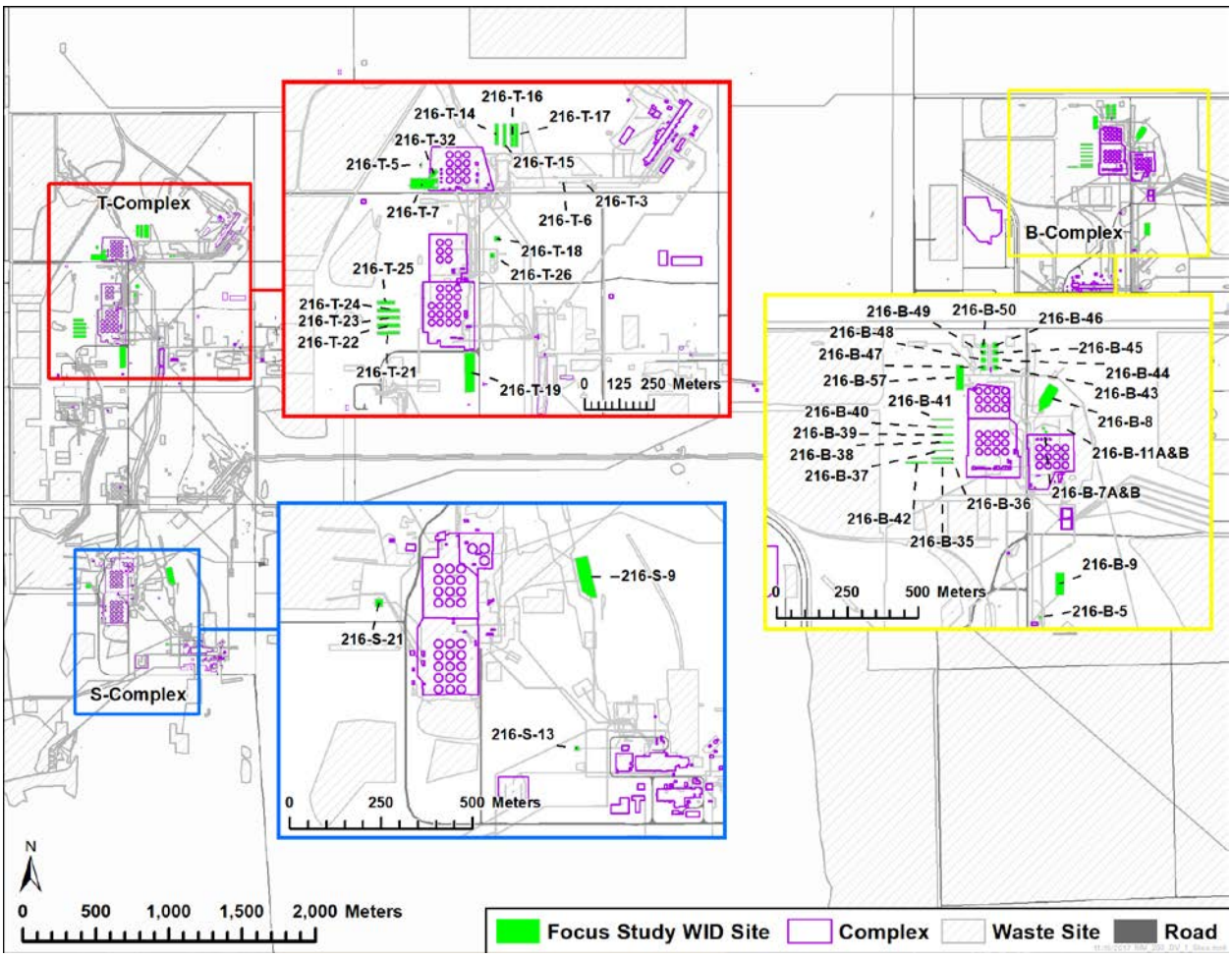

Figure I-1. OPU 200-DV-1 SIMsites, East and West Areas

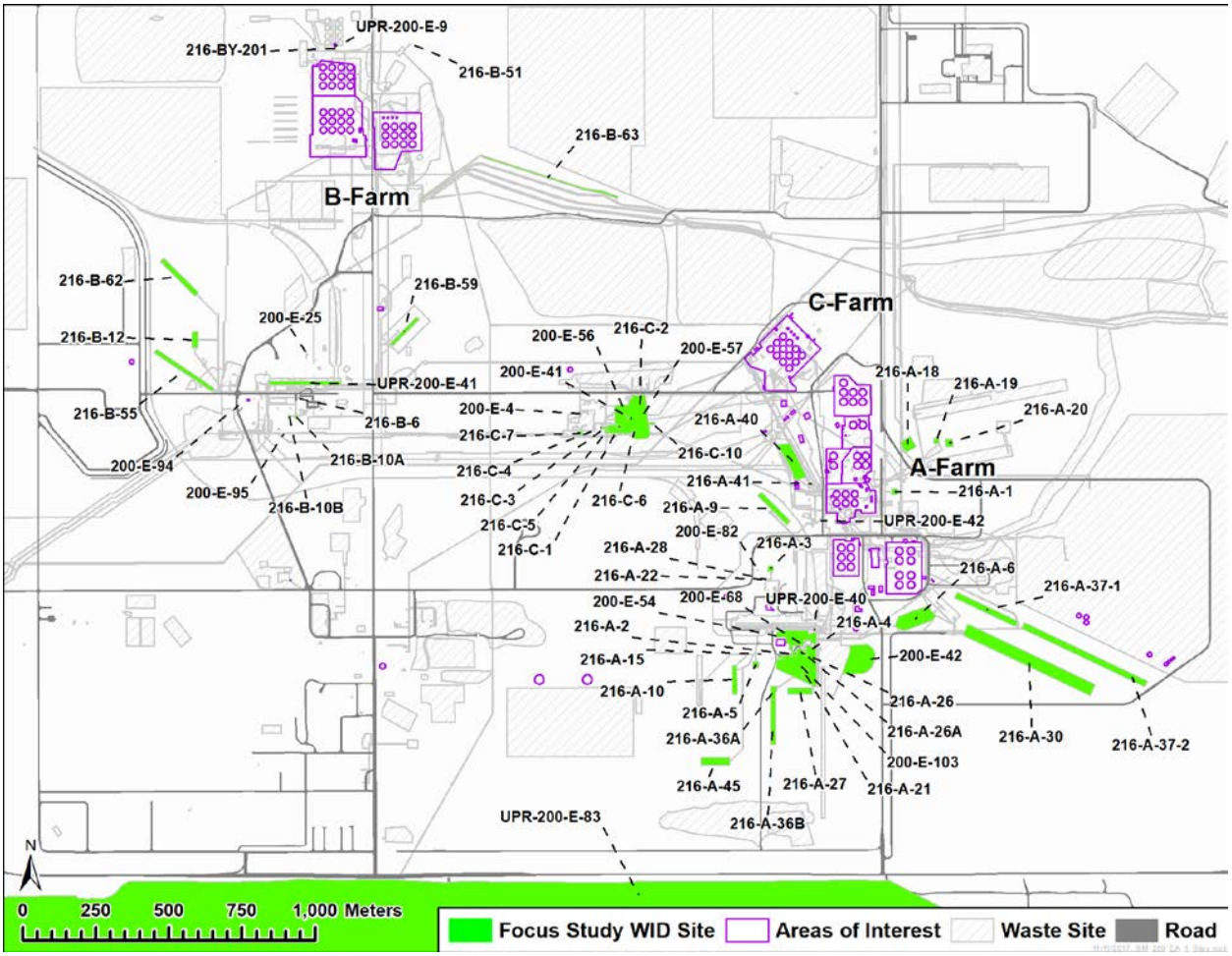

Figure I-2. OPU 200-EA-1SIMsites, East Area

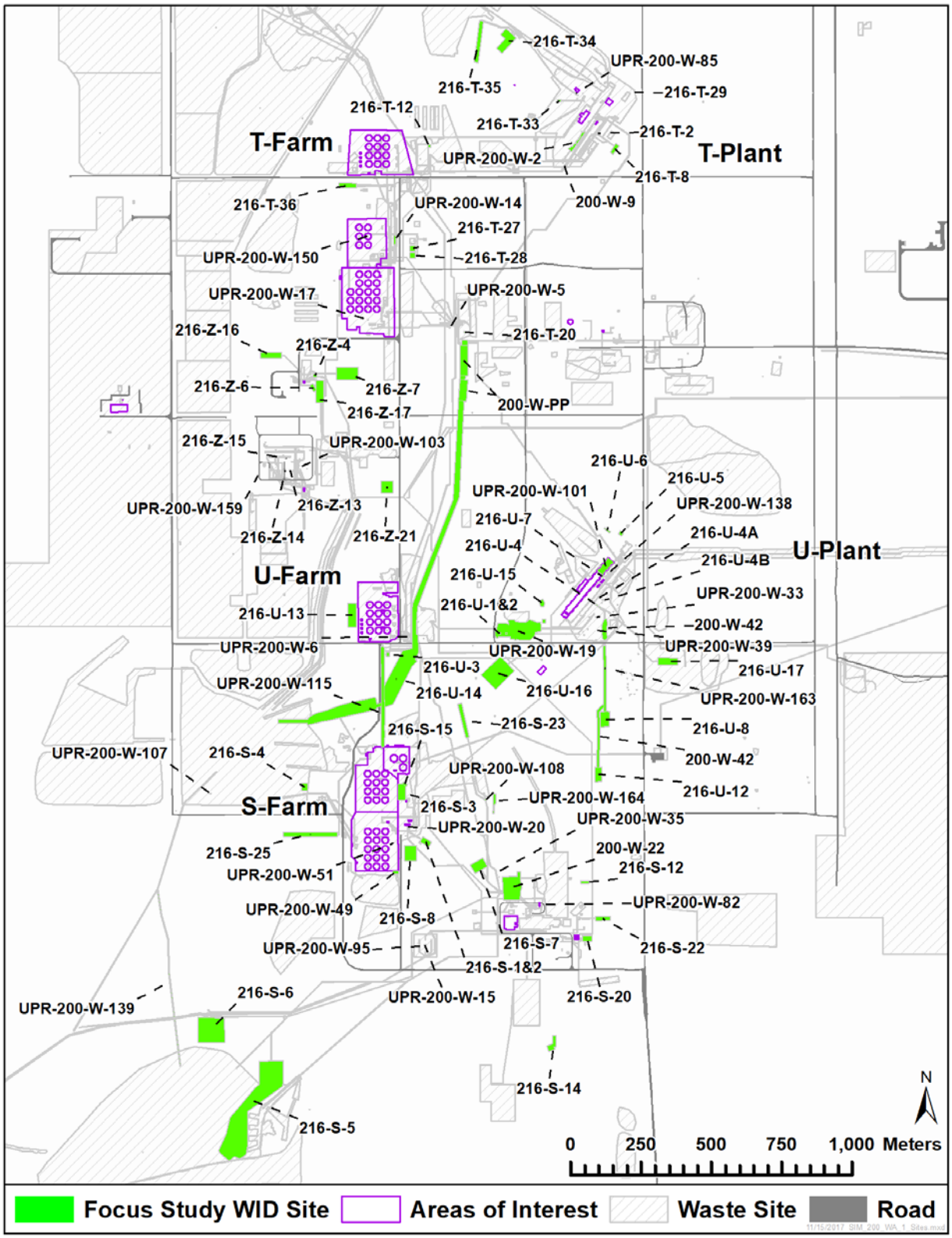

Figure I-3. OPU 200-WA-1 SIMsites, West Area

Appendix J

Site Total Inventory of the 46 Radionuclides Evaluated by SIM

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OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-BC-1	216-B-14	Liquid	8.71E+00	5.41E+01	2.10E+00	7.13E-02	6.23E+00	1.63E+00	9.47E-02	5.61E+02
200-BC-1	216-B-15	Liquid	6.32E+00	4.19E+01	1.62E+00	7.03E-02	6.15E+00	1.26E+00	7.32E-02	1.79E+02
200-BC-1	216-B-16	Liquid	5.64E+00	3.52E+01	1.33E+00	5.46E-02	4.83E+00	1.22E+00	5.82E-02	1.46E+02
200-BC-1	216-B-17	Liquid	3.48E+00	1.87E+01	6.49E-01	2.23E-02	2.08E+00	8.89E-01	2.60E-02	7.26E+01
200-BC-1	216-B-18	Liquid	8.52E+00	5.64E+01	2.19E+00	9.48E-02	8.28E+00	1.70E+00	9.87E-02	2.41E+02
200-BC-1	216-B-19	Liquid	5.53E+00	3.70E+01	1.34E+00	5.04E-02	4.57E+00	1.54E+00	5.61E-02	1.49E+02
200-BC-1	216-B-20	Liquid	4.74E+00	2.77E+01	1.01E+00	3.90E-02	3.52E+00	1.11E+00	4.30E-02	1.12E+02
200-BC-1	216-B-21	Liquid	4.68E+00	3.02E+01	1.15E+00	4.89E-02	4.30E+00	9.73E-01	5.15E-02	1.27E+02
200-BC-1	216-B-22	Liquid	4.78E+00	2.93E+01	1.09E+00	4.43E-02	3.94E+00	1.06E+00	4.76E-02	1.21E+02
200-BC-1	216-B-23	Liquid	4.56E+00	2.79E+01	1.04E+00	4.20E-02	3.74E+00	1.01E+00	4.53E-02	1.15E+02
200-BC-1	216-B-24	Liquid	4.87E+00	3.23E+01	1.25E+00	5.42E-02	4.74E+00	9.73E-01	5.64E-02	1.38E+02
200-BC-1	216-B-25	Liquid	4.91E+00	3.25E+01	1.26E+00	5.46E-02	4.77E+00	9.81E-01	5.69E-02	1.39E+02
200-BC-1	216-B-26	Liquid	4.75E+00	3.14E+01	1.22E+00	5.28E-02	4.62E+00	9.48E-01	5.50E-02	1.34E+02
200-BC-1	216-B-27	Liquid	4.42E+00	2.93E+01	1.13E+00	4.92E-02	4.30E+00	8.83E-01	5.12E-02	1.25E+02
200-BC-1	216-B-28	Liquid	5.09E+00	3.15E+01	1.18E+00	4.83E-02	4.28E+00	1.11E+00	5.17E-02	1.31E+02
200-BC-1	216-B-29	Liquid	4.84E+00	3.09E+01	1.20E+00	4.54E-02	3.97E+00	9.32E-01	5.41E-02	2.41E+02
200-BC-1	216-B-30	Liquid	4.78E+00	2.77E+01	9.96E-01	3.72E-02	3.38E+00	1.17E+00	4.16E-02	1.11E+02
200-BC-1	216-B-31	Liquid	4.85E+00	2.81E+01	1.01E+00	3.79E-02	3.45E+00	1.18E+00	4.24E-02	1.13E+02
200-BC-1	216-B-32	Liquid	4.75E+00	2.71E+01	9.68E-01	3.40E-02	3.11E+00	1.16E+00	4.02E-02	1.38E+02
200-BC-1	216-B-33	Liquid	4.75E+00	2.61E+01	9.19E-01	2.96E-02	2.75E+00	1.19E+00	3.74E-02	1.51E+02
200-BC-1	216-B-34	Liquid	4.88E+00	2.68E+01	9.41E-01	3.07E-02	2.85E+00	1.23E+00	3.82E-02	1.47E+02
200-BC-1	216-B-52	Liquid	8.55E+00	4.70E+01	1.67E+00	5.11E-02	4.73E+00	2.08E+00	6.88E-02	3.46E+02
200-BC-1	216-B-53A	Liquid	5.49E-01	1.81E-02	1.44E-02	1.65E-05	1.59E-03	7.37E-03	7.29E-06	8.96E+00
200-BC-1	216-B-53B	Liquid	2.01E-02	1.05E-02	4.97E-04	9.56E-06	9.22E-04	8.52E-04	4.24E-06	5.21E+00
200-BC-1	216-B-54	Liquid	9.99E-01	1.05E-02	2.62E-02	9.56E-06	9.22E-04	1.21E-02	4.24E-06	5.21E+00
200-BC-1	216-B-58	Liquid	4.17E-01	8.40E-03	1.09E-02	7.65E-06	7.38E-04	5.27E-03	3.39E-06	4.17E+00
200-CB-1	200-E-100	Liquid	2.37E-01	1.47E-06	3.36E-08	9.34E-09	8.84E-07	9.84E-08	2.03E-09	1.60E-04
200-CB-1	200-E-28	Liquid	5.86E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-02
200-CB-1	200-E-55	Liquid	2.31E-01	4.08E-05	7.88E-07	2.33E-07	2.21E-05	9.12E-07	3.80E-08	9.51E-03
200-CB-1	200-E-85	Liquid	1.43E+00	3.88E-06	8.88E-08	1.42E-07	1.36E-05	7.15E-07	7.53E-09	7.89E-05
200-CB-1	200-E-88	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-CB-1	200-E-89	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-CB-1	200-E-90	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-CB-1	200-E-91	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-CB-1	200-E-92	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-CB-1	200-E-93	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-CB-1	200-E-97	Liquid	2.32E-01	4.16E-05	8.05E-07	2.38E-07	2.25E-05	9.32E-07	3.89E-08	9.62E-03
200-CB-1	200-E-98	Liquid	1.92E-01	3.47E-05	6.71E-07	1.98E-07	1.88E-05	7.77E-07	3.24E-08	7.98E-03
200-CB-1	200-E-99	Liquid	2.37E-01	1.47E-06	3.36E-08	9.34E-09	8.84E-07	9.84E-08	2.03E-09	1.60E-04
200-CB-1	216-B-13	Liquid	2.10E-02	6.24E-06	1.21E-07	3.57E-08	3.37E-06	1.40E-07	5.82E-09	1.09E-03
200-CB-1	216-B-4	Liquid	1.00E-02	1.19E-05	2.30E-07	6.79E-08	6.43E-06	2.66E-07	1.11E-08	1.32E-03
200-CB-1	216-B-60	Liquid	1.89E-02	3.45E-08	7.90E-10	1.26E-09	1.21E-07	6.36E-09	6.70E-11	7.02E-07
200-CB-1	UPR-200-E-1	Liquid	2.04E-02	5.93E-02	1.94E-03	3.92E-04	5.74E-02	2.27E-03	4.15E-05	5.55E+00
200-CB-1	UPR-200-E-80	Liquid	3.85E-03	4.47E-04	1.19E-05	3.20E-06	2.73E-04	5.80E-06	5.46E-07	9.55E-02
200-CB-1	UPR-200-E-85	Liquid	2.48E-03	4.88E-02	9.40E-03	1.74E-03	1.65E-01	5.94E-02	1.12E-03	6.14E+00
200-CB-1	UPR-200-E-87	Liquid	2.87E-02	4.99E-09	1.11E-05	2.91E-06	2.48E-04	5.28E-06	4.97E-07	1.79E-03
200-CP-1	200-E-107	Liquid	4.00E-03	7.30E-09	1.67E-10	2.67E-10	2.55E-08	1.35E-09	1.42E-11	1.48E-07
200-CP-1	200-E-62	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-63	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-64	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-65	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-67	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-69	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-70	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-71	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-72	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-73	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-74	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-75	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-76	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-77	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-78	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-CP-1	200-E-79	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-CP-1	200-E-80	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-CP-1	200-E-81	Liquid	4.56E-01	1.24E-06	2.84E-08	4.53E-08	4.34E-06	2.29E-07	2.41E-09	2.52E-05
200-CP-1	200-E-84	Liquid	2.53E-01	0.00E+00	9.88E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.09E-08
200-CP-1	216-A-11	Liquid	1.00E-01	0.00E+00	3.90E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-08
200-CP-1	216-A-12	Liquid	1.00E-01	0.00E+00	3.90E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-08
200-CP-1	216-A-13	Liquid	1.00E-02	2.72E-08	6.23E-10	9.95E-10	9.53E-08	5.02E-09	5.29E-11	5.54E-07
200-CP-1	216-A-14	Liquid	1.00E-03	2.72E-09	6.22E-11	9.94E-11	9.52E-09	5.02E-10	5.28E-12	5.53E-08
200-CP-1	216-A-32	Liquid	4.00E-03	1.09E-08	2.49E-10	3.98E-10	3.81E-08	2.01E-09	2.11E-11	2.21E-07
200-CP-1	216-A-35	Liquid	1.00E-02	2.72E-08	6.23E-10	9.94E-10	9.52E-08	5.02E-09	5.28E-11	5.53E-07
200-CP-1	UPR-200-E-39	Liquid	1.52E-03	1.42E-01	0.00E+00	0.00E+00	0.00E+00	1.65E-04	1.21E-05	1.12E+00
200-CR-1	UPR-200-W-61	Liquid	9.24E-04	2.30E-02	1.25E-03	1.48E-04	1.33E-02	1.69E-03	5.81E-05	2.06E+00
200-CR-1	UPR-200-W-96	Liquid	1.04E-03	1.48E-07	2.47E-09	1.88E-09	1.80E-07	1.18E-08	1.72E-10	3.99E-06
200-CW-1	216-A-25	Liquid	2.94E+05	8.74E+02	3.49E+01	1.34E-02	1.29E+00	2.43E-01	5.46E-03	2.90E+01
200-CW-1	216-B-3	Liquid	2.83E+05	2.01E+04	9.91E+01	3.22E-03	3.05E-01	5.18E-02	8.17E-04	1.34E+02
200-CW-1	216-S-16P	Liquid	4.07E+04	2.62E+00	8.47E-04	6.46E-04	6.16E-02	4.06E-03	5.91E-05	1.37E+00
200-CW-1	216-S-17	Liquid	6.44E+03	7.31E-01	1.62E-03	2.64E-04	2.43E-02	2.58E-03	7.78E-05	2.66E+00
200-CW-1	216-U-10	Liquid	1.27E+05	2.47E+02	2.02E-01	7.98E-04	7.63E-02	5.13E+00	5.96E-05	1.95E+00
200-CW-3	216-N-6	Liquid	9.47E+02	4.28E-04	8.27E-06	2.45E-06	2.31E-04	9.57E-06	3.99E-07	4.75E-02
200-CW-3	216-N-1	Liquid	9.47E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CW-3	216-N-2	Liquid	7.57E+00	4.27E-04	8.26E-06	2.44E-06	2.31E-04	9.56E-06	3.99E-07	4.74E-02
200-CW-3	216-N-3	Liquid	7.57E+00	4.27E-04	8.26E-06	2.44E-06	2.31E-04	9.56E-06	3.99E-07	4.74E-02
200-CW-3	216-N-4	Liquid	9.47E+02	4.28E-04	8.27E-06	2.45E-06	2.31E-04	9.57E-06	3.99E-07	4.75E-02
200-CW-3	216-N-5	Liquid	7.57E+00	4.27E-04	8.26E-06	2.44E-06	2.31E-04	9.56E-06	3.99E-07	4.74E-02
200-CW-3	216-N-7	Liquid	7.57E+00	4.27E-04	8.26E-06	2.44E-06	2.31E-04	9.56E-06	3.99E-07	4.74E-02
200-CW-5	216-Z-11	Liquid	7.20E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.67E-08	3.81E-10	1.14E-03
200-CW-5	216-Z-19	Liquid	6.16E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-08	1.55E-10	4.65E-04
200-CW-5	216-Z-1D	Liquid	1.97E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-07	1.22E-09	3.64E-03
200-CW-5	216-Z-20	Liquid	4.19E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-07
200-DV-1	216-B-11A&B	Liquid	2.96E+01	1.59E+01	2.77E-04	4.33E-05	4.45E-03	3.13E-04	1.09E-05	3.04E+00
200-DV-1	216-B-35	Liquid	1.06E+00	6.47E+00	8.58E-02	2.82E-02	3.90E+00	3.37E-01	2.82E-03	7.10E+01
200-DV-1	216-B-36	Liquid	1.94E+00	1.18E+01	1.57E-01	5.16E-02	7.14E+00	6.17E-01	5.16E-03	1.30E+02
200-DV-1	216-B-37	Liquid	4.32E+00	2.64E+01	3.50E-01	1.15E-01	1.59E+01	1.37E+00	1.15E-02	2.89E+02
200-DV-1	216-B-38	Liquid	1.43E+00	8.73E+00	1.16E-01	3.81E-02	5.27E+00	4.54E-01	3.81E-03	9.58E+01

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-DV-1	216-B-39	Liquid	1.54E+00	9.40E+00	1.25E-01	4.10E-02	5.67E+00	4.89E-01	4.10E-03	1.03E+02
200-DV-1	216-B-40	Liquid	1.64E+00	1.00E+01	1.33E-01	4.36E-02	6.04E+00	5.21E-01	4.36E-03	1.10E+02
200-DV-1	216-B-41	Liquid	1.44E+00	8.79E+00	1.17E-01	3.83E-02	5.30E+00	4.58E-01	3.83E-03	9.65E+01
200-DV-1	216-B-42	Liquid	1.50E+00	8.48E+00	3.29E-01	5.56E-03	4.86E-01	2.56E-01	1.48E-02	1.82E+02
200-DV-1	216-B-43	Liquid	2.12E+00	1.20E+01	4.65E-01	7.86E-03	6.87E-01	3.61E-01	2.10E-02	2.58E+02
200-DV-1	216-B-44	Liquid	5.60E+00	3.17E+01	1.23E+00	2.08E-02	1.81E+00	9.55E-01	5.54E-02	6.81E+02
200-DV-1	216-B-45	Liquid	4.92E+00	2.78E+01	1.08E+00	1.82E-02	1.59E+00	8.39E-01	4.87E-02	5.98E+02
200-DV-1	216-B-46	Liquid	6.70E+00	3.79E+01	1.47E+00	2.48E-02	2.17E+00	1.14E+00	6.63E-02	8.14E+02
200-DV-1	216-B-47	Liquid	3.68E+00	2.23E+01	8.64E-01	2.50E-02	2.18E+00	6.72E-01	3.90E-02	3.05E+02
200-DV-1	216-B-48	Liquid	4.09E+00	2.31E+01	8.96E-01	1.52E-02	1.33E+00	6.97E-01	4.05E-02	4.97E+02
200-DV-1	216-B-49	Liquid	6.70E+00	3.79E+01	1.47E+00	2.48E-02	2.17E+00	1.14E+00	6.63E-02	8.14E+02
200-DV-1	216-B-5	Liquid	3.21E+01	1.07E-04	1.11E-02	2.91E-03	2.48E-01	5.28E-03	4.98E-04	7.55E+00
200-DV-1	216-B-50	Liquid	5.47E+01	1.26E+02	3.04E-03	1.32E-03	1.27E-01	8.02E-03	2.08E-04	1.52E+00
200-DV-1	216-B-57	Liquid	8.43E+01	1.95E+02	9.11E-03	3.96E-03	3.80E-01	2.40E-02	6.24E-04	3.55E+00
200-DV-1	216-B-7A&B	Liquid	4.46E+01	6.44E-03	2.15E-02	5.36E-02	5.02E+00	3.59E-01	1.15E-03	1.63E+03
200-DV-1	216-B-8	Liquid	3.53E+01	1.32E-02	1.50E-01	3.91E-02	3.36E+00	8.72E-02	6.71E-03	1.46E+02
200-DV-1	216-B-9	Liquid	3.60E+01	1.68E-03	1.10E-02	2.87E-03	2.49E-01	7.58E-03	4.94E-04	1.07E+01
200-DV-1	216-S-13	Liquid	5.00E+00	4.32E+01	1.86E-04	6.31E-05	5.94E-03	1.85E-03	0.00E+00	4.21E-01
200-DV-1	216-S-21	Liquid	8.71E+01	2.54E+03	9.01E-03	1.15E-03	1.09E-01	3.39E-02	5.71E-04	4.96E+00
200-DV-1	216-S-9	Liquid	4.96E+01	1.17E+03	0.00E+00	0.00E+00	0.00E+00	1.12E-02	1.80E-03	1.19E+02
200-DV-1	216-T-14	Liquid	1.01E+00	6.14E+00	8.14E-02	2.68E-02	3.70E+00	3.20E-01	2.68E-03	6.74E+01
200-DV-1	216-T-15	Liquid	1.04E+00	6.36E+00	8.43E-02	2.77E-02	3.84E+00	3.31E-01	2.77E-03	6.98E+01
200-DV-1	216-T-16	Liquid	1.02E+00	6.22E+00	8.25E-02	2.71E-02	3.76E+00	3.24E-01	2.71E-03	6.83E+01
200-DV-1	216-T-17	Liquid	7.85E-01	4.79E+00	6.35E-02	2.09E-02	2.89E+00	2.49E-01	2.09E-03	5.26E+01
200-DV-1	216-T-18	Liquid	1.02E+00	2.30E-01	2.60E-01	1.09E-03	9.79E-02	5.98E-02	2.09E-03	3.67E+00
200-DV-1	216-T-19	Liquid	4.55E+02	5.12E+03	1.53E-02	3.99E-03	3.52E-01	1.41E-02	6.93E-04	2.46E+01
200-DV-1	216-T-21	Liquid	4.63E-01	2.83E+00	3.75E-02	1.23E-02	1.70E+00	1.47E-01	1.23E-03	3.10E+01
200-DV-1	216-T-22	Liquid	1.54E+00	9.40E+00	1.25E-01	4.10E-02	5.67E+00	4.89E-01	4.10E-03	1.03E+02
200-DV-1	216-T-23	Liquid	1.49E+00	9.07E+00	1.20E-01	3.95E-02	5.47E+00	4.72E-01	3.95E-03	9.96E+01
200-DV-1	216-T-24	Liquid	1.54E+00	9.40E+00	1.25E-01	4.10E-02	5.67E+00	4.89E-01	4.10E-03	1.03E+02
200-DV-1	216-T-25	Liquid	2.99E+00	1.82E+01	2.42E-01	7.95E-02	1.10E+01	9.49E-01	7.95E-03	2.00E+02
200-DV-1	216-T-26	Liquid	1.11E+01	2.48E+00	2.81E+00	1.18E-02	1.06E+00	6.46E-01	2.26E-02	3.96E+01

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-DV-1	216-T-3	Liquid	1.13E+01	2.02E-05	4.15E-03	1.08E-03	9.25E-02	1.97E-03	1.85E-04	1.70E+00
200-DV-1	216-T-32	Liquid	2.90E+01	2.18E-04	1.46E-02	3.82E-03	3.33E-01	1.09E-02	6.59E-04	2.52E+00
200-DV-1	216-T-5	Liquid	3.15E+00	8.78E-03	2.77E-02	7.23E-03	6.39E-01	2.54E-02	1.26E-03	2.95E+01
200-DV-1	216-T-6	Liquid	4.50E+01	2.13E-04	1.48E-02	3.88E-03	3.31E-01	7.04E-03	6.63E-04	1.40E+01
200-DV-1	216-T-7	Liquid	1.07E+02	9.17E-02	3.71E-01	9.68E-02	8.50E+00	3.12E-01	1.68E-02	3.67E+02
200-EA-1	200-E-103	Liquid	4.00E-03	1.09E-08	2.49E-10	3.98E-10	3.81E-08	2.01E-09	2.11E-11	2.21E-07
200-EA-1	200-E-25	Liquid	7.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-03
200-EA-1	200-E-4	Liquid	1.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-41	Liquid	2.20E-02	6.49E-08	1.78E-09	4.63E-10	4.39E-08	8.11E-09	1.27E-10	6.87E-06
200-EA-1	200-E-54	Liquid	2.01E-01	5.45E-07	1.25E-08	1.99E-08	1.91E-06	1.01E-07	1.06E-09	1.11E-05
200-EA-1	200-E-56	Liquid	7.55E-02	2.47E-02	1.07E-02	2.20E-01	2.08E+01	1.56E+00	1.32E-03	7.38E+03
200-EA-1	200-E-57	Liquid	1.13E-01	3.71E-02	1.60E-02	3.30E-01	3.12E+01	2.34E+00	1.98E-03	1.11E+04
200-EA-1	200-E-68	Liquid	1.84E-01	0.00E+00	7.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-08
200-EA-1	200-E-82	Liquid	1.88E-01	0.00E+00	7.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.53E-08
200-EA-1	200-E-94	Liquid	2.32E-01	1.47E-06	3.35E-08	9.32E-09	8.82E-07	9.70E-08	2.02E-09	1.60E-04
200-EA-1	200-E-95	Liquid	2.19E-01	4.16E-05	8.05E-07	2.38E-07	2.25E-05	9.32E-07	3.89E-08	9.28E-03
200-EA-1	216-A-1	Liquid	9.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	Liquid	3.16E+03	5.77E+04	1.11E-02	3.83E-03	3.66E-01	7.13E-02	1.57E-03	1.84E+01
200-EA-1	216-A-15	Liquid	1.00E+01	0.00E+00	3.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-06
200-EA-1	216-A-18	Liquid	4.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	Liquid	1.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	Liquid	2.30E-01	1.40E-03	2.21E-03	8.01E-06	7.45E-04	5.38E-03	8.60E-05	8.92E-01
200-EA-1	216-A-20	Liquid	9.61E-01	2.33E+00	3.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.15E-04
200-EA-1	216-A-21	Liquid	7.79E+01	4.95E+01	0.00E+00	0.00E+00	0.00E+00	7.71E-02	1.31E-04	6.06E+00
200-EA-1	216-A-22	Liquid	9.99E-03	7.96E-02	9.12E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.62E-10
200-EA-1	216-A-26	Liquid	3.86E-03	1.05E-08	2.40E-10	3.84E-10	3.68E-08	1.94E-09	2.04E-11	2.14E-07
200-EA-1	216-A-26A	Liquid	1.00E-03	2.72E-09	6.23E-11	9.95E-11	9.53E-09	5.02E-10	5.29E-12	5.54E-08
200-EA-1	216-A-27	Liquid	2.32E+01	5.04E-02	4.86E-04	4.82E-05	4.65E-03	3.27E-03	2.05E-05	2.50E+01
200-EA-1	216-A-28	Liquid	3.00E-02	3.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	Liquid	3.05E+00	4.13E+01	4.04E-07	3.83E-08	3.69E-06	2.72E-06	1.70E-08	2.08E-02
200-EA-1	216-A-30	Liquid	7.64E+03	1.59E-02	2.89E-02	2.18E-05	2.09E-03	1.10E-04	1.16E-06	1.39E-02
200-EA-1	216-A-36A	Liquid	1.07E+00	1.00E+02	0.00E+00	0.00E+00	0.00E+00	1.16E-01	8.52E-03	7.89E+02

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-EA-1	216-A-36B	Liquid	3.15E+02	2.00E+02	0.00E+00	0.00E+00	0.00E+00	1.15E+00	1.10E-03	2.75E+02
200-EA-1	216-A-37-1	Liquid	3.68E+02	5.92E+02	1.50E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-01
200-EA-1	216-A-37-2	Liquid	1.10E+03	9.51E+00	4.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-02
200-EA-1	216-A-4	Liquid	6.21E+00	6.45E+01	8.07E-05	7.65E-06	7.38E-04	5.43E-04	3.39E-06	4.17E+00
200-EA-1	216-A-40	Liquid	9.46E-01	1.40E-07	2.69E-08	5.07E-09	4.82E-07	3.10E-07	3.20E-09	1.74E-07
200-EA-1	216-A-41	Liquid	1.00E-02	1.04E-01	8.92E-09	4.52E-09	4.35E-07	7.18E-08	1.58E-09	7.44E-06
200-EA-1	216-A-45	Liquid	1.03E+02	3.22E+03	3.96E-05	3.57E-05	3.46E-03	6.77E-04	1.98E-05	6.99E-02
200-EA-1	216-A-5	Liquid	1.63E+03	1.71E+04	9.98E-03	2.50E-03	2.33E-01	5.04E-02	9.77E-04	3.03E+01
200-EA-1	216-A-6	Liquid	3.36E+03	1.17E+03	1.32E-02	1.75E-04	1.63E-02	3.46E-03	6.70E-05	2.08E+00
200-EA-1	216-A-9	Liquid	9.81E+02	8.07E+02	1.17E+00	0.00E+00	0.00E+00	2.50E-03	0.00E+00	1.44E-01
200-EA-1	216-B-10A	Liquid	9.98E+00	6.38E-02	2.29E-04	6.78E-05	6.42E-03	2.65E-04	1.11E-05	1.32E+00
200-EA-1	216-B-10B	Liquid	2.80E-02	5.11E-08	1.17E-09	1.87E-09	1.79E-07	9.43E-09	9.92E-11	1.04E-06
200-EA-1	216-B-12	Liquid	5.20E+02	2.34E+03	9.35E-03	1.47E-03	1.51E-01	1.06E-02	3.68E-04	8.19E+01
200-EA-1	216-B-51	Liquid	1.03E-03	6.62E-03	2.57E-04	1.11E-05	9.72E-04	2.00E-04	1.16E-05	2.83E-02
200-EA-1	216-B-55	Liquid	1.20E+03	1.77E-04	3.40E-05	6.42E-06	6.10E-04	3.93E-04	4.05E-06	2.20E-04
200-EA-1	216-B-59	Liquid	4.77E-01	7.05E-08	1.35E-08	2.56E-09	2.43E-07	1.57E-07	1.61E-09	8.76E-08
200-EA-1	216-B-6	Liquid	6.00E+00	7.12E-03	1.38E-04	4.07E-05	3.85E-03	1.59E-04	6.65E-06	7.91E-01
200-EA-1	216-B-62	Liquid	2.80E+02	3.54E-01	6.43E-02	1.84E-02	1.74E+00	6.21E-01	7.70E-03	8.27E+01
200-EA-1	216-B-63	Liquid	7.98E+03	1.30E+02	3.36E-02	4.95E-07	4.71E-05	5.29E-05	3.12E-07	6.91E-01
200-EA-1	216-BY-201	Liquid	4.16E-02	2.35E-01	9.13E-03	1.54E-04	1.35E-02	7.10E-03	4.12E-04	5.06E+00
200-EA-1	216-C-1	Liquid	2.34E+01	1.64E-04	7.08E-05	1.46E-03	1.38E-01	1.03E-02	8.74E-06	4.89E+01
200-EA-1	216-C-10	Liquid	8.97E-01	6.55E-05	2.83E-05	5.84E-04	5.50E-02	4.13E-03	3.50E-06	1.96E+01
200-EA-1	216-C-2	Liquid	3.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.99E-02
200-EA-1	216-C-3	Liquid	5.00E+00	7.92E+01	1.42E-05	2.92E-04	2.75E-02	2.07E-03	1.75E-06	9.77E+00
200-EA-1	216-C-4	Liquid	1.70E-01	1.68E-04	1.22E-05	5.21E-05	4.94E-03	6.69E-04	2.63E-06	7.38E+00
200-EA-1	216-C-5	Liquid	3.89E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	Liquid	5.31E-01	1.25E+01	3.30E-05	1.41E-04	1.33E-02	1.88E-03	1.87E-05	2.07E+01
200-EA-1	216-C-7	Liquid	5.99E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	UPR-200-E-117	Liquid	3.30E-04	3.50E-03	6.36E-04	1.82E-04	1.72E-02	6.14E-03	7.62E-05	8.18E-01
200-EA-1	UPR-200-E-40	Liquid	1.17E-04	1.09E-02	0.00E+00	0.00E+00	0.00E+00	1.27E-05	9.31E-07	8.62E-02
200-EA-1	UPR-200-E-9	Liquid	4.16E-02	2.55E-01	9.89E-03	2.58E-03	2.26E-01	7.69E-03	4.46E-04	1.03E+02
200-IS-1	UPR-200-W-2	Liquid	1.23E-02	1.43E-01	3.80E-03	1.02E-03	8.71E-02	1.85E-03	1.75E-04	3.05E+01

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-IS-1	UPR-200-E-145	Liquid	6.25E-03	1.95E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	Liquid	3.30E-04	2.01E-03	2.67E-05	8.78E-06	1.22E-03	1.05E-04	8.78E-07	2.21E-02
200-IS-1	UPR-200-E-7	Liquid	1.89E-02	1.60E-06	5.35E-06	1.40E-06	1.23E-04	4.91E-06	2.43E-07	5.39E-03
200-IS-1	UPR-200-E-77	Liquid	3.47E-05	4.03E-04	1.07E-05	2.88E-06	2.46E-04	5.22E-06	4.92E-07	8.60E-02
200-IS-1	UPR-200-E-78	Liquid	1.54E-04	5.04E-05	2.18E-05	4.49E-04	4.24E-02	3.18E-03	2.69E-06	1.50E+01
200-IS-1	UPR-200-E-79	Liquid	3.85E-03	1.82E-02	1.07E-03	1.67E-04	1.71E-02	1.20E-03	4.19E-05	8.81E+00
200-IS-1	UPR-200-E-84	Liquid	6.43E-03	6.73E-02	3.94E-08	9.86E-09	9.18E-07	1.99E-07	3.85E-09	1.20E-04
200-IS-1	UPR-200-E-86	Liquid	6.43E-02	7.02E-01	1.41E-01	4.79E-02	4.57E+00	1.28E+00	1.98E-02	1.60E+02
200-IS-1	UPR-200-W-102	Liquid	2.87E-02	4.34E-07	1.79E-05	4.68E-06	4.14E-04	1.65E-05	8.14E-07	3.24E-03
200-IS-1	UPR-200-W-130	Liquid	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-13	1.42E-10
200-IS-1	UPR-200-W-131	Liquid	1.51E-05	9.26E-05	3.59E-06	9.38E-07	8.19E-05	2.79E-06	1.62E-07	3.75E-02
200-IS-1	UPR-200-W-135	Liquid	3.79E-03	9.79E-02	1.63E-03	5.19E-04	4.58E-02	1.82E-03	9.01E-05	9.38E+00
200-IS-1	UPR-200-W-21	Liquid	1.11E-02	2.87E-01	4.78E-03	1.52E-03	1.34E-01	5.34E-03	2.64E-04	2.75E+01
200-IS-1	UPR-200-W-28	Liquid	2.31E-03	1.42E-02	5.49E-04	1.43E-04	1.25E-02	4.27E-04	2.48E-05	5.73E+00
200-IS-1	UPR-200-W-29	Liquid	3.79E-03	2.31E-02	3.06E-04	1.01E-04	1.39E-02	1.20E-03	1.01E-05	2.54E-01
200-IS-1	UPR-200-W-32	Liquid	3.30E-04	7.73E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	Liquid	7.70E-03	1.99E-01	3.32E-03	1.06E-03	9.32E-02	3.71E-03	1.83E-04	1.91E+01
200-IS-1	UPR-200-W-97	Liquid	2.00E-03	5.57E-06	1.76E-05	4.58E-06	4.05E-04	1.61E-05	7.96E-07	1.87E-02
200-IS-1	UPR-200-W-98	Liquid	3.30E-04	3.83E-03	1.02E-04	2.74E-05	2.34E-03	4.97E-05	4.68E-06	8.18E-01
200-OA-1	2101-M-Pond	Liquid	1.11E+03	1.50E-01	3.25E-03	0.00E+00	0.00E+00	9.79E-04	0.00E+00	1.69E-04
200-OA-1	216-S-10P	Liquid	6.73E+03	1.05E+00	2.55E+00	3.33E-04	3.18E-02	1.12E+00	3.05E-05	8.28E-01
200-OA-1	216-S-19	Liquid	1.30E+03	2.30E-01	3.42E-03	0.00E+00	0.00E+00	1.50E-03	0.00E+00	1.63E-04
200-OA-1	216-S-26	Liquid	2.19E+02	3.87E-02	5.77E-04	0.00E+00	0.00E+00	2.52E-04	0.00E+00	2.74E-05
200-OA-1	216-T-1	Liquid	2.75E+02	4.23E-02	6.27E-04	1.34E-05	1.27E-03	5.24E-05	2.19E-06	2.70E+00
200-OA-1	216-W-LWC	Liquid	9.99E+02	4.40E-05	0.00E+00	0.00E+00	0.00E+00	1.23E+00	0.00E+00	1.92E-01
200-PW-1	216-Z-1%2stripped	Liquid	5.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-1&2	Liquid	3.37E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-04	8.31E-08	1.68E-02
200-PW-1	216-Z-12	Liquid	2.72E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.11E-03	3.67E-06	7.05E-01
200-PW-1	216-Z-12stripped	Liquid	2.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-12vit	Liquid	3.47E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.48E-07	2.41E-09	7.19E-03
200-PW-1	216-Z-18	Liquid	3.86E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-03	6.93E-07	6.79E-02
200-PW-1	216-Z-18stripped	Liquid	4.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-PW-1	216-Z-1A	Liquid	6.21E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-03	1.24E-06	9.83E-01
200-PW-1	216-Z-3	Liquid	9.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.70E-05	7.44E-08	1.63E-01
200-PW-1	216-Z-9	Liquid	4.09E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-03	7.31E-07	7.16E-02
200-PW-1	216-Z-9mined	Liquid	2.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-9stripped	Liquid	2.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	241-Z-361	Liquid	2.23E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.52E-04	5.24E-07	3.67E-01
200-PW-3	216-A-24	Liquid	8.21E+02	8.80E+03	3.03E+00	2.47E-06	2.37E-04	1.47E-03	2.75E-05	1.74E+00
200-PW-3	216-A-31	Liquid	3.05E-02	5.53E-04	3.51E-04	2.28E-06	2.19E-04	1.36E-03	2.54E-05	1.27E+00
200-PW-3	216-A-7	Liquid	3.27E-01	2.33E-01	3.15E-03	1.84E-05	1.77E-03	1.10E-02	2.05E-04	1.02E+01
200-PW-3	216-A-8	Liquid	1.15E+03	2.46E+04	3.53E+00	1.48E-05	1.42E-03	8.84E-03	1.65E-04	8.65E+00
200-PW-6	216-Z-10	Liquid	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.78E-04	1.62E-06	4.77E+00
200-PW-6	216-Z-5	Liquid	3.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.92E-04	1.25E-06	3.69E+00
200-PW-6	216-Z-8	Liquid	1.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-07	1.68E-10	1.65E-05
200-PW-6	241-Z-8	Liquid	1.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-07	1.68E-10	1.65E-05
200-SW-2	216-C-9	Liquid	1.04E+03	8.28E-03	2.44E-04	5.02E-06	4.77E-04	3.07E-04	3.17E-06	1.31E+00
200-SW-2	216-T-4A	Liquid	4.28E+04	1.25E+03	1.11E-04	3.28E-05	3.11E-03	1.55E-04	5.35E-06	2.87E+00
200-WA-1	200-W-22	Liquid	3.20E-05	9.01E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	Liquid	1.11E-02	3.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-9	Liquid	1.36E-01	1.61E-04	3.12E-06	9.23E-07	8.74E-05	3.61E-06	1.51E-07	1.79E-02
200-WA-1	200-W-PP	Liquid	3.41E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	Liquid	1.60E+02	2.54E+03	0.00E+00	0.00E+00	0.00E+00	2.02E-02	4.54E-02	9.58E+02
200-WA-1	216-S-12	Liquid	7.48E-02	1.06E-01	1.62E-07	1.23E-07	1.18E-05	3.02E-05	6.61E-05	1.40E+00
200-WA-1	216-S-14	Liquid	7.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	Liquid	1.35E+02	1.53E-01	2.69E+00	1.37E-04	1.33E-02	1.18E+00	6.06E-05	7.45E+01
200-WA-1	216-S-22	Liquid	9.83E-02	2.23E+00	2.04E-09	1.56E-09	1.49E-07	9.79E-09	1.43E-10	3.31E-06
200-WA-1	216-S-23	Liquid	3.41E+01	4.24E-05	7.08E-07	5.40E-07	5.15E-05	3.39E-06	4.95E-08	1.15E-03
200-WA-1	216-S-25	Liquid	2.88E+02	3.62E+03	4.48E-05	0.00E+00	0.00E+00	2.32E-04	0.00E+00	4.85E-05
200-WA-1	216-S-3	Liquid	4.20E+00	1.22E+02	4.06E-04	7.66E-05	7.27E-03	2.26E-03	3.81E-05	3.31E-01
200-WA-1	216-S-4	Liquid	9.99E-01	2.91E+01	0.00E+00	0.00E+00	0.00E+00	8.29E-07	0.00E+00	1.81E-07
200-WA-1	216-S-5	Liquid	4.08E+03	3.33E+00	1.09E-03	1.83E-04	1.69E-02	1.76E-03	5.25E-05	1.79E+00
200-WA-1	216-S-6	Liquid	4.44E+03	3.58E+00	9.23E-05	7.04E-05	6.72E-03	8.27E-04	1.60E-04	5.85E+00
200-WA-1	216-S-7	Liquid	3.90E+02	8.38E+03	0.00E+00	0.00E+00	0.00E+00	9.15E-02	4.32E-02	1.47E+03

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-WA-1	216-S-8	Liquid	1.00E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	Liquid	5.01E+00	7.93E+01	4.05E-04	1.33E-04	1.84E-02	1.59E-03	1.33E-05	3.35E-01
200-WA-1	216-T-2	Liquid	6.01E+00	7.14E-03	1.38E-04	4.08E-05	3.86E-03	1.60E-04	6.66E-06	7.92E-01
200-WA-1	216-T-20	Liquid	1.89E-02	3.03E-01	9.24E-06	1.45E-06	1.49E-04	1.04E-05	3.63E-07	7.63E-02
200-WA-1	216-T-27	Liquid	7.19E+00	8.40E-03	1.10E-01	7.65E-06	7.38E-04	4.84E-02	3.39E-06	4.17E+00
200-WA-1	216-T-28	Liquid	4.23E+01	2.52E-01	7.34E-01	2.30E-04	2.21E-02	3.36E-01	1.02E-04	1.25E+02
200-WA-1	216-T-29	Liquid	7.40E-02	4.57E-05	8.83E-07	2.61E-07	2.47E-05	1.02E-06	4.27E-08	5.07E-03
200-WA-1	216-T-33	Liquid	1.90E+00	7.65E-01	4.34E-08	1.56E-08	1.48E-06	6.47E-08	2.17E-09	2.39E-04
200-WA-1	216-T-34	Liquid	1.73E+01	2.55E-05	8.66E-02	9.34E-07	8.94E-05	3.78E-02	4.96E-08	4.64E-03
200-WA-1	216-T-35	Liquid	5.73E+00	0.00E+00	1.51E-01	0.00E+00	0.00E+00	6.58E-02	0.00E+00	7.15E-03
200-WA-1	216-T-36	Liquid	5.09E-01	9.29E-07	2.13E-08	3.40E-08	3.25E-06	1.72E-07	1.80E-09	1.89E-05
200-WA-1	216-T-8	Liquid	5.00E-01	5.99E-05	1.16E-06	3.42E-07	3.24E-05	1.34E-06	5.59E-08	6.65E-03
200-WA-1	216-U-1&2	Liquid	1.59E+01	1.13E+02	1.12E-04	2.93E-05	2.56E-03	8.77E-05	5.07E-06	1.17E+00
200-WA-1	216-U-12	Liquid	1.49E+02	3.16E+03	7.65E-07	1.48E-05	1.26E-03	5.58E-05	1.30E-04	1.67E+01
200-WA-1	216-U-13	Liquid	1.14E-02	1.35E-05	2.61E-07	7.71E-08	7.30E-06	3.02E-07	1.26E-08	1.50E-03
200-WA-1	216-U-14	Liquid	4.88E+03	9.52E+00	7.77E-03	3.08E-05	2.94E-03	1.98E-01	2.30E-06	7.52E-02
200-WA-1	216-U-15	Liquid	6.81E-02	6.38E-05	1.51E-06	4.29E-07	3.95E-05	1.54E-06	7.14E-08	1.13E-02
200-WA-1	216-U-16	Liquid	4.09E+02	4.18E+03	9.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.72E-08
200-WA-1	216-U-17	Liquid	5.93E+00	1.86E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-3	Liquid	7.91E-01	2.28E+01	0.00E+00	0.00E+00	0.00E+00	6.40E-07	0.00E+00	1.39E-07
200-WA-1	216-U-4	Liquid	3.00E-01	3.56E-04	6.99E-06	2.06E-06	1.95E-04	8.02E-06	3.37E-07	3.95E-02
200-WA-1	216-U-4A	Liquid	5.45E-01	5.69E-07	1.43E-02	3.25E-09	3.08E-07	6.24E-03	5.31E-10	7.42E-04
200-WA-1	216-U-4B	Liquid	3.30E-02	0.00E+00	8.66E-04	0.00E+00	0.00E+00	3.78E-04	0.00E+00	4.12E-05
200-WA-1	216-U-5	Liquid	2.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	Liquid	2.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	Liquid	7.00E-03	1.90E-08	4.36E-10	6.96E-10	6.66E-08	3.51E-09	3.70E-11	3.87E-07
200-WA-1	216-U-8	Liquid	3.75E+02	4.62E+03	6.80E-06	2.75E-06	2.61E-04	1.36E-05	3.62E-07	3.25E-02
200-WA-1	216-Z-13	Liquid	4.98E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.51E-08
200-WA-1	216-Z-14	Liquid	5.18E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-08
200-WA-1	216-Z-15	Liquid	4.81E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-08
200-WA-1	216-Z-16	Liquid	1.02E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.49E-08	4.39E-05
200-WA-1	216-Z-17	Liquid	3.68E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-08	1.58E-05

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
200-WA-1	216-Z-21	Liquid	1.57E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.82E-07
200-WA-1	216-Z-4	Liquid	1.10E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-05	7.76E-08	2.28E-01
200-WA-1	216-Z-6	Liquid	9.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.84E-05	1.65E-07	4.86E-01
200-WA-1	216-Z-7	Liquid	7.99E+01	1.15E-05	2.64E-07	4.22E-07	4.04E-05	1.21E-02	5.19E-05	1.53E+02
200-WA-1	UPR-200-W-101	Liquid	4.50E-03	7.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	Liquid	2.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-138	Liquid	1.49E-02	2.34E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	Liquid	3.35E-02	9.35E-01	3.05E-10	1.27E-10	1.21E-08	6.42E-10	1.64E-11	1.42E-06
200-WA-1	UPR-200-W-19	Liquid	3.85E-05	2.10E-08	8.13E-10	2.12E-10	1.86E-08	6.33E-10	3.67E-11	8.49E-06
200-WA-1	UPR-200-W-20	Liquid	7.70E-04	2.24E-02	0.00E+00	0.00E+00	0.00E+00	6.39E-10	0.00E+00	1.39E-10
200-WA-1	UPR-200-W-33	Liquid	2.31E-06	5.98E-05	9.96E-07	3.17E-07	2.80E-05	1.11E-06	5.50E-08	5.73E-03
200-WA-1	UPR-200-W-39	Liquid	3.85E-04	6.06E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	Liquid	1.54E-03	4.48E-02	0.00E+00	0.00E+00	0.00E+00	1.28E-09	0.00E+00	2.78E-10
200-WA-1	UPR-200-W-95	Liquid	3.97E-05	1.10E-03	5.98E-05	7.04E-06	6.35E-04	8.08E-05	2.77E-06	9.83E-02
WMA-A-AX	216-A-16	Liquid	1.22E-01	3.32E-07	7.60E-09	1.21E-08	1.16E-06	6.12E-08	6.44E-10	6.75E-06
WMA-A-AX	216-A-17	Liquid	6.00E-02	1.63E-07	3.74E-09	5.97E-09	5.71E-07	3.01E-08	3.17E-10	3.32E-06
WMA-A-AX	216-A-23A	Liquid	2.99E-03	1.55E-01	5.63E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.94E-07
WMA-A-AX	216-A-23B	Liquid	2.99E-03	1.49E-01	5.63E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.94E-07
WMA-A-AX	216-A-39	Liquid	2.00E-05	2.36E-04	5.96E-05	2.68E-05	2.58E-03	4.80E-04	1.09E-05	4.96E-02
WMA-A-AX	241-A-103	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	Liquid	3.79E-03	4.34E-02	7.66E-03	2.31E-03	2.19E-01	7.25E-02	9.16E-04	9.65E+00
WMA-A-AX	241-A-105	Liquid	9.50E-01	6.45E-01	1.93E-01	7.63E-02	7.31E+00	1.39E+00	3.08E-02	1.70E+02
WMA-A-AX	241-AX-102	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	Liquid	3.30E-04	3.50E-03	6.36E-04	1.82E-04	1.72E-02	6.14E-03	7.62E-05	8.18E-01
WMA-A-AX	UPR-200-E-119	Liquid	1.02E-07	1.08E-06	1.96E-07	5.61E-08	5.31E-06	1.89E-06	2.35E-08	2.52E-04
WMA-B-BX-BY	200-E-60	Liquid	5.20E-03	9.48E-09	2.17E-10	3.47E-10	3.32E-08	1.75E-09	1.84E-11	1.93E-07
WMA-B-BX-BY	241-B-101	Liquid	3.14E-03	5.75E-02	6.56E-03	4.15E-03	3.96E-01	3.49E-02	4.99E-04	2.05E+02
WMA-B-BX-BY	241-B-105	Liquid	1.36E-01	1.05E+01	1.24E+00	5.40E-01	5.18E+01	3.27E+00	8.50E-02	3.38E+02
WMA-B-BX-BY	241-B-106	Liquid	4.17E-02	6.63E-02	8.13E-03	3.50E-03	3.36E-01	2.50E-02	6.18E-04	4.06E+00
WMA-B-BX-BY	241-B-107	Liquid	2.65E-02	4.32E+00	3.52E-02	1.95E-01	1.87E+01	5.13E-01	5.43E-04	1.96E+01
WMA-B-BX-BY	241-B-110**	Liquid	3.79E-02	1.29E+00	1.81E-01	6.76E-02	6.48E+00	9.02E-01	1.84E-02	9.32E+01
WMA-B-BX-BY	241-B-112	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
WMA-B-BX-BY	241-B-201	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	Liquid	1.70E-03	1.00E-02	1.66E-03	9.61E-04	9.12E-02	1.83E-02	2.13E-04	9.76E+01
WMA-B-BX-BY	241-BX-102*	Liquid	4.72E-01	1.84E+01	4.24E-01	6.99E-01	6.67E+01	2.19E+00	2.11E-02	1.98E+03
WMA-B-BX-BY	241-BX-108	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	Liquid	1.04E-02	7.15E-01	8.42E-02	3.66E-02	3.51E+00	2.22E-01	5.77E-03	2.29E+01
WMA-B-BX-BY	241-BY-107	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	Liquid	8.71E-02	5.31E-01	7.04E-03	2.32E-03	3.21E-01	2.77E-02	2.32E-04	5.83E+00
WMA-B-BX-BY	UPR-200-E-108	Liquid	7.42E-04	1.92E-02	3.20E-04	1.02E-04	8.99E-03	3.58E-04	1.77E-05	1.84E+00
WMA-B-BX-BY	UPR-200-E-109	Liquid	5.68E-04	3.48E-03	1.35E-04	3.52E-05	3.08E-03	1.05E-04	6.09E-06	1.41E+00
WMA-B-BX-BY	UPR-200-E-110	Liquid	1.93E-02	1.17E-01	1.56E-03	5.12E-04	7.09E-02	6.12E-03	5.12E-05	1.29E+00
WMA-B-BX-BY	UPR-200-E-38	Liquid	2.04E-02	4.02E-01	7.75E-02	1.43E-02	1.36E+00	4.90E-01	9.22E-03	5.07E+01
WMA-B-BX-BY	UPR-200-E-6	Liquid	3.85E-03	2.35E-02	3.12E-04	1.02E-04	1.42E-02	1.22E-03	1.02E-05	2.58E-01
WMA-B-BX-BY	UPR-200-E-73	Liquid	3.47E-04	8.98E-03	1.50E-04	4.76E-05	4.20E-03	1.67E-04	8.26E-06	8.60E-01
WMA-B-BX-BY	UPR-200-E-74	Liquid	3.85E-05	4.57E-08	8.84E-10	2.61E-10	2.47E-08	1.02E-09	4.27E-11	5.07E-06
WMA-B-BX-BY	UPR-200-E-75	Liquid	3.85E-03	2.35E-02	3.12E-04	1.02E-04	1.42E-02	1.22E-03	1.02E-05	2.58E-01
WMA-C	216-C-8	Liquid	1.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.54E-04
WMA-C	241-C-101	Liquid	7.00E-02	1.20E-02	2.60E-03	9.92E-04	9.36E-02	1.35E-02	2.44E-04	2.63E+00
WMA-C	241-C-104	Liquid	5.30E-02	4.13E+00	3.92E-02	1.59E-01	1.48E+01	3.04E-01	2.88E-05	1.74E+01
WMA-C	241-C-105	Liquid	5.95E-02	1.62E+00	2.83E-01	1.26E-01	1.20E+01	1.85E+00	3.20E-02	2.99E+02
WMA-C	241-C-108	Liquid	3.41E-02	7.82E-01	1.14E-02	1.11E-01	1.04E+01	6.35E-01	5.01E-04	2.74E+03
WMA-C	241-C-110	Liquid	3.79E-03	1.95E-02	7.47E-04	1.93E-04	1.73E-02	5.97E-04	3.28E-05	7.49E+00
WMA-C	241-C-111	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	Liquid	1.32E-02	9.54E-05	4.13E-05	8.51E-04	8.02E-02	6.02E-03	5.10E-06	2.85E+01
WMA-C	241-C-201	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	Liquid	1.89E-05	1.16E-04	4.49E-06	1.17E-06	1.03E-04	3.50E-06	2.03E-07	4.69E-02
WMA-C	UPR-200-E-16	Liquid	1.89E-04	3.16E-02	2.98E-04	1.21E-03	1.13E-01	2.32E-03	1.23E-07	1.21E-01

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
WMA-C	UPR-200-E-81	Liquid	1.36E-01	2.29E+01	1.46E-01	1.07E+00	1.03E+02	2.82E+00	6.59E-05	7.34E+01
WMA-C	UPR-200-E-82	Liquid	1.08E-02	1.55E-01	3.50E-02	1.22E-02	1.17E+00	2.59E-01	5.54E-03	2.67E+01
WMA-S-SX	241-S-104	Liquid	4.54E-02	1.81E+01	1.23E-01	8.98E-01	8.60E+01	1.55E+00	6.55E-05	7.26E+01
WMA-S-SX	241-SX-104	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	Liquid	2.27E-02	4.66E+00	6.28E-02	1.58E-02	1.47E+00	3.92E-01	7.03E-03	1.25E+02
WMA-S-SX	241-SX-108	Liquid	2.84E-01	1.95E+01	4.03E-01	7.48E-02	6.91E+00	1.61E+00	3.31E-02	7.39E+02
WMA-S-SX	241-SX-109	Liquid	1.89E-03	4.79E-01	7.18E-03	1.63E-03	1.52E-01	4.02E-02	7.47E-04	1.40E+01
WMA-S-SX	241-SX-110	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	Liquid	5.30E-03	1.57E-01	1.96E-02	5.06E-03	4.82E-01	1.27E-01	2.30E-03	2.55E+01
WMA-S-SX	241-SX-112	Liquid	5.11E-02	4.99E+00	2.05E-01	3.87E-02	3.67E+00	1.14E+00	1.92E-02	1.67E+02
WMA-S-SX	241-SX-113	Liquid	2.84E-02	9.37E-01	5.12E-02	6.02E-03	5.43E-01	6.91E-02	2.37E-03	8.41E+01
WMA-S-SX	241-SX-114	Liquid	3.79E-03	5.13E-01	6.00E-03	1.63E-03	1.53E-01	4.45E-02	7.70E-04	1.22E+01
WMA-S-SX	241-XS-115	Liquid	1.14E-01	2.56E+01	2.04E-01	9.92E-01	9.50E+01	2.18E+00	8.07E-03	2.08E+02
WMA-S-SX	316-4	Liquid	1.00E-02	2.91E-01	0.00E+00	0.00E+00	0.00E+00	8.30E-09	0.00E+00	1.81E-09
WMA-T	241-T-101	Liquid	5.00E-01	9.05E+01	8.64E-01	3.11E+00	2.98E+02	7.33E+00	1.21E-02	4.63E+02
WMA-T	241-T-102	Liquid	1.04E-03	3.02E-02	1.13E-03	1.24E-03	1.19E-01	1.17E-02	1.24E-04	4.65E+01
WMA-T	241-T-103	Liquid	2.46E-03	9.40E-02	6.19E-03	3.14E-03	3.00E-01	4.39E-02	6.97E-04	3.38E+01
WMA-T	241-T-106	Liquid	4.15E-01	1.63E+01	1.12E+00	5.74E-01	5.48E+01	7.65E+00	1.23E-01	6.30E+03
WMA-T	241-T-108	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	Liquid	3.97E-03	1.67E-05	5.27E-05	1.37E-05	1.21E-03	4.83E-05	2.39E-06	5.61E-02
WMA-TX-TY	241-TX-104	Liquid	4.73E-02	1.72E-01	4.58E-03	1.23E-03	1.05E-01	2.23E-03	2.10E-04	3.68E+01
WMA-TX-TY	241-TX-105	Liquid	3.29E-01	4.85E+00	1.11E-01	3.14E-02	2.70E+00	7.31E-02	5.39E-03	8.24E+02
WMA-TX-TY	241-TX-114	Liquid	1.32E-02	4.94E-01	6.58E-02	1.64E-02	1.57E+00	3.17E-01	5.85E-03	3.28E+01
WMA-TX-TY	241-TX-118	Liquid	3.31E-03	1.23E-01	1.64E-02	4.09E-03	3.92E-01	7.93E-02	1.46E-03	8.19E+00
WMA-TX-TY	241-TY-104	Liquid	2.65E-03	9.88E-02	1.32E-02	3.27E-03	3.13E-01	6.35E-02	1.17E-03	6.56E+00
WMA-TX-TY	241-TY-105	Liquid	1.38E-01	9.55E-01	3.70E-02	9.67E-03	8.45E-01	2.88E-02	1.67E-03	3.87E+02
WMA-TX-TY	241-TX-107	Liquid	2.46E-03	9.17E-02	1.22E-02	3.02E-03	2.89E-01	5.86E-02	1.08E-03	6.10E+00
WMA-TX-TY	241-TY-101	Liquid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	Liquid	6.81E-03	2.54E-01	3.39E-02	8.43E-03	8.07E-01	1.63E-01	3.01E-03	1.69E+01
WMA-TX-TY	241-TY-106	Liquid	3.41E-02	1.97E-01	7.63E-03	1.99E-03	1.74E-01	5.93E-03	3.44E-04	7.96E+01
WMA-TX-TY	UPR-200-W-100	Liquid	9.63E-03	5.87E-02	7.79E-04	2.56E-04	3.54E-02	3.06E-03	2.56E-05	6.45E-01

OPU Name	WIDS-Site-Name	Waste Form	Volume Mean [ML]	Hydrogen 3 [Ci]	Carbon 14 [Ci]	Nickel 59 [Ci]	Nickel 63 [Ci]	Cobalt 60 [Ci]	Selenium 79 [Ci]	Strontium 90 [Ci]
WMA-TX-TY	UPR-200-W-12	Liquid	1.89E-05	8.93E-05	5.24E-06	8.20E-07	8.43E-05	5.92E-06	2.06E-07	4.33E-02
WMA-TX-TY	UPR-200-W-127	Liquid	3.30E-04	9.60E-03	0.00E+00	0.00E+00	0.00E+00	2.74E-10	0.00E+00	5.97E-11
WMA-U	241-U-101	Liquid	5.68E-02	1.62E+00	8.82E-02	1.04E-02	9.36E-01	1.19E-01	4.08E-03	1.45E+02
WMA-U	241-U-104	Liquid	2.06E-01	8.58E-01	2.29E-02	6.14E-03	5.24E-01	1.11E-02	1.05E-03	1.83E+02
WMA-U	241-U-110	Liquid	5.68E-02	1.01E+00	4.09E-02	1.79E-02	1.73E+00	1.99E-01	2.87E-03	2.07E+01
WMA-U	241-U-112	Liquid	2.17E-01	7.53E+00	3.34E-01	5.97E-02	5.58E+00	5.26E-01	1.46E-02	5.42E+02
WMA-U	UPR-200-W-132	Liquid	1.89E-03	4.90E-02	8.16E-04	2.59E-04	2.29E-02	9.12E-04	4.51E-05	4.69E+00
WMA-U	UPR-200-W-24	Liquid	1.37E-04	1.59E-03	4.25E-05	1.14E-05	9.74E-04	2.07E-05	1.95E-06	3.41E-01
* Scaled for UNH solubility of the 1951 overflow event										
** matched leak volume bounds										

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-BC-1	216-B-14	5.61E+02	2.54E-02	2.25E-02	3.30E+01	2.80E-11	2.84E+00	8.45E-02
200-BC-1	216-B-15	1.79E+02	1.97E-02	1.74E-02	2.55E+01	2.17E-11	2.20E+00	6.53E-02
200-BC-1	216-B-16	1.46E+02	4.42E-01	3.94E-01	2.01E+01	2.71E-10	1.79E+00	5.21E-02
200-BC-1	216-B-17	7.26E+01	8.67E-01	7.72E-01	8.62E+00	5.20E-10	8.69E-01	2.36E-02
200-BC-1	216-B-18	2.41E+02	2.65E-02	2.34E-02	3.44E+01	2.92E-11	2.96E+00	8.81E-02
200-BC-1	216-B-19	1.49E+02	1.13E+00	1.00E+00	1.90E+01	6.80E-10	1.80E+00	5.05E-02
200-BC-1	216-B-20	1.12E+02	7.31E-01	6.51E-01	1.46E+01	4.41E-10	1.36E+00	3.86E-02
200-BC-1	216-B-21	1.27E+02	1.83E-01	1.63E-01	1.78E+01	1.16E-10	1.56E+00	4.60E-02
200-BC-1	216-B-22	1.21E+02	4.77E-01	4.25E-01	1.64E+01	2.91E-10	1.48E+00	4.27E-02
200-BC-1	216-B-23	1.15E+02	4.66E-01	4.15E-01	1.55E+01	2.84E-10	1.41E+00	4.06E-02
200-BC-1	216-B-24	1.38E+02	1.52E-02	1.34E-02	1.97E+01	1.67E-11	1.69E+00	5.03E-02
200-BC-1	216-B-25	1.39E+02	1.53E-02	1.35E-02	1.98E+01	1.68E-11	1.71E+00	5.08E-02
200-BC-1	216-B-26	1.34E+02	1.48E-02	1.31E-02	1.92E+01	1.63E-11	1.65E+00	4.91E-02
200-BC-1	216-B-27	1.25E+02	1.38E-02	1.22E-02	1.78E+01	1.52E-11	1.54E+00	4.57E-02
200-BC-1	216-B-28	1.31E+02	4.50E-01	4.01E-01	1.78E+01	2.75E-10	1.60E+00	4.63E-02
200-BC-1	216-B-29	2.41E+02	1.45E-02	1.28E-02	1.88E+01	1.60E-11	1.62E+00	4.82E-02
200-BC-1	216-B-30	1.11E+02	8.92E-01	7.94E-01	1.40E+01	5.37E-10	1.34E+00	3.75E-02
200-BC-1	216-B-31	1.13E+02	8.92E-01	7.94E-01	1.43E+01	5.37E-10	1.36E+00	3.82E-02
200-BC-1	216-B-32	1.38E+02	9.27E-01	8.25E-01	1.35E+01	5.58E-10	1.30E+00	3.63E-02
200-BC-1	216-B-33	1.51E+02	1.08E+00	9.64E-01	1.25E+01	6.50E-10	1.23E+00	3.38E-02
200-BC-1	216-B-34	1.47E+02	1.13E+00	1.01E+00	1.27E+01	6.80E-10	1.26E+00	3.45E-02
200-BC-1	216-B-52	3.46E+02	1.76E+00	1.56E+00	2.31E+01	1.06E-09	2.24E+00	6.21E-02
200-BC-1	216-B-53A	8.96E+00	4.32E-04	3.24E-04	3.09E-03	6.20E-06	6.41E-04	5.68E-04
200-BC-1	216-B-53B	5.21E+00	2.51E-04	1.89E-04	1.80E-03	1.99E-07	3.73E-04	3.30E-04
200-BC-1	216-B-54	5.21E+00	2.51E-04	1.89E-04	1.80E-03	1.13E-05	3.73E-04	3.30E-04
200-BC-1	216-B-58	4.17E+00	2.01E-04	1.51E-04	1.44E-03	4.72E-06	2.98E-04	2.64E-04
200-CB-1	200-E-100	1.60E-04	1.06E-07	9.09E-08	8.13E-07	6.21E-14	8.57E-08	1.14E-08
200-CB-1	200-E-28	1.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CB-1	200-E-55	9.51E-03	1.85E-06	1.64E-06	1.68E-05	1.42E-15	1.22E-06	3.56E-08
200-CB-1	200-E-85	7.89E-05	4.48E-07	3.57E-07	2.37E-06	8.03E-08	4.86E-07	6.66E-07
200-CB-1	200-E-88	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-CB-1	200-E-89	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-CB-1	200-E-90	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-CB-1	200-E-91	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-CB-1	200-E-92	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-CB-1	200-E-93	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-CB-1	200-E-97	9.62E-03	1.89E-06	1.67E-06	1.72E-05	1.45E-15	1.25E-06	3.64E-08
200-CB-1	200-E-98	7.98E-03	1.57E-06	1.39E-06	1.43E-05	1.21E-15	1.04E-06	3.03E-08
200-CB-1	200-E-99	1.60E-04	1.06E-07	9.09E-08	8.13E-07	6.21E-14	8.57E-08	1.14E-08
200-CB-1	216-B-13	1.09E-03	2.83E-07	2.51E-07	2.57E-06	2.17E-16	1.87E-07	5.45E-09
200-CB-1	216-B-4	1.32E-03	5.39E-07	4.78E-07	4.90E-06	4.14E-16	3.56E-07	1.04E-08
200-CB-1	216-B-60	7.02E-07	3.98E-09	3.17E-09	2.11E-08	7.14E-10	4.33E-09	5.90E-09
200-CB-1	UPR-200-E-1	5.55E+00	1.95E-02	1.76E-02	3.13E-03	8.82E-13	1.74E-03	2.77E-05
200-CB-1	UPR-200-E-80	9.55E-02	1.55E-07	1.39E-07	2.64E-04	1.13E-17	1.29E-05	1.68E-07
200-CB-1	UPR-200-E-85	6.14E+00	6.66E-02	5.38E-02	3.56E-01	1.01E-07	6.96E-02	1.64E-02
200-CB-1	UPR-200-E-87	1.79E-03	0.00E+00	0.00E+00	1.01E-06	2.37E-14	1.17E-05	1.53E-07
200-CP-1	200-E-107	1.49E-07	8.43E-10	6.71E-10	4.47E-09	1.51E-10	9.16E-10	1.26E-09
200-CP-1	200-E-62	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-63	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-64	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-65	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-67	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-69	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-70	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-71	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-72	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-73	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-74	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-75	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-76	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-77	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-78	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-79	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-80	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-CP-1	200-E-81	2.52E-05	1.43E-07	1.14E-07	7.59E-07	2.57E-08	1.56E-07	2.13E-07
200-CP-1	200-E-84	6.09E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-11	2.40E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-12	2.40E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-13	5.54E-07	3.14E-09	2.50E-09	1.67E-08	5.64E-10	3.41E-09	4.66E-09
200-CP-1	216-A-14	5.53E-08	3.14E-10	2.50E-10	1.66E-09	5.63E-11	3.41E-10	4.65E-10
200-CP-1	216-A-32	2.22E-07	1.26E-09	1.00E-09	6.67E-09	2.26E-10	1.37E-09	1.86E-09
200-CP-1	216-A-35	5.53E-07	3.14E-09	2.50E-09	1.67E-08	5.63E-10	3.41E-09	4.65E-09
200-CP-1	UPR-200-E-39	1.12E+00	1.56E-04	0.00E+00	6.94E-04	3.41E-10	4.03E-08	5.51E-20
200-CR-1	UPR-200-W-61	2.06E+00	3.47E-03	2.99E-03	2.20E-02	4.63E-11	2.39E-03	1.48E-04
200-CR-1	UPR-200-W-96	3.99E-06	1.03E-08	8.55E-09	6.50E-08	1.76E-14	9.45E-09	1.72E-09
200-CW-1	216-A-25	2.90E+01	3.25E-01	2.56E-01	1.71E+00	5.14E-07	3.75E-01	8.78E-02
200-CW-1	216-B-3	1.34E+02	4.42E-02	3.73E-02	3.20E-01	2.59E-05	3.86E-02	6.68E-03
200-CW-1	216-S-16P	1.37E+00	3.75E-03	3.10E-03	2.88E-02	6.72E-09	3.24E-03	5.90E-04
200-CW-1	216-S-17	2.66E+00	4.65E-03	3.99E-03	2.96E-02	8.57E-10	3.31E-03	2.57E-04
200-CW-1	216-U-10	1.95E+00	3.56E-03	2.91E-03	2.13E-02	1.99E-04	3.45E-03	2.07E-03
200-CW-3	216-N-6	4.75E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.74E-07
200-CW-3	216-N-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CW-3	216-N-2	4.74E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.73E-07
200-CW-3	216-N-3	4.74E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.73E-07
200-CW-3	216-N-4	4.75E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.74E-07
200-CW-3	216-N-5	4.74E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.73E-07
200-CW-3	216-N-7	4.74E-02	1.94E-05	1.72E-05	1.76E-04	1.49E-14	1.28E-05	3.73E-07
200-CW-5	216-Z-11	1.14E-03	4.93E-09	0.00E+00	2.19E-08	7.59E-14	1.30E-12	0.00E+00
200-CW-5	216-Z-19	4.65E-04	2.01E-09	0.00E+00	8.93E-09	3.09E-14	5.28E-13	0.00E+00
200-CW-5	216-Z-1D	3.64E-03	1.57E-08	0.00E+00	7.01E-08	2.41E-13	4.15E-12	0.00E+00
200-CW-5	216-Z-20	1.94E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-DV-1	216-B-11A&B	3.04E+00	9.97E-04	8.89E-04	3.25E-03	4.31E-13	3.65E-04	1.01E-05
200-DV-1	216-B-35	7.10E+01	1.31E+00	1.15E+00	2.15E-01	1.40E-09	1.71E-01	4.92E-03
200-DV-1	216-B-36	1.30E+02	2.39E+00	2.11E+00	3.93E-01	2.56E-09	3.13E-01	9.01E-03
200-DV-1	216-B-37	2.90E+02	5.33E+00	4.69E+00	8.74E-01	5.70E-09	6.97E-01	2.01E-02
200-DV-1	216-B-38	9.58E+01	1.77E+00	1.55E+00	2.89E-01	1.89E-09	2.31E-01	6.64E-03

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-DV-1	216-B-39	1.03E+02	1.90E+00	1.67E+00	3.12E-01	2.03E-09	2.48E-01	7.15E-03
200-DV-1	216-B-40	1.10E+02	2.02E+00	1.78E+00	3.32E-01	2.16E-09	2.65E-01	7.61E-03
200-DV-1	216-B-41	9.65E+01	1.78E+00	1.56E+00	2.91E-01	1.90E-09	2.32E-01	6.69E-03
200-DV-1	216-B-42	1.82E+02	3.99E-03	3.52E-03	5.17E+00	4.39E-12	4.45E-01	1.32E-02
200-DV-1	216-B-43	2.58E+02	5.63E-03	4.98E-03	7.30E+00	6.20E-12	6.30E-01	1.87E-02
200-DV-1	216-B-44	6.81E+02	1.49E-02	1.32E-02	1.93E+01	1.64E-11	1.66E+00	4.94E-02
200-DV-1	216-B-45	5.98E+02	1.31E-02	1.16E-02	1.70E+01	1.44E-11	1.46E+00	4.34E-02
200-DV-1	216-B-46	8.14E+02	1.78E-02	1.57E-02	2.31E+01	1.96E-11	1.99E+00	5.91E-02
200-DV-1	216-B-47	3.05E+02	1.05E-02	9.26E-03	1.36E+01	1.15E-11	1.17E+00	3.48E-02
200-DV-1	216-B-48	4.97E+02	1.09E-02	9.61E-03	1.41E+01	1.20E-11	1.21E+00	3.61E-02
200-DV-1	216-B-49	8.14E+02	1.78E-02	1.57E-02	2.31E+01	1.96E-11	1.99E+00	5.91E-02
200-DV-1	216-B-5	7.56E+00	1.99E-01	1.79E-01	4.25E-03	1.44E-11	1.17E-02	1.53E-04
200-DV-1	216-B-50	1.52E+00	1.23E-02	9.91E-03	6.59E-02	1.12E-11	1.54E-02	9.41E-05
200-DV-1	216-B-57	3.55E+00	3.69E-02	2.97E-02	1.98E-01	3.37E-11	4.61E-02	2.82E-04
200-DV-1	216-B-7A&B	1.64E+03	1.17E-01	1.02E-01	9.46E-02	7.20E-07	4.27E-02	7.69E-02
200-DV-1	216-B-8	1.46E+02	4.07E+00	3.64E+00	8.01E-02	1.38E-09	1.74E-01	3.48E-03
200-DV-1	216-B-9	1.07E+01	2.89E-01	2.57E-01	5.75E-03	2.09E-10	1.39E-02	3.59E-04
200-DV-1	216-S-13	4.21E-01	6.47E-02	5.24E-02	4.40E-01	1.93E-07	0.00E+00	0.00E+00
200-DV-1	216-S-21	4.96E+00	3.41E-02	2.80E-02	2.12E-01	6.88E-08	3.16E-02	6.60E-03
200-DV-1	216-S-9	1.19E+02	2.33E-02	0.00E+00	1.04E-01	2.89E-10	4.07E-06	1.23E-18
200-DV-1	216-T-14	6.74E+01	1.24E+00	1.09E+00	2.04E-01	1.33E-09	1.62E-01	4.67E-03
200-DV-1	216-T-15	6.98E+01	1.29E+00	1.13E+00	2.11E-01	1.37E-09	1.68E-01	4.84E-03
200-DV-1	216-T-16	6.84E+01	1.26E+00	1.11E+00	2.06E-01	1.35E-09	1.65E-01	4.74E-03
200-DV-1	216-T-17	5.26E+01	9.69E-01	8.52E-01	1.59E-01	1.04E-09	1.27E-01	3.64E-03
200-DV-1	216-T-18	3.67E+00	8.39E-02	7.22E-02	1.50E-01	5.44E-09	7.15E-02	4.16E-03
200-DV-1	216-T-19	2.46E+01	3.94E-01	3.46E-01	7.91E-03	5.73E-10	2.29E-02	8.02E-04
200-DV-1	216-T-21	3.10E+01	5.71E-01	5.03E-01	9.37E-02	6.11E-10	7.47E-02	2.15E-03
200-DV-1	216-T-22	1.03E+02	1.90E+00	1.67E+00	3.12E-01	2.03E-09	2.48E-01	7.15E-03
200-DV-1	216-T-23	9.96E+01	1.83E+00	1.61E+00	3.01E-01	1.96E-09	2.40E-01	6.90E-03
200-DV-1	216-T-24	1.03E+02	1.90E+00	1.67E+00	3.12E-01	2.03E-09	2.48E-01	7.15E-03
200-DV-1	216-T-25	2.00E+02	3.69E+00	3.24E+00	6.05E-01	3.94E-09	4.82E-01	1.39E-02
200-DV-1	216-T-26	3.96E+01	9.06E-01	7.80E-01	1.62E+00	5.88E-08	7.72E-01	4.49E-02

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-DV-1	216-T-3	1.70E+00	3.57E-02	3.22E-02	9.58E-04	7.14E-12	4.36E-03	5.70E-05
200-DV-1	216-T-32	2.53E+00	0.00E+00	0.00E+00	1.33E-03	7.85E-10	1.93E-02	5.46E-04
200-DV-1	216-T-5	2.95E+01	7.56E-01	6.62E-01	1.50E-02	9.59E-10	4.14E-02	1.45E-03
200-DV-1	216-T-6	1.40E+01	4.01E-01	3.61E-01	7.87E-03	1.28E-11	1.56E-02	2.04E-04
200-DV-1	216-T-7	3.67E+02	9.48E+00	8.35E+00	1.90E-01	1.19E-08	5.26E-01	1.70E-02
200-EA-1	200-E-103	2.21E-07	1.26E-09	1.00E-09	6.66E-09	2.25E-10	1.36E-09	1.86E-09
200-EA-1	200-E-25	1.87E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-41	6.87E-06	6.94E-09	5.82E-09	4.76E-08	6.31E-15	6.17E-09	1.08E-09
200-EA-1	200-E-54	1.11E-05	6.30E-08	5.02E-08	3.34E-07	1.13E-08	6.84E-08	9.44E-08
200-EA-1	200-E-56	7.38E+03	7.86E-02	6.39E-02	4.13E-01	3.07E-06	7.91E-02	3.45E-01
200-EA-1	200-E-57	1.11E+04	1.18E-01	9.58E-02	6.20E-01	4.60E-06	1.19E-01	5.18E-01
200-EA-1	200-E-68	4.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-82	4.53E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-94	1.60E-04	1.05E-07	9.02E-08	8.09E-07	6.07E-14	8.48E-08	1.12E-08
200-EA-1	200-E-95	9.29E-03	1.89E-06	1.67E-06	1.72E-05	1.45E-15	1.25E-06	3.64E-08
200-EA-1	216-A-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	1.84E+01	9.36E-02	7.32E-02	4.89E-01	2.23E-02	1.00E-01	1.75E-01
200-EA-1	216-A-15	2.40E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	8.92E-01	1.49E-01	3.42E-02	2.70E-02	1.35E-09	3.64E-02	5.38E-03
200-EA-1	216-A-20	4.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-21	6.06E+00	1.69E-03	0.00E+00	7.53E-03	2.99E-09	3.71E-07	0.00E+00
200-EA-1	216-A-22	5.62E-10	0.00E+00	0.00E+00	4.89E-04	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-26	2.14E-07	1.21E-09	9.66E-10	6.43E-09	2.17E-10	1.32E-09	1.80E-09
200-EA-1	216-A-26A	5.54E-08	3.14E-10	2.50E-10	1.67E-09	5.64E-11	3.41E-10	4.66E-10
200-EA-1	216-A-27	2.50E+01	1.21E-03	9.11E-04	8.67E-03	1.44E-06	1.80E-03	1.60E-03
200-EA-1	216-A-28	0.00E+00	0.00E+00	0.00E+00	2.61E-03	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	2.08E-02	1.01E-06	7.54E-07	2.73E-01	1.11E-10	1.49E-06	1.32E-06
200-EA-1	216-A-30	1.39E-02	6.88E-05	5.48E-05	3.65E-04	1.23E-05	7.47E-05	1.02E-04
200-EA-1	216-A-36A	7.89E+02	1.10E-01	0.00E+00	4.89E-01	2.40E-07	2.84E-05	3.88E-17

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-EA-1	216-A-36B	2.75E+02	1.43E-02	0.00E+00	6.32E-02	6.70E-03	4.22E-06	1.35E-17
200-EA-1	216-A-37-1	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-37-2	5.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-4	4.17E+00	2.01E-04	1.51E-04	5.72E-01	2.22E-08	2.98E-04	2.64E-04
200-EA-1	216-A-40	1.74E-07	1.91E-07	1.54E-07	1.02E-06	2.91E-13	1.99E-07	4.74E-08
200-EA-1	216-A-41	7.45E-06	9.41E-08	7.42E-08	4.94E-07	4.03E-10	1.09E-07	2.82E-08
200-EA-1	216-A-45	6.99E-02	1.20E-03	6.59E-04	5.85E-03	3.68E-03	1.21E-03	2.56E-02
200-EA-1	216-A-5	3.03E+01	5.82E-02	4.84E-02	3.07E-01	1.55E-08	5.15E-02	7.62E-03
200-EA-1	216-A-6	2.08E+00	3.99E-03	3.32E-03	2.10E-02	2.37E-06	3.53E-03	5.39E-04
200-EA-1	216-A-9	1.44E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-B-10A	1.32E+00	5.38E-04	4.77E-04	5.35E-03	4.13E-13	3.55E-04	1.04E-05
200-EA-1	216-B-10B	1.04E-06	5.90E-09	4.70E-09	3.13E-08	1.06E-09	6.41E-09	8.74E-09
200-EA-1	216-B-12	8.19E+01	3.37E-02	3.00E-02	1.65E+00	6.01E-11	1.24E-02	3.49E-04
200-EA-1	216-B-51	2.83E-02	3.11E-06	2.75E-06	4.04E-03	3.43E-15	3.48E-04	1.03E-05
200-EA-1	216-B-55	2.20E-04	2.41E-04	1.95E-04	1.29E-03	3.68E-10	2.52E-04	6.00E-05
200-EA-1	216-B-59	8.76E-08	9.61E-08	7.76E-08	5.15E-07	1.47E-13	1.01E-07	2.39E-08
200-EA-1	216-B-6	7.91E-01	3.23E-04	2.86E-04	2.94E-03	2.48E-13	2.13E-04	6.22E-06
200-EA-1	216-B-62	8.27E+01	4.59E-01	3.72E-01	2.41E+00	1.70E-06	4.68E-01	1.41E-01
200-EA-1	216-B-63	6.91E-01	1.86E-05	1.50E-05	1.65E-02	2.84E-11	1.95E-05	4.63E-06
200-EA-1	216-BY-201	5.06E+00	1.11E-04	9.78E-05	1.43E-01	1.22E-13	1.24E-02	3.67E-04
200-EA-1	216-C-1	4.89E+01	5.21E-04	4.23E-04	2.74E-03	2.08E-08	5.24E-04	2.29E-03
200-EA-1	216-C-10	1.96E+01	2.08E-04	1.69E-04	1.10E-03	8.12E-09	2.09E-04	9.15E-04
200-EA-1	216-C-2	7.99E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-3	9.77E+00	1.04E-04	8.46E-05	6.96E-04	4.06E-09	1.05E-04	4.57E-04
200-EA-1	216-C-4	7.38E+00	1.56E-04	1.18E-04	8.06E-04	4.06E-09	2.25E-04	2.49E-04
200-EA-1	216-C-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	2.07E+01	5.72E-04	3.19E-04	2.84E-03	1.10E-08	6.06E-04	6.72E-04
200-EA-1	216-C-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	UPR-200-E-117	8.19E-01	4.54E-03	3.68E-03	2.39E-02	1.68E-08	4.64E-03	1.40E-03
200-EA-1	UPR-200-E-40	8.62E-02	1.20E-05	0.00E+00	5.34E-05	2.62E-11	3.10E-09	4.24E-21
200-EA-1	UPR-200-E-9	1.03E+02	1.20E-04	1.06E-04	1.55E-01	1.32E-13	1.34E-02	3.98E-04
200-IS-1	UPR-200-W-2	3.05E+01	4.73E-05	4.25E-05	8.44E-02	1.85E-15	4.10E-03	5.37E-05

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-IS-1	UPR-200-E-145	0.00E+00	0.00E+00	0.00E+00	8.31E-04	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	2.21E-02	4.07E-04	3.58E-04	6.68E-05	4.35E-13	5.32E-05	1.53E-06
200-IS-1	UPR-200-E-7	5.39E-03	1.37E-04	1.20E-04	2.75E-06	2.03E-13	8.00E-06	2.81E-07
200-IS-1	UPR-200-E-77	8.60E-02	1.33E-07	1.20E-07	2.38E-04	5.22E-18	1.16E-05	1.52E-07
200-IS-1	UPR-200-E-78	1.50E+01	1.60E-04	1.30E-04	8.43E-04	6.25E-09	1.61E-04	7.04E-04
200-IS-1	UPR-200-E-79	8.81E+00	3.84E-03	3.42E-03	1.25E-02	1.66E-12	1.41E-03	3.90E-05
200-IS-1	UPR-200-E-84	1.20E-04	2.30E-07	1.91E-07	1.21E-06	6.05E-14	2.03E-07	3.00E-08
200-IS-1	UPR-200-E-86	1.60E+02	1.18E+00	9.44E-01	6.20E+00	3.29E-06	1.27E+00	3.44E-01
200-IS-1	UPR-200-W-102	3.24E-03	0.00E+00	0.00E+00	1.65E-06	1.55E-12	2.68E-05	9.41E-07
200-IS-1	UPR-200-W-130	1.42E-10	3.97E-12	0.00E+00	1.76E-11	8.51E-18	1.22E-15	1.05E-14
200-IS-1	UPR-200-W-131	3.75E-02	4.35E-08	3.85E-08	5.64E-05	4.79E-17	4.86E-06	1.45E-07
200-IS-1	UPR-200-W-135	9.38E+00	2.41E-05	2.11E-05	4.36E-02	3.83E-14	2.97E-03	1.04E-04
200-IS-1	UPR-200-W-21	2.75E+01	7.07E-05	6.20E-05	1.28E-01	1.12E-13	8.70E-03	3.05E-04
200-IS-1	UPR-200-W-28	5.73E+00	6.65E-06	5.88E-06	8.62E-03	7.32E-15	7.43E-04	2.21E-05
200-IS-1	UPR-200-W-29	2.54E-01	4.67E-03	4.11E-03	7.66E-04	4.99E-12	6.11E-04	1.76E-05
200-IS-1	UPR-200-W-32	0.00E+00	0.00E+00	0.00E+00	1.55E-05	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	1.91E+01	4.91E-05	4.30E-05	8.87E-02	7.79E-14	6.04E-03	2.12E-04
200-IS-1	UPR-200-W-97	1.87E-02	4.79E-04	4.20E-04	9.51E-06	6.08E-13	2.62E-05	9.20E-07
200-IS-1	UPR-200-W-98	8.18E-01	1.27E-06	1.14E-06	2.27E-03	4.96E-17	1.10E-04	1.44E-06
200-OA-1	2101-M-Pond	1.69E-04	0.00E+00	0.00E+00	0.00E+00	9.70E-07	0.00E+00	0.00E+00
200-OA-1	216-S-10P	8.28E-01	1.83E-03	1.51E-03	1.15E-02	1.10E-03	1.67E-03	3.05E-04
200-OA-1	216-S-19	1.63E-04	0.00E+00	0.00E+00	0.00E+00	1.49E-06	0.00E+00	0.00E+00
200-OA-1	216-S-26	2.74E-05	0.00E+00	0.00E+00	0.00E+00	2.50E-07	0.00E+00	0.00E+00
200-OA-1	216-T-1	2.70E+00	1.06E-04	9.42E-05	9.66E-04	8.15E-14	7.01E-05	2.05E-06
200-OA-1	216-W-LWC	1.92E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-1%2stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-1&2	1.68E-02	1.07E-06	0.00E+00	4.77E-06	4.39E-10	2.24E-10	1.52E-22
200-PW-1	216-Z-12	7.05E-01	4.74E-05	0.00E+00	2.11E-04	3.74E-08	1.17E-08	1.37E-20
200-PW-1	216-Z-12stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-12vit	7.19E-03	3.11E-08	0.00E+00	1.39E-07	4.80E-13	8.20E-12	0.00E+00
200-PW-1	216-Z-18	6.79E-02	8.96E-06	0.00E+00	3.98E-05	8.63E-09	2.28E-09	3.00E-21
200-PW-1	216-Z-18stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-PW-1	216-Z-1A	9.83E-01	1.61E-05	0.00E+00	7.14E-05	1.17E-08	4.10E-09	5.57E-21
200-PW-1	216-Z-3	1.63E-01	9.62E-07	0.00E+00	4.28E-06	1.13E-11	2.28E-10	0.00E+00
200-PW-1	216-Z-9	7.16E-02	9.45E-06	0.00E+00	4.20E-05	8.81E-09	2.40E-09	3.20E-21
200-PW-1	216-Z-9mined	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-9stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	241-Z-361	3.67E-01	6.77E-06	0.00E+00	3.01E-05	1.35E-09	1.52E-09	8.08E-22
200-PW-3	216-A-24	1.74E+00	4.76E-02	1.04E-02	8.59E-03	2.58E-09	1.52E-02	3.55E-03
200-PW-3	216-A-31	1.27E+00	4.40E-02	9.57E-03	7.94E-03	2.39E-09	1.40E-02	3.28E-03
200-PW-3	216-A-7	1.02E+01	3.54E-01	7.71E-02	6.39E-02	1.93E-08	1.13E-01	2.64E-02
200-PW-3	216-A-8	8.65E+00	2.85E-01	6.21E-02	5.15E-02	1.55E-08	9.10E-02	2.13E-02
200-PW-6	216-Z-10	4.77E+00	2.10E-05	0.00E+00	9.33E-05	3.06E-10	5.44E-09	8.08E-21
200-PW-6	216-Z-5	3.69E+00	1.62E-05	0.00E+00	7.21E-05	2.36E-10	4.21E-09	6.14E-21
200-PW-6	216-Z-8	1.65E-05	2.18E-09	0.00E+00	9.68E-09	2.03E-12	5.54E-13	7.39E-25
200-PW-6	241-Z-8	1.65E-05	2.18E-09	0.00E+00	9.68E-09	2.03E-12	5.54E-13	7.39E-25
200-SW-2	216-C-9	1.31E+00	1.89E-04	1.52E-04	1.01E-03	2.88E-10	1.97E-04	4.69E-05
200-SW-2	216-T-4A	2.87E+00	2.60E-04	2.31E-04	6.68E-02	2.80E-08	1.72E-04	5.24E-06
200-WA-1	200-W-22	0.00E+00	0.00E+00	0.00E+00	2.13E-06	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-9	1.79E-02	7.33E-06	6.49E-06	6.66E-05	5.62E-15	4.84E-06	1.41E-07
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	9.58E+02	5.87E-01	0.00E+00	2.60E+00	2.08E-11	8.79E-05	1.24E-17
200-WA-1	216-S-12	1.40E+00	8.56E-04	5.60E-07	3.80E-03	1.17E-12	7.47E-07	1.13E-07
200-WA-1	216-S-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	7.45E+01	3.59E-03	2.69E-03	2.57E-02	1.16E-03	5.33E-03	4.72E-03
200-WA-1	216-S-22	3.31E-06	8.54E-09	7.08E-09	5.38E-08	1.46E-14	7.83E-09	1.43E-09
200-WA-1	216-S-23	1.15E-03	2.96E-06	2.45E-06	1.86E-05	5.05E-12	2.71E-06	4.94E-07
200-WA-1	216-S-25	4.85E-05	0.00E+00	0.00E+00	0.00E+00	1.94E-08	0.00E+00	0.00E+00
200-WA-1	216-S-3	3.31E-01	2.28E-03	1.87E-03	1.42E-02	4.59E-09	2.11E-03	4.40E-04
200-WA-1	216-S-4	1.81E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-5	1.79E+00	3.14E-03	2.69E-03	2.61E-02	6.35E-10	2.24E-03	1.78E-04
200-WA-1	216-S-6	5.85E+00	2.38E-03	3.20E-04	1.61E-02	6.63E-10	3.54E-04	6.44E-05
200-WA-1	216-S-7	1.47E+03	5.59E-01	0.00E+00	2.48E+00	2.02E-09	8.77E-05	1.69E-17

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-WA-1	216-S-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	3.35E-01	6.17E-03	5.43E-03	8.43E-03	6.60E-12	8.07E-04	2.32E-05
200-WA-1	216-T-2	7.92E-01	3.24E-04	2.87E-04	2.94E-03	2.49E-13	2.14E-04	6.23E-06
200-WA-1	216-T-20	7.64E-02	3.33E-05	2.97E-05	1.09E-04	1.44E-14	1.22E-05	3.38E-07
200-WA-1	216-T-27	4.17E+00	2.01E-04	1.51E-04	1.44E-03	4.75E-05	2.98E-04	2.64E-04
200-WA-1	216-T-28	1.25E+02	6.03E-03	4.53E-03	4.32E-02	3.18E-04	8.95E-03	7.92E-03
200-WA-1	216-T-29	5.07E-03	2.07E-06	1.84E-06	1.88E-05	1.59E-15	1.37E-06	3.99E-08
200-WA-1	216-T-33	2.39E-04	1.08E-07	9.43E-08	4.10E-03	1.89E-09	7.55E-08	1.75E-08
200-WA-1	216-T-34	4.64E-03	2.95E-06	2.35E-06	1.56E-05	3.80E-05	3.20E-06	4.37E-06
200-WA-1	216-T-35	7.15E-03	0.00E+00	0.00E+00	0.00E+00	6.52E-05	0.00E+00	0.00E+00
200-WA-1	216-T-36	1.89E-05	1.07E-07	8.55E-08	5.69E-07	1.93E-08	1.17E-07	1.59E-07
200-WA-1	216-T-8	6.65E-03	2.72E-06	2.41E-06	2.47E-05	2.09E-15	1.79E-06	5.23E-08
200-WA-1	216-U-1&2	1.17E+00	1.36E-06	1.20E-06	7.27E+00	1.50E-15	1.52E-04	4.53E-06
200-WA-1	216-U-12	1.67E+01	3.45E-03	2.70E-03	6.78E-01	7.78E-09	6.82E-03	3.06E-03
200-WA-1	216-U-13	1.50E-03	6.12E-07	5.42E-07	5.56E-06	4.70E-16	4.04E-07	1.18E-08
200-WA-1	216-U-14	7.52E-02	1.37E-04	1.12E-04	8.21E-04	7.66E-06	1.33E-04	7.96E-05
200-WA-1	216-U-15	1.13E-02	2.25E-06	1.99E-06	3.52E-02	1.73E-15	2.24E-06	6.57E-08
200-WA-1	216-U-16	6.72E-08	0.00E+00	0.00E+00	0.00E+00	4.56E-06	0.00E+00	0.00E+00
200-WA-1	216-U-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-3	1.39E-07	0.00E+00	0.00E+00	5.94E-04	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-4	3.95E-02	1.61E-05	1.43E-05	1.47E-04	1.26E-14	1.08E-05	3.12E-07
200-WA-1	216-U-4A	7.42E-04	2.58E-08	2.29E-08	2.35E-07	6.19E-06	1.70E-08	4.97E-10
200-WA-1	216-U-4B	4.12E-05	0.00E+00	0.00E+00	0.00E+00	3.75E-07	0.00E+00	0.00E+00
200-WA-1	216-U-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	3.87E-07	2.20E-09	1.75E-09	1.17E-08	3.95E-10	2.39E-09	3.26E-09
200-WA-1	216-U-8	3.25E-02	1.88E-05	1.63E-05	2.71E+00	1.12E-11	1.41E-05	1.34E-06
200-WA-1	216-Z-13	1.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-14	1.57E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-15	1.63E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-16	4.39E-05	1.23E-06	0.00E+00	5.45E-06	2.63E-12	3.77E-10	3.26E-09
200-WA-1	216-Z-17	1.58E-05	4.43E-07	0.00E+00	1.97E-06	9.49E-13	1.36E-10	1.17E-09

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
200-WA-1	216-Z-21	4.82E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-4	2.28E-01	1.00E-06	0.00E+00	4.46E-06	1.46E-11	2.60E-10	3.87E-22
200-WA-1	216-Z-6	4.86E-01	2.13E-06	0.00E+00	9.50E-06	3.11E-11	5.54E-10	8.22E-22
200-WA-1	216-Z-7	1.53E+02	6.73E-04	1.06E-06	3.00E-03	2.49E-07	1.62E-06	1.97E-06
200-WA-1	UPR-200-W-101	0.00E+00	0.00E+00	0.00E+00	1.34E-04	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-138	0.00E+00	0.00E+00	0.00E+00	4.41E-04	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	1.42E-06	8.62E-10	7.45E-10	2.26E-03	5.66E-16	6.54E-10	6.57E-11
200-WA-1	UPR-200-W-19	8.49E-06	9.86E-12	8.72E-12	5.11E-05	1.09E-20	1.10E-09	3.27E-11
200-WA-1	UPR-200-W-20	1.39E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-33	5.73E-03	1.47E-08	1.29E-08	2.66E-05	2.34E-17	1.81E-06	6.36E-08
200-WA-1	UPR-200-W-39	0.00E+00	0.00E+00	0.00E+00	1.14E-05	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	2.78E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-95	9.83E-02	1.66E-04	1.42E-04	1.05E-03	2.21E-12	1.14E-04	7.04E-06
WMA-A-AX	216-A-16	6.75E-06	3.83E-08	3.05E-08	2.03E-07	6.88E-09	4.16E-08	5.68E-08
WMA-A-AX	216-A-17	3.32E-06	1.88E-08	1.50E-08	9.99E-08	3.38E-09	2.05E-08	2.79E-08
WMA-A-AX	216-A-23A	6.94E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	216-A-23B	6.94E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	216-A-39	4.96E-02	6.46E-04	5.10E-04	3.39E-03	1.02E-09	7.47E-04	1.75E-04
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	9.65E+00	5.45E-02	4.42E-02	2.87E-01	1.94E-07	5.58E-02	1.65E-02
WMA-A-AX	241-A-105	1.70E+02	1.83E+00	1.46E+00	9.62E+00	2.53E-06	2.04E+00	4.57E-01
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	8.19E-01	4.54E-03	3.68E-03	2.39E-02	1.68E-08	4.64E-03	1.40E-03
WMA-A-AX	UPR-200-E-119	2.53E-04	1.40E-06	1.14E-06	7.37E-06	5.20E-12	1.43E-06	4.31E-07
WMA-B-BX-BY	200-E-60	1.93E-07	1.10E-09	8.73E-10	5.81E-09	1.96E-10	1.19E-09	1.62E-09
WMA-B-BX-BY	241-B-101	2.05E+02	2.96E-02	2.36E-02	1.57E-01	1.12E-07	3.77E-02	7.08E-03
WMA-B-BX-BY	241-B-105	3.38E+02	5.03E+00	4.05E+00	2.69E+01	4.59E-09	6.29E+00	3.85E-02
WMA-B-BX-BY	241-B-106	4.06E+00	3.66E-02	2.94E-02	1.95E-01	1.10E-08	4.50E-02	2.02E-03
WMA-B-BX-BY	241-B-107	1.96E+01	3.22E-02	2.64E-02	1.72E-01	3.28E-08	8.22E-02	5.63E-03
WMA-B-BX-BY	241-B-110**	9.32E+01	1.10E+00	8.76E-01	5.83E+00	1.21E-06	1.28E+00	2.05E-01
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	9.76E+01	1.27E-02	1.01E-02	6.75E-02	6.93E-08	1.41E-02	5.89E-03
WMA-B-BX-BY	241-BX-102*	1.98E+03	9.62E-01	7.74E-01	7.52E+00	6.35E-07	1.46E+00	5.08E-02
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	2.30E+01	3.41E-01	2.75E-01	1.83E+00	3.12E-10	4.27E-01	2.61E-03
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	5.83E+00	1.07E-01	9.45E-02	1.76E-02	1.15E-10	1.40E-02	4.04E-04
WMA-B-BX-BY	UPR-200-E-108	1.84E+00	4.73E-06	4.15E-06	8.55E-03	7.51E-15	5.83E-04	2.04E-05
WMA-B-BX-BY	UPR-200-E-109	1.41E+00	1.63E-06	1.45E-06	2.12E-03	1.80E-15	1.83E-04	5.43E-06
WMA-B-BX-BY	UPR-200-E-110	1.29E+00	2.38E-02	2.09E-02	3.90E-03	2.54E-11	3.11E-03	8.94E-05
WMA-B-BX-BY	UPR-200-E-38	5.07E+01	5.49E-01	4.43E-01	2.94E+00	8.29E-07	5.74E-01	1.36E-01
WMA-B-BX-BY	UPR-200-E-6	2.58E-01	4.75E-03	4.18E-03	7.79E-04	5.08E-12	6.21E-04	1.79E-05
WMA-B-BX-BY	UPR-200-E-73	8.60E-01	2.21E-06	1.94E-06	4.00E-03	3.51E-15	2.72E-04	9.55E-06
WMA-B-BX-BY	UPR-200-E-74	5.07E-06	2.07E-09	1.84E-09	1.89E-08	1.59E-18	1.37E-09	3.99E-11
WMA-B-BX-BY	UPR-200-E-75	2.58E-01	4.75E-03	4.18E-03	7.79E-04	5.08E-12	6.21E-04	1.79E-05
WMA-C	216-C-8	2.54E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-101	2.63E+00	1.45E-02	1.21E-02	7.65E-02	4.10E-09	1.30E-02	1.92E-03
WMA-C	241-C-104	1.74E+01	1.16E-03	9.86E-04	1.13E-02	9.55E-11	5.22E-02	1.24E-04
WMA-C	241-C-105	2.99E+02	1.91E+00	1.55E+00	1.00E+01	1.88E-06	1.94E+00	4.07E-01
WMA-C	241-C-108	2.74E+03	2.96E-02	2.41E-02	1.58E-01	1.14E-06	3.92E-02	1.28E-01
WMA-C	241-C-110	7.50E+00	4.17E-04	3.75E-04	1.12E-02	2.79E-14	9.94E-04	2.90E-05
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	2.85E+01	3.04E-04	2.47E-04	1.60E-03	1.18E-08	3.05E-04	1.33E-03
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	4.69E-02	5.45E-08	4.82E-08	7.07E-05	6.00E-17	6.09E-06	1.81E-07
WMA-C	UPR-200-E-16	1.21E-01	7.36E-06	6.17E-06	5.38E-05	7.31E-13	3.97E-04	8.64E-07

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
WMA-C	UPR-200-E-81	7.34E+01	3.80E-03	2.98E-03	2.74E-02	9.66E-08	2.75E-01	2.88E-03
WMA-C	UPR-200-E-82	2.67E+01	3.30E-01	2.62E-01	1.74E+00	5.15E-07	3.70E-01	8.69E-02
WMA-S-SX	241-S-104	7.26E+01	3.92E-03	3.14E-03	2.82E-02	1.22E-08	2.21E-01	1.52E-03
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	1.25E+02	4.20E-01	3.44E-01	2.64E+00	9.51E-07	3.87E-01	8.72E-02
WMA-S-SX	241-SX-108	7.39E+02	1.98E+00	1.64E+00	1.25E+01	3.32E-06	1.70E+00	3.26E-01
WMA-S-SX	241-SX-109	1.40E+01	4.47E-02	3.67E-02	2.81E-01	9.51E-08	4.04E-02	8.82E-03
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	2.55E+01	1.37E-01	1.11E-01	7.37E-01	2.17E-07	1.43E-01	3.40E-02
WMA-S-SX	241-SX-112	1.67E+02	1.15E+00	9.45E-01	7.13E+00	2.32E-06	1.06E+00	2.22E-01
WMA-S-SX	241-SX-113	8.41E+01	1.42E-01	1.22E-01	8.99E-01	1.89E-09	9.74E-02	6.03E-03
WMA-S-SX	241-SX-114	1.22E+01	4.60E-02	3.75E-02	2.89E-01	1.13E-07	4.33E-02	1.02E-02
WMA-S-SX	241-XS-115	2.08E+02	4.82E-01	3.93E-01	3.03E+00	1.19E-06	6.98E-01	1.08E-01
WMA-S-SX	316-4	1.81E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-101	4.63E+02	7.20E-01	5.92E-01	4.49E+00	1.44E-06	1.73E+00	1.43E-01
WMA-T	241-T-102	4.65E+01	7.37E-03	5.91E-03	4.02E-02	3.56E-08	8.20E-03	3.09E-03
WMA-T	241-T-103	3.38E+01	4.15E-02	3.35E-02	2.25E-01	8.04E-08	4.39E-02	1.10E-02
WMA-T	241-T-106	6.31E+03	7.33E+00	5.92E+00	3.96E+01	1.42E-05	7.76E+00	1.95E+00
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	5.61E-02	1.44E-03	1.26E-03	2.85E-05	1.82E-12	7.87E-05	2.76E-06
WMA-TX-TY	241-TX-104	3.68E+01	5.70E-05	5.13E-05	1.02E-01	2.23E-15	4.95E-03	6.48E-05
WMA-TX-TY	241-TX-105	8.25E+02	1.45E-03	1.30E-03	2.61E+00	7.42E-13	1.42E-01	3.06E-03
WMA-TX-TY	241-TX-114	3.28E+01	3.50E-01	2.84E-01	1.93E+00	6.75E-07	3.72E-01	9.22E-02
WMA-TX-TY	241-TX-118	8.19E+00	8.74E-02	7.09E-02	4.83E-01	1.69E-07	9.31E-02	2.30E-02
WMA-TX-TY	241-TY-104	6.56E+00	7.00E-02	5.68E-02	3.86E-01	1.35E-07	7.45E-02	1.84E-02
WMA-TX-TY	241-TY-105	3.87E+02	4.49E-04	3.97E-04	5.82E-01	4.94E-13	5.02E-02	1.49E-03
WMA-TX-TY	241-TX-107	6.10E+00	6.46E-02	5.24E-02	3.57E-01	1.25E-07	6.88E-02	1.70E-02
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	1.70E+01	1.80E-01	1.46E-01	9.94E-01	3.47E-07	1.92E-01	4.75E-02
WMA-TX-TY	241-TY-106	7.97E+01	9.25E-05	8.17E-05	1.20E-01	1.02E-13	1.03E-02	3.07E-04
WMA-TX-TY	UPR-200-W-100	6.45E-01	1.19E-02	1.04E-02	1.95E-03	1.27E-11	1.55E-03	4.47E-05

OPU Name	WIDS-Site-Name	Yttrium 90 [Ci]	Zirconium 93 [Ci]	Niobium 93 [Ci]	Technetium 99 [Ci]	Ruthenium 106 [Ci]	Cadmium 113 [Ci]	Antimony 125 [Ci]
WMA-TX-TY	UPR-200-W-12	4.33E-02	1.89E-05	1.68E-05	6.14E-05	8.16E-15	6.91E-06	1.92E-07
WMA-TX-TY	UPR-200-W-127	5.97E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-U	241-U-101	1.45E+02	2.44E-01	2.10E-01	1.55E+00	3.25E-09	1.68E-01	1.04E-02
WMA-U	241-U-104	1.83E+02	2.84E-04	2.56E-04	5.07E-01	1.11E-14	2.47E-02	3.23E-04
WMA-U	241-U-110	2.07E+01	1.71E-01	1.39E-01	9.48E-01	3.24E-07	1.91E-01	4.45E-02
WMA-U	241-U-112	5.42E+02	8.86E-01	7.62E-01	5.52E+00	1.15E-08	6.18E-01	3.69E-02
WMA-U	UPR-200-W-132	4.69E+00	1.21E-05	1.06E-05	2.18E-02	1.91E-14	1.49E-03	5.21E-05
WMA-U	UPR-200-W-24	3.41E-01	5.28E-07	4.75E-07	9.44E-04	2.07E-17	4.59E-05	6.01E-07
* Scaled for UNH solubility of the 1951 o								
** matched leak volume bounds								

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-BC-1	216-B-14	3.57E-01	4.23E-02	2.71E-06	3.05E+02	2.88E+02	3.51E+03	1.28E-01	9.74E+00
200-BC-1	216-B-15	2.76E-01	3.27E-02	2.09E-06	2.36E+02	2.23E+02	2.71E+03	9.91E-02	7.53E+00
200-BC-1	216-B-16	2.20E-01	2.96E-02	1.76E-06	1.98E+02	1.87E+02	2.20E+03	7.99E-02	6.07E+00
200-BC-1	216-B-17	9.81E-02	1.90E-02	9.37E-07	1.05E+02	9.90E+01	1.05E+03	3.75E-02	2.85E+00
200-BC-1	216-B-18	3.73E-01	4.41E-02	2.82E-06	3.18E+02	3.00E+02	3.66E+03	1.34E-01	1.02E+01
200-BC-1	216-B-19	2.12E-01	3.46E-02	1.85E-06	2.08E+02	1.96E+02	2.20E+03	7.89E-02	6.00E+00
200-BC-1	216-B-20	1.62E-01	2.53E-02	1.39E-06	1.56E+02	1.47E+02	1.67E+03	6.01E-02	4.57E+00
200-BC-1	216-B-21	1.94E-01	2.44E-02	1.51E-06	1.70E+02	1.60E+02	1.93E+03	7.01E-02	5.33E+00
200-BC-1	216-B-22	1.80E-01	2.53E-02	1.47E-06	1.65E+02	1.56E+02	1.81E+03	6.57E-02	5.00E+00
200-BC-1	216-B-23	1.71E-01	2.41E-02	1.40E-06	1.57E+02	1.48E+02	1.72E+03	6.25E-02	4.75E+00
200-BC-1	216-B-24	2.13E-01	2.52E-02	1.61E-06	1.82E+02	1.71E+02	2.09E+03	7.64E-02	5.81E+00
200-BC-1	216-B-25	2.15E-01	2.54E-02	1.63E-06	1.83E+02	1.73E+02	2.11E+03	7.70E-02	5.85E+00
200-BC-1	216-B-26	2.08E-01	2.46E-02	1.57E-06	1.77E+02	1.67E+02	2.04E+03	7.45E-02	5.66E+00
200-BC-1	216-B-27	1.93E-01	2.29E-02	1.46E-06	1.65E+02	1.56E+02	1.90E+03	6.93E-02	5.27E+00
200-BC-1	216-B-28	1.95E-01	2.68E-02	1.58E-06	1.77E+02	1.67E+02	1.96E+03	7.11E-02	5.40E+00
200-BC-1	216-B-29	2.04E-01	2.42E-02	1.55E-06	1.74E+02	1.64E+02	2.00E+03	7.32E-02	5.56E+00
200-BC-1	216-B-30	1.57E-01	2.61E-02	1.39E-06	1.55E+02	1.47E+02	1.63E+03	5.86E-02	4.46E+00
200-BC-1	216-B-31	1.60E-01	2.65E-02	1.41E-06	1.58E+02	1.49E+02	1.66E+03	5.97E-02	4.54E+00
200-BC-1	216-B-32	1.52E-01	2.58E-02	1.36E-06	1.52E+02	1.43E+02	1.58E+03	5.69E-02	4.32E+00
200-BC-1	216-B-33	1.41E-01	2.59E-02	1.31E-06	1.47E+02	1.38E+02	1.50E+03	5.34E-02	4.06E+00
200-BC-1	216-B-34	1.44E-01	2.67E-02	1.34E-06	1.51E+02	1.42E+02	1.53E+03	5.47E-02	4.16E+00
200-BC-1	216-B-52	2.59E-01	4.56E-02	2.36E-06	2.64E+02	2.49E+02	2.73E+03	9.77E-02	7.43E+00
200-BC-1	216-B-53A	3.14E-05	0.00E+00	8.05E-05	1.05E+01	9.96E+00	2.84E-01	1.82E-04	1.31E-02
200-BC-1	216-B-53B	1.82E-05	0.00E+00	4.68E-05	6.13E+00	5.79E+00	1.65E-01	1.06E-04	7.61E-03
200-BC-1	216-B-54	1.82E-05	0.00E+00	4.68E-05	6.14E+00	5.80E+00	1.65E-01	1.06E-04	7.61E-03
200-BC-1	216-B-58	1.46E-05	0.00E+00	3.75E-05	4.91E+00	4.64E+00	1.32E-01	8.47E-05	6.09E-03
200-CB-1	200-E-100	7.92E-09	7.23E-10	3.48E-11	1.34E-03	1.27E-03	6.80E-05	3.88E-09	2.90E-07
200-CB-1	200-E-28	0.00E+00	0.00E+00	0.00E+00	1.75E-03	1.66E-03	0.00E+00	0.00E+00	0.00E+00
200-CB-1	200-E-55	1.44E-07	1.68E-08	3.31E-10	3.78E-02	3.57E-02	1.67E-03	6.18E-08	4.66E-06
200-CB-1	200-E-85	3.14E-08	4.56E-09	7.54E-07	9.85E-03	9.30E-03	1.47E-04	2.73E-08	2.19E-06
200-CB-1	200-E-88	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-CB-1	200-E-89	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-CB-1	200-E-90	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-CB-1	200-E-91	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-CB-1	200-E-92	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-CB-1	200-E-93	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-CB-1	200-E-97	1.47E-07	1.71E-08	3.38E-10	3.86E-02	3.64E-02	1.70E-03	6.31E-08	4.76E-06
200-CB-1	200-E-98	1.22E-07	1.43E-08	2.82E-10	3.21E-02	3.03E-02	1.42E-03	5.26E-08	3.97E-06
200-CB-1	200-E-99	7.92E-09	7.23E-10	3.48E-11	1.34E-03	1.27E-03	6.80E-05	3.88E-09	2.90E-07
200-CB-1	216-B-13	2.20E-08	2.56E-09	5.07E-11	5.74E-03	5.42E-03	2.55E-04	9.45E-09	7.13E-07
200-CB-1	216-B-4	4.19E-08	4.88E-09	9.66E-11	1.08E-02	1.02E-02	4.85E-04	1.80E-08	1.36E-06
200-CB-1	216-B-60	2.79E-10	1.11E-05	6.61E-09	8.76E-05	8.27E-05	1.30E-06	2.41E-10	1.95E-08
200-CB-1	UPR-200-E-1	1.50E-04	1.54E-06	8.56E-09	6.37E+00	6.02E+00	3.47E+00	4.30E-05	4.17E-03
200-CB-1	UPR-200-E-80	1.97E-06	1.17E-07	7.25E-10	5.39E-01	5.09E-01	2.07E-02	2.56E-07	2.48E-05
200-CB-1	UPR-200-E-85	4.65E-03	2.11E-04	3.02E-05	3.72E+01	3.52E+01	1.46E+01	2.71E-03	2.02E-01
200-CB-1	UPR-200-E-87	1.79E-06	4.46E-10	2.76E-12	2.05E-03	1.94E-03	3.48E-01	4.32E-06	4.18E-04
200-CP-1	200-E-107	5.90E-11	2.35E-06	1.45E-09	1.85E-05	1.75E-05	2.76E-07	5.24E-11	4.13E-09
200-CP-1	200-E-62	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-63	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-64	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-65	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-67	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-69	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-70	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-71	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-72	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-73	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-74	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-75	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-76	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-77	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-78	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-79	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	200-E-80	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-CP-1	200-E-81	1.00E-08	1.46E-09	2.42E-07	3.15E-03	2.97E-03	4.69E-05	8.77E-09	7.01E-07
200-CP-1	200-E-84	0.00E+00	1.40E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-11	0.00E+00	5.51E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-12	0.00E+00	5.51E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CP-1	216-A-13	2.20E-10	3.20E-11	5.22E-09	6.92E-05	6.53E-05	1.03E-06	1.90E-10	1.54E-08
200-CP-1	216-A-14	2.20E-11	3.19E-12	5.21E-10	6.91E-06	6.52E-06	1.03E-07	1.90E-11	1.54E-09
200-CP-1	216-A-32	8.81E-11	1.28E-11	2.09E-09	2.77E-05	2.61E-05	4.12E-07	7.60E-11	6.16E-09
200-CP-1	216-A-35	2.20E-10	3.20E-11	5.22E-09	6.91E-05	6.53E-05	1.03E-06	1.90E-10	1.54E-08
200-CP-1	UPR-200-E-39	0.00E+00	0.00E+00	1.56E-06	9.76E-01	9.23E-01	3.61E-02	1.09E-05	1.21E-03
200-CR-1	UPR-200-W-61	2.35E-04	3.53E-05	3.29E-06	6.23E+01	5.89E+01	2.44E+00	2.47E-04	1.67E-02
200-CR-1	UPR-200-W-96	6.98E-10	1.02E-10	1.34E-10	2.05E-04	1.93E-04	4.39E-06	6.57E-10	4.40E-08
200-CW-1	216-A-25	2.28E-02	1.40E-02	1.01E-02	7.27E+03	6.86E+03	4.46E+01	1.03E-02	8.22E-01
200-CW-1	216-B-3	3.24E-03	3.20E-03	2.57E-04	4.26E+02	4.02E+02	2.34E+01	1.71E-03	1.28E-01
200-CW-1	216-S-16P	2.39E-04	3.50E-05	4.65E-05	7.07E+01	6.68E+01	1.51E+00	2.27E-04	1.52E-02
200-CW-1	216-S-17	3.15E-04	4.71E-05	1.01E-05	8.44E+01	7.97E+01	3.14E+00	3.28E-04	2.21E-02
200-CW-1	216-U-10	2.43E-04	2.14E-01	1.92E-03	7.41E+01	7.00E+01	1.40E+00	2.24E-04	6.33E-02
200-CW-3	216-N-6	1.51E-06	1.76E-07	3.48E-09	3.90E-01	3.68E-01	1.75E-02	6.48E-07	4.89E-05
200-CW-3	216-N-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CW-3	216-N-2	1.51E-06	1.76E-07	3.47E-09	3.90E-01	3.68E-01	1.75E-02	6.47E-07	4.88E-05
200-CW-3	216-N-3	1.51E-06	1.76E-07	3.47E-09	3.90E-01	3.68E-01	1.75E-02	6.47E-07	4.88E-05
200-CW-3	216-N-4	1.51E-06	1.76E-07	3.48E-09	3.90E-01	3.68E-01	1.75E-02	6.48E-07	4.89E-05
200-CW-3	216-N-5	1.51E-06	1.76E-07	3.47E-09	3.90E-01	3.68E-01	1.75E-02	6.47E-07	4.88E-05
200-CW-3	216-N-7	1.51E-06	1.76E-07	3.47E-09	3.90E-01	3.68E-01	1.75E-02	6.47E-07	4.88E-05
200-CW-5	216-Z-11	0.00E+00	0.00E+00	5.70E-11	1.16E-03	1.10E-03	1.14E-06	3.54E-10	3.91E-08
200-CW-5	216-Z-19	0.00E+00	0.00E+00	2.32E-11	4.75E-04	4.49E-04	4.63E-07	1.44E-10	1.59E-08
200-CW-5	216-Z-1D	0.00E+00	0.00E+00	1.84E-10	3.71E-03	3.51E-03	3.64E-06	1.13E-09	1.25E-07
200-CW-5	216-Z-20	0.00E+00	0.00E+00	0.00E+00	4.47E-07	4.23E-07	0.00E+00	0.00E+00	0.00E+00
200-DV-1	216-B-11A&B	4.10E-05	4.54E-06	8.41E-08	9.67E+00	9.13E+00	4.95E-01	1.69E-05	1.29E-03
200-DV-1	216-B-35	1.10E-02	1.87E-03	5.74E-06	4.85E+02	4.58E+02	2.25E+02	1.23E-02	8.61E-01
200-DV-1	216-B-36	2.01E-02	3.43E-03	1.05E-05	8.88E+02	8.39E+02	4.11E+02	2.25E-02	1.58E+00
200-DV-1	216-B-37	4.48E-02	7.63E-03	2.34E-05	1.98E+03	1.87E+03	9.16E+02	5.02E-02	3.51E+00
200-DV-1	216-B-38	1.48E-02	2.53E-03	7.74E-06	6.55E+02	6.18E+02	3.03E+02	1.66E-02	1.16E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-DV-1	216-B-39	1.60E-02	2.72E-03	8.34E-06	7.05E+02	6.66E+02	3.27E+02	1.79E-02	1.25E+00
200-DV-1	216-B-40	1.70E-02	2.90E-03	8.88E-06	7.51E+02	7.09E+02	3.48E+02	1.91E-02	1.33E+00
200-DV-1	216-B-41	1.49E-02	2.54E-03	7.80E-06	6.59E+02	6.23E+02	3.05E+02	1.67E-02	1.17E+00
200-DV-1	216-B-42	5.60E-02	6.63E-03	4.24E-07	4.77E+01	4.51E+01	5.50E+02	2.01E-02	1.53E+00
200-DV-1	216-B-43	7.91E-02	9.37E-03	6.00E-07	6.75E+01	6.37E+01	7.77E+02	2.84E-02	2.16E+00
200-DV-1	216-B-44	2.09E-01	2.47E-02	1.58E-06	1.78E+02	1.68E+02	2.05E+03	7.50E-02	5.70E+00
200-DV-1	216-B-45	1.84E-01	2.17E-02	1.39E-06	1.57E+02	1.48E+02	1.80E+03	6.59E-02	5.01E+00
200-DV-1	216-B-46	2.50E-01	2.96E-02	1.89E-06	2.13E+02	2.01E+02	2.46E+03	8.97E-02	6.82E+00
200-DV-1	216-B-47	1.47E-01	1.74E-02	1.11E-06	1.25E+02	1.18E+02	1.45E+03	5.28E-02	4.01E+00
200-DV-1	216-B-48	1.53E-01	1.81E-02	1.16E-06	1.30E+02	1.23E+02	1.50E+03	5.48E-02	4.16E+00
200-DV-1	216-B-49	2.50E-01	2.96E-02	1.89E-06	2.13E+02	2.01E+02	2.46E+03	8.97E-02	6.82E+00
200-DV-1	216-B-5	1.80E-03	1.88E-06	1.17E-08	8.67E+00	8.19E+00	1.88E+02	2.33E-03	2.26E-01
200-DV-1	216-B-50	8.63E-04	9.34E-05	6.32E-05	5.49E+01	5.18E+01	2.43E-01	4.78E-05	3.60E-03
200-DV-1	216-B-57	2.59E-03	2.80E-04	1.90E-04	1.64E+02	1.55E+02	7.28E-01	1.43E-04	1.08E-02
200-DV-1	216-B-7A&B	4.45E-03	6.69E-04	2.90E-04	3.73E+02	3.53E+02	8.42E+02	8.34E-02	6.52E+00
200-DV-1	216-B-8	2.46E-02	2.67E-05	7.06E-07	1.68E+02	1.59E+02	1.40E+03	2.96E-02	2.48E+00
200-DV-1	216-B-9	1.84E-03	1.32E-06	8.34E-08	1.24E+01	1.17E+01	1.10E+02	3.38E-03	2.64E-01
200-DV-1	216-S-13	0.00E+00	0.00E+00	1.40E-04	1.45E+02	1.37E+02	1.75E+00	4.06E-04	2.70E-02
200-DV-1	216-S-21	2.32E-03	3.27E-04	4.78E-04	6.31E+02	5.96E+02	8.47E+00	1.43E-03	9.66E-02
200-DV-1	216-S-9	0.00E+00	2.95E-02	2.08E-05	6.04E+01	5.72E+01	5.05E+00	1.04E-03	1.29E-01
200-DV-1	216-T-14	1.04E-02	1.78E-03	5.45E-06	4.61E+02	4.35E+02	2.13E+02	1.17E-02	8.17E-01
200-DV-1	216-T-15	1.08E-02	1.84E-03	5.64E-06	4.77E+02	4.50E+02	2.21E+02	1.21E-02	8.47E-01
200-DV-1	216-T-16	1.06E-02	1.80E-03	5.52E-06	4.67E+02	4.41E+02	2.16E+02	1.19E-02	8.29E-01
200-DV-1	216-T-17	8.14E-03	1.39E-03	4.25E-06	3.59E+02	3.39E+02	1.66E+02	9.12E-03	6.38E-01
200-DV-1	216-T-18	7.54E-03	1.45E-03	1.08E-08	8.73E-01	8.25E-01	1.86E+02	3.10E-03	3.88E-01
200-DV-1	216-T-19	2.67E-03	0.00E+00	2.16E-07	1.92E+01	1.81E+01	1.59E+02	7.61E-03	5.59E-01
200-DV-1	216-T-21	4.80E-03	8.18E-04	2.51E-06	2.12E+02	2.00E+02	9.82E+01	5.38E-03	3.76E-01
200-DV-1	216-T-22	1.60E-02	2.72E-03	8.34E-06	7.05E+02	6.66E+02	3.27E+02	1.79E-02	1.25E+00
200-DV-1	216-T-23	1.54E-02	2.62E-03	8.05E-06	6.80E+02	6.42E+02	3.15E+02	1.73E-02	1.21E+00
200-DV-1	216-T-24	1.60E-02	2.72E-03	8.34E-06	7.05E+02	6.66E+02	3.27E+02	1.79E-02	1.25E+00
200-DV-1	216-T-25	3.10E-02	5.28E-03	1.62E-05	1.37E+03	1.29E+03	6.33E+02	3.47E-02	2.43E+00
200-DV-1	216-T-26	8.15E-02	1.56E-02	1.16E-07	9.43E+00	8.91E+00	2.01E+03	3.35E-02	4.19E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-DV-1	216-T-3	6.68E-04	4.24E-07	2.62E-09	1.95E+00	1.84E+00	1.01E+02	1.25E-03	1.21E-01
200-DV-1	216-T-32	2.48E-03	2.28E-07	2.38E-08	2.93E+00	2.76E+00	4.54E+02	1.54E-02	1.18E+00
200-DV-1	216-T-5	4.83E-03	0.00E+00	4.09E-07	3.44E+01	3.24E+01	2.56E+02	1.22E-02	8.99E-01
200-DV-1	216-T-6	2.39E-03	3.48E-06	2.16E-08	1.61E+01	1.52E+01	1.42E+02	1.75E-03	1.70E-01
200-DV-1	216-T-7	6.39E-02	1.50E-05	4.36E-06	4.27E+02	4.03E+02	3.94E+03	1.67E-01	1.24E+01
200-EA-1	200-E-103	8.80E-11	1.28E-11	2.09E-09	2.76E-05	2.61E-05	4.12E-07	7.59E-11	6.15E-09
200-EA-1	200-E-25	0.00E+00	0.00E+00	0.00E+00	2.21E-04	2.09E-04	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-41	5.06E-10	3.85E-11	2.82E-12	5.89E-05	5.56E-05	3.44E-06	2.64E-10	1.97E-08
200-EA-1	200-E-54	4.41E-09	6.41E-10	1.09E-07	1.39E-03	1.31E-03	2.06E-05	3.92E-09	3.09E-07
200-EA-1	200-E-56	5.48E-03	2.47E-05	1.31E-03	1.66E+03	1.57E+03	1.49E+03	3.00E-01	2.35E+01
200-EA-1	200-E-57	8.22E-03	3.71E-05	1.97E-03	2.49E+03	2.35E+03	2.23E+03	4.50E-01	3.53E+01
200-EA-1	200-E-68	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-82	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-94	7.86E-09	7.20E-10	3.43E-11	1.34E-03	1.27E-03	6.78E-05	3.84E-09	2.87E-07
200-EA-1	200-E-95	1.47E-07	1.71E-08	3.38E-10	3.85E-02	3.64E-02	1.70E-03	6.31E-08	4.76E-06
200-EA-1	216-A-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	6.56E-03	1.74E+00	8.11E-03	2.84E+01	2.68E+01	2.21E+01	4.72E-03	3.99E-01
200-EA-1	216-A-15	0.00E+00	5.51E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	2.86E-03	1.76E-05	4.62E-07	1.86E+00	1.75E+00	2.72E+01	4.07E-03	3.02E-01
200-EA-1	216-A-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-21	0.00E+00	0.00E+00	6.52E-06	6.37E+01	6.03E+01	3.80E-01	9.83E-05	1.14E-02
200-EA-1	216-A-22	0.00E+00	1.29E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-26	8.49E-11	1.23E-11	2.04E-09	2.67E-05	2.52E-05	3.97E-07	7.40E-11	5.94E-09
200-EA-1	216-A-26A	2.20E-11	3.20E-12	5.22E-10	6.92E-06	6.53E-06	1.03E-07	1.90E-11	1.54E-09
200-EA-1	216-A-27	8.81E-05	7.40E-08	2.37E-04	2.96E+01	2.79E+01	7.95E-01	5.09E-04	3.65E-02
200-EA-1	216-A-28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	7.30E-08	0.00E+00	1.87E-07	2.45E-02	2.32E-02	6.61E-04	4.24E-07	3.04E-05
200-EA-1	216-A-30	4.82E-06	8.91E-03	1.16E-04	1.51E+00	1.43E+00	2.25E-02	4.21E-06	3.37E-04
200-EA-1	216-A-36A	0.00E+00	0.00E+00	1.10E-03	6.87E+02	6.50E+02	2.54E+01	7.71E-03	8.55E-01

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-EA-1	216-A-36B	0.00E+00	8.64E-03	0.00E+00	2.91E+02	2.76E+02	3.33E+00	1.12E-03	1.19E-01
200-EA-1	216-A-37-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-37-2	0.00E+00	5.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-4	1.46E-05	0.00E+00	3.75E-05	4.90E+00	4.63E+00	1.32E-01	8.47E-05	6.09E-03
200-EA-1	216-A-40	1.33E-08	6.03E-10	1.07E-10	1.13E-04	1.07E-04	4.20E-05	7.84E-09	5.84E-07
200-EA-1	216-A-41	6.59E-09	1.68E-06	3.76E-09	7.01E-05	6.62E-05	1.33E-05	3.03E-09	2.43E-07
200-EA-1	216-A-45	8.78E-05	3.26E-02	1.34E-03	1.59E+00	1.51E+00	1.04E-01	1.39E-04	1.64E-02
200-EA-1	216-A-5	4.04E-03	9.63E-01	2.92E-06	1.16E+01	1.10E+01	3.00E+01	4.48E-03	3.33E-01
200-EA-1	216-A-6	2.77E-04	7.30E-02	2.21E-05	1.08E+00	1.02E+00	2.06E+00	3.07E-04	2.28E-02
200-EA-1	216-A-9	0.00E+00	1.40E-04	0.00E+00	5.33E-04	5.04E-04	0.00E+00	0.00E+00	2.32E-05
200-EA-1	216-B-10A	4.18E-05	4.88E-06	9.64E-08	1.08E+01	1.02E+01	4.84E-01	1.80E-05	1.36E-03
200-EA-1	216-B-10B	4.13E-10	1.64E-05	9.80E-09	1.30E-04	1.23E-04	1.93E-06	3.57E-10	2.89E-08
200-EA-1	216-B-12	1.39E-03	1.54E-04	2.86E-06	3.24E+02	3.06E+02	1.67E+01	5.71E-04	4.35E-02
200-EA-1	216-B-51	4.37E-05	5.18E-06	3.31E-10	3.73E-02	3.52E-02	4.30E-01	1.57E-05	1.19E-03
200-EA-1	216-B-55	1.68E-05	7.63E-07	1.36E-07	1.43E-01	1.35E-01	5.32E-02	9.95E-06	7.39E-04
200-EA-1	216-B-59	6.71E-09	3.04E-10	5.39E-11	5.71E-05	5.39E-05	2.12E-05	3.96E-09	2.95E-07
200-EA-1	216-B-6	2.51E-05	2.93E-06	5.79E-08	6.50E+00	6.14E+00	2.91E-01	1.08E-05	8.14E-04
200-EA-1	216-B-62	3.20E-02	1.28E-03	8.12E-03	9.71E+03	9.17E+03	1.87E+02	3.50E-02	2.72E+00
200-EA-1	216-B-63	1.30E-06	5.89E-08	1.04E-08	9.33E-02	8.82E-02	4.10E-03	7.66E-07	5.70E-05
200-EA-1	216-BY-201	1.55E-03	1.84E-04	1.18E-08	1.33E+00	1.25E+00	1.53E+01	5.58E-04	4.24E-02
200-EA-1	216-C-1	3.63E-05	7.73E-06	8.69E-06	1.10E+01	1.04E+01	9.84E+00	1.98E-03	1.56E-01
200-EA-1	216-C-10	1.45E-05	6.55E-08	3.47E-06	4.39E+00	4.15E+00	3.93E+00	7.94E-04	6.24E-02
200-EA-1	216-C-2	0.00E+00	0.00E+00	0.00E+00	9.43E-03	8.92E-03	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-3	7.26E-06	3.27E-08	1.74E-06	2.20E+00	2.07E+00	1.97E+00	3.97E-04	3.12E-02
200-EA-1	216-C-4	1.13E-05	4.95E-08	0.00E+00	5.08E-04	4.81E-04	3.64E-01	1.14E-04	8.59E-03
200-EA-1	216-C-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	3.05E-05	1.34E-07	1.33E-07	3.88E-01	3.67E-01	1.02E+00	3.16E-04	2.40E-02
200-EA-1	216-C-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	UPR-200-E-117	3.17E-04	1.27E-05	8.03E-05	9.62E+01	9.08E+01	1.85E+00	3.47E-04	2.69E-02
200-EA-1	UPR-200-E-40	0.00E+00	0.00E+00	1.20E-07	7.50E-02	7.10E-02	2.77E-03	8.42E-07	9.34E-05
200-EA-1	UPR-200-E-9	1.68E-03	1.99E-04	4.24E-06	4.77E+02	4.51E+02	1.65E+01	6.04E-04	4.59E-02
200-IS-1	UPR-200-W-2	6.30E-04	3.74E-05	2.31E-07	1.72E+02	1.63E+02	6.60E+00	8.18E-05	7.92E-03

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-IS-1	UPR-200-E-145	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	3.42E-06	5.83E-07	1.79E-09	1.51E-01	1.43E-01	7.00E-02	3.84E-06	2.68E-04
200-IS-1	UPR-200-E-7	9.34E-07	0.00E+00	7.49E-11	6.28E-03	5.93E-03	5.70E-02	2.72E-06	2.00E-04
200-IS-1	UPR-200-E-77	1.78E-06	1.05E-07	6.53E-10	4.86E-01	4.58E-01	1.86E-02	2.31E-07	2.23E-05
200-IS-1	UPR-200-E-78	1.12E-05	5.04E-08	2.67E-06	3.38E+00	3.19E+00	3.03E+00	6.11E-04	4.80E-02
200-IS-1	UPR-200-E-79	1.58E-04	1.75E-05	3.24E-07	3.69E+01	3.48E+01	1.91E+00	6.49E-05	4.95E-03
200-IS-1	UPR-200-E-84	1.59E-08	3.80E-06	1.14E-11	4.57E-05	4.32E-05	1.18E-04	1.77E-08	1.31E-06
200-IS-1	UPR-200-E-86	8.24E-02	2.03E-03	2.77E-02	2.57E+04	2.42E+04	3.42E+02	6.71E-02	5.25E+00
200-IS-1	UPR-200-W-102	3.13E-06	0.00E+00	4.49E-11	3.77E-03	3.56E-03	5.54E-01	2.64E-05	1.94E-03
200-IS-1	UPR-200-W-130	0.00E+00	0.00E+00	1.65E-13	1.57E-10	1.48E-10	9.39E-10	3.41E-13	3.59E-11
200-IS-1	UPR-200-W-131	6.11E-07	7.24E-08	1.54E-09	1.73E-01	1.64E-01	6.01E-03	2.19E-07	1.67E-05
200-IS-1	UPR-200-W-135	3.47E-04	4.97E-05	1.19E-06	9.98E+01	9.43E+01	3.31E+00	1.58E-04	1.16E-02
200-IS-1	UPR-200-W-21	1.02E-03	1.46E-04	3.48E-06	2.92E+02	2.76E+02	9.70E+00	4.63E-04	3.40E-02
200-IS-1	UPR-200-W-28	9.34E-05	1.11E-05	2.35E-07	2.65E+01	2.50E+01	9.18E-01	3.35E-05	2.55E-03
200-IS-1	UPR-200-W-29	3.93E-05	6.69E-06	2.05E-08	1.73E+00	1.64E+00	8.03E-01	4.40E-05	3.07E-03
200-IS-1	UPR-200-W-32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	7.06E-04	1.01E-04	2.42E-06	2.03E+02	1.92E+02	6.74E+00	3.22E-04	2.36E-02
200-IS-1	UPR-200-W-97	3.06E-06	0.00E+00	2.59E-10	2.18E-02	2.06E-02	1.62E-01	7.76E-06	5.70E-04
200-IS-1	UPR-200-W-98	1.69E-05	1.00E-06	6.21E-09	4.62E+00	4.36E+00	1.77E-01	2.19E-06	2.13E-04
200-OA-1	2101-M-Pond	0.00E+00	1.43E-05	0.00E+00	1.15E-03	1.09E-03	0.00E+00	0.00E+00	0.00E+00
200-OA-1	216-S-10P	1.23E-04	1.81E-05	2.37E-05	3.76E+01	3.55E+01	7.77E-01	1.16E-04	7.78E-03
200-OA-1	216-S-19	0.00E+00	0.00E+00	0.00E+00	1.76E-03	1.66E-03	0.00E+00	0.00E+00	0.00E+00
200-OA-1	216-S-26	0.00E+00	0.00E+00	0.00E+00	2.96E-04	2.80E-04	0.00E+00	0.00E+00	0.00E+00
200-OA-1	216-T-1	8.25E-06	9.63E-07	1.90E-08	2.42E+00	2.29E+00	9.57E-02	3.55E-06	2.68E-04
200-OA-1	216-W-LWC	0.00E+00	5.07E-02	0.00E+00	2.59E-01	2.45E-01	0.00E+00	0.00E+00	1.14E-02
200-PW-1	216-Z-1%2stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-1&2	0.00E+00	0.00E+00	4.98E-09	1.07E-02	1.01E-02	2.38E-04	5.90E-08	6.93E-06
200-PW-1	216-Z-12	0.00E+00	0.00E+00	3.99E-07	7.10E-01	6.71E-01	1.08E-02	3.17E-06	3.55E-04
200-PW-1	216-Z-12stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-12vit	0.00E+00	0.00E+00	3.60E-10	7.32E-03	6.93E-03	7.19E-06	2.24E-09	2.47E-07
200-PW-1	216-Z-18	0.00E+00	0.00E+00	8.43E-08	7.09E-02	6.70E-02	2.06E-03	6.19E-07	6.89E-05
200-PW-1	216-Z-18stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-PW-1	216-Z-1A	0.00E+00	0.00E+00	1.58E-07	1.01E+00	9.57E-01	3.69E-03	1.11E-06	1.24E-04
200-PW-1	216-Z-3	0.00E+00	0.00E+00	8.37E-09	1.63E-01	1.54E-01	2.18E-04	6.15E-08	6.96E-06
200-PW-1	216-Z-9	0.00E+00	0.00E+00	9.24E-08	7.47E-02	7.07E-02	2.17E-03	6.54E-07	7.27E-05
200-PW-1	216-Z-9mined	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	216-Z-9stripped	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-PW-1	241-Z-361	0.00E+00	0.00E+00	3.77E-08	3.61E-01	3.41E-01	1.52E-03	4.03E-07	4.65E-05
200-PW-3	216-A-24	9.20E-04	5.62E-06	5.55E-04	4.01E+02	3.79E+02	2.30E+00	5.31E-04	4.26E-02
200-PW-3	216-A-31	8.50E-04	5.20E-06	5.13E-04	3.71E+02	3.50E+02	2.13E+00	4.91E-04	3.93E-02
200-PW-3	216-A-7	6.85E-03	4.19E-05	4.13E-03	2.99E+03	2.82E+03	1.72E+01	3.95E-03	3.17E-01
200-PW-3	216-A-8	5.52E-03	3.74E-05	3.33E-03	2.41E+03	2.27E+03	1.38E+01	3.19E-03	2.55E-01
200-PW-6	216-Z-10	0.00E+00	0.00E+00	2.37E-07	4.91E+00	4.64E+00	4.83E-03	1.48E-06	1.64E-04
200-PW-6	216-Z-5	0.00E+00	0.00E+00	1.83E-07	3.79E+00	3.59E+00	3.73E-03	1.15E-06	1.27E-04
200-PW-6	216-Z-8	0.00E+00	0.00E+00	2.15E-11	1.72E-05	1.63E-05	5.00E-07	1.51E-10	1.68E-08
200-PW-6	241-Z-8	0.00E+00	0.00E+00	2.15E-11	1.72E-05	1.63E-05	5.00E-07	1.51E-10	1.68E-08
200-SW-2	216-C-9	1.32E-05	5.97E-07	1.06E-07	2.67E-01	2.52E-01	4.16E-02	7.76E-06	5.78E-04
200-SW-2	216-T-4A	2.02E-05	4.36E-04	3.09E-07	5.50E+00	5.19E+00	2.34E-01	8.70E-06	6.56E-04
200-WA-1	200-W-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-9	5.69E-07	6.64E-08	1.31E-09	1.47E-01	1.39E-01	6.60E-03	2.45E-07	1.85E-05
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	0.00E+00	1.36E-01	1.37E-04	8.27E+02	7.83E+02	1.24E+02	2.18E-02	2.84E+00
200-WA-1	216-S-12	4.57E-08	4.01E-04	2.08E-07	1.22E+00	1.15E+00	1.81E-01	3.18E-05	4.14E-03
200-WA-1	216-S-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	2.61E-04	8.15E-03	6.73E-04	8.89E+01	8.40E+01	2.36E+00	1.51E-03	1.09E-01
200-WA-1	216-S-22	5.78E-10	6.39E-06	1.11E-12	1.70E-06	1.60E-06	3.63E-06	5.44E-10	3.64E-08
200-WA-1	216-S-23	2.00E-07	2.93E-08	3.85E-08	5.88E-02	5.55E-02	1.26E-03	1.88E-07	1.26E-05
200-WA-1	216-S-25	0.00E+00	0.00E+00	0.00E+00	2.30E-05	2.18E-05	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-3	1.54E-04	2.18E-05	3.19E-05	4.20E+01	3.97E+01	5.65E-01	9.56E-05	6.44E-03
200-WA-1	216-S-4	0.00E+00	0.00E+00	0.00E+00	4.43E-07	4.19E-07	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-5	2.12E-04	3.18E-05	7.25E-06	5.70E+01	5.38E+01	2.11E+00	2.21E-04	1.49E-02
200-WA-1	216-S-6	2.61E-05	2.81E-03	5.94E-06	1.13E+01	1.07E+01	5.89E-01	1.04E-04	1.18E-02
200-WA-1	216-S-7	0.00E+00	3.51E-01	2.37E-04	9.79E+02	9.26E+02	1.19E+02	2.20E-02	2.82E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-WA-1	216-S-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	5.19E-05	8.83E-06	2.71E-08	2.29E+00	2.16E+00	1.06E+00	5.81E-05	4.06E-03
200-WA-1	216-T-2	2.52E-05	2.93E-06	5.80E-08	6.51E+00	6.15E+00	2.92E-01	1.08E-05	8.16E-04
200-WA-1	216-T-20	1.37E-06	1.52E-07	2.80E-09	3.19E-01	3.02E-01	1.65E-02	5.63E-07	4.29E-05
200-WA-1	216-T-27	1.46E-05	0.00E+00	3.75E-05	4.96E+00	4.68E+00	1.32E-01	8.47E-05	6.09E-03
200-WA-1	216-T-28	4.38E-04	0.00E+00	1.12E-03	1.47E+02	1.39E+02	3.96E+00	2.54E-03	1.83E-01
200-WA-1	216-T-29	1.61E-07	1.88E-08	3.71E-10	4.17E-02	3.94E-02	1.87E-03	6.92E-08	5.22E-06
200-WA-1	216-T-33	8.27E-09	2.93E-05	1.75E-08	2.18E-03	2.06E-03	9.08E-05	3.87E-09	2.96E-07
200-WA-1	216-T-34	2.07E-07	8.21E-03	4.90E-06	1.09E-01	1.03E-01	9.66E-04	1.78E-07	1.45E-05
200-WA-1	216-T-35	0.00E+00	0.00E+00	0.00E+00	7.73E-02	7.31E-02	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-36	7.52E-09	2.99E-04	1.78E-07	2.36E-03	2.23E-03	3.52E-05	6.49E-09	5.26E-07
200-WA-1	216-T-8	2.11E-07	2.46E-08	4.87E-10	5.46E-02	5.16E-02	2.45E-03	9.07E-08	6.85E-06
200-WA-1	216-U-1&2	1.91E-05	2.27E-06	1.61E-08	1.81E+00	1.71E+00	1.88E-01	6.87E-06	5.22E-04
200-WA-1	216-U-12	4.25E-04	1.38E-06	9.32E-05	6.99E+01	6.60E+01	1.47E+00	4.17E-04	1.66E-02
200-WA-1	216-U-13	4.75E-08	5.55E-09	1.10E-10	1.23E-02	1.16E-02	5.51E-04	2.04E-08	1.54E-06
200-WA-1	216-U-14	9.37E-06	8.23E-03	7.41E-05	2.86E+00	2.70E+00	5.41E-02	8.64E-06	2.44E-03
200-WA-1	216-U-15	2.69E-07	3.16E-08	4.82E-10	5.41E-02	5.10E-02	2.95E-03	1.09E-07	8.24E-06
200-WA-1	216-U-16	0.00E+00	7.52E-08	1.23E-12	8.55E-05	8.09E-05	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-3	0.00E+00	0.00E+00	0.00E+00	3.42E-07	3.24E-07	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-4	1.27E-06	1.46E-07	2.89E-09	3.25E-01	3.07E-01	1.82E-02	5.84E-07	4.50E-05
200-WA-1	216-U-4A	2.01E-09	2.34E-10	4.62E-12	7.86E-03	7.43E-03	2.32E-05	8.62E-10	6.50E-08
200-WA-1	216-U-4B	0.00E+00	0.00E+00	0.00E+00	4.45E-04	4.21E-04	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	1.54E-10	2.24E-11	3.65E-09	4.84E-05	4.57E-05	7.20E-07	1.33E-10	1.08E-08
200-WA-1	216-U-8	1.40E-06	4.93E-03	1.30E-09	5.12E-02	4.83E-02	1.38E-02	8.29E-07	5.90E-05
200-WA-1	216-Z-13	0.00E+00	0.00E+00	0.00E+00	3.48E-08	3.29E-08	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-14	0.00E+00	0.00E+00	0.00E+00	3.62E-08	3.43E-08	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-15	0.00E+00	0.00E+00	0.00E+00	3.75E-08	3.55E-08	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-16	0.00E+00	0.00E+00	5.08E-08	4.84E-05	4.58E-05	2.90E-04	1.06E-07	1.11E-05
200-WA-1	216-Z-17	0.00E+00	0.00E+00	1.84E-08	1.75E-05	1.65E-05	1.05E-04	3.81E-08	4.01E-06

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
200-WA-1	216-Z-21	0.00E+00	0.00E+00	0.00E+00	1.11E-06	1.05E-06	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-Z-4	0.00E+00	0.00E+00	1.13E-08	2.35E-01	2.22E-01	2.31E-04	7.09E-08	7.85E-06
200-WA-1	216-Z-6	0.00E+00	0.00E+00	2.41E-08	4.99E-01	4.72E-01	4.91E-04	1.51E-07	1.67E-05
200-WA-1	216-Z-7	9.33E-08	3.71E-03	9.80E-06	1.57E+02	1.49E+02	1.55E-01	4.76E-05	5.26E-03
200-WA-1	UPR-200-W-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	6.36E-11	2.49E-07	6.96E-14	3.03E-06	2.86E-06	6.18E-07	3.88E-11	2.75E-09
200-WA-1	UPR-200-W-19	1.38E-10	1.64E-11	1.16E-13	1.31E-05	1.24E-05	1.36E-06	4.97E-11	3.78E-09
200-WA-1	UPR-200-W-20	0.00E+00	0.00E+00	0.00E+00	3.42E-10	3.23E-10	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-33	2.12E-07	3.04E-08	7.26E-10	6.09E-02	5.75E-02	2.02E-03	9.65E-08	7.09E-06
200-WA-1	UPR-200-W-39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	0.00E+00	0.00E+00	0.00E+00	6.83E-10	6.47E-10	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-95	1.12E-05	1.68E-06	1.57E-07	2.97E+00	2.81E+00	1.16E-01	1.18E-05	7.97E-04
WMA-A-AX	216-A-16	2.68E-09	3.90E-10	6.36E-08	8.43E-04	7.96E-04	1.26E-05	2.32E-09	1.88E-07
WMA-A-AX	216-A-17	1.32E-09	1.92E-10	3.13E-08	4.15E-04	3.92E-04	6.17E-06	1.14E-09	9.23E-08
WMA-A-AX	216-A-23A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	216-A-23B	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	216-A-39	4.53E-05	2.04E-07	2.01E-05	1.45E+01	1.37E+01	8.84E-02	2.04E-05	1.63E-03
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	3.80E-03	1.54E-04	9.49E-04	1.13E+03	1.07E+03	2.18E+01	4.08E-03	3.16E-01
WMA-A-AX	241-A-105	1.28E-01	1.23E-03	4.97E-02	4.05E+04	3.82E+04	3.55E+02	7.03E-02	5.51E+00
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	3.17E-04	1.27E-05	8.03E-05	9.62E+01	9.08E+01	1.85E+00	3.47E-04	2.69E-02
WMA-A-AX	UPR-200-E-119	9.77E-08	3.91E-09	2.48E-08	2.97E-02	2.80E-02	5.71E-04	1.07E-07	8.31E-06
WMA-B-BX-BY	200-E-60	7.67E-11	3.05E-06	1.82E-09	2.41E-05	2.28E-05	3.59E-07	6.62E-11	5.37E-09
WMA-B-BX-BY	241-B-101	2.08E-03	1.93E-04	1.30E-04	1.12E+02	1.06E+02	1.05E+01	3.26E-03	2.45E-01
WMA-B-BX-BY	241-B-105	3.53E-01	3.82E-02	2.58E-02	2.24E+04	2.11E+04	9.92E+01	1.95E-02	1.47E+00
WMA-B-BX-BY	241-B-106	2.57E-03	2.35E-04	2.94E-04	2.37E+02	2.24E+02	2.24E+00	3.82E-04	2.95E-02
WMA-B-BX-BY	241-B-107	2.25E-03	5.12E-03	3.84E-04	6.64E+02	6.27E+02	1.39E+01	2.20E-03	1.65E-01
WMA-B-BX-BY	241-B-110**	7.69E-02	4.41E-03	9.88E-03	7.09E+03	6.70E+03	1.37E+02	3.06E-02	2.30E+00
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	8.90E-04	3.44E-05	4.99E-06	5.96E+00	5.63E+00	7.10E+00	1.93E-03	1.45E-01
WMA-B-BX-BY	241-BX-102*	8.52E-02	2.31E-02	5.28E-03	9.66E+03	9.12E+03	2.69E+02	2.40E-02	1.86E+00
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	2.39E-02	2.59E-03	1.75E-03	1.52E+03	1.44E+03	6.73E+00	1.33E-03	1.00E-01
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	9.03E-04	1.54E-04	4.71E-07	3.99E+01	3.76E+01	1.85E+01	1.01E-03	7.07E-02
WMA-B-BX-BY	UPR-200-E-108	6.80E-05	9.76E-06	2.33E-07	1.96E+01	1.85E+01	6.49E-01	3.10E-05	2.28E-03
WMA-B-BX-BY	UPR-200-E-109	2.30E-05	2.72E-06	5.78E-08	6.51E+00	6.15E+00	2.26E-01	8.24E-06	6.26E-04
WMA-B-BX-BY	UPR-200-E-110	2.00E-04	3.40E-05	1.04E-07	8.81E+00	8.32E+00	4.08E+00	2.24E-04	1.56E-02
WMA-B-BX-BY	UPR-200-E-38	3.83E-02	1.74E-03	2.49E-04	3.07E+02	2.90E+02	1.21E+02	2.24E-02	1.67E+00
WMA-B-BX-BY	UPR-200-E-6	3.99E-05	6.80E-06	2.08E-08	1.76E+00	1.66E+00	8.16E-01	4.47E-05	3.13E-03
WMA-B-BX-BY	UPR-200-E-73	3.18E-05	4.56E-06	1.09E-07	9.15E+00	8.64E+00	3.04E-01	1.45E-05	1.06E-03
WMA-B-BX-BY	UPR-200-E-74	1.61E-10	1.88E-11	3.72E-13	4.17E-05	3.94E-05	1.87E-06	6.92E-11	5.22E-09
WMA-B-BX-BY	UPR-200-E-75	3.99E-05	6.80E-06	2.08E-08	1.76E+00	1.66E+00	8.16E-01	4.47E-05	3.13E-03
WMA-C	216-C-8	0.00E+00	0.00E+00	0.00E+00	2.99E-05	2.83E-05	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-101	1.01E-03	3.91E-05	7.68E-05	2.90E+02	2.74E+02	7.43E+00	1.11E-03	8.26E-02
WMA-C	241-C-104	1.14E-04	6.93E-03	3.11E-06	2.61E+01	2.46E+01	1.17E+00	1.11E-04	8.10E-03
WMA-C	241-C-105	1.33E-01	4.95E-03	2.39E-02	3.59E+04	3.39E+04	7.22E+02	1.24E-01	9.30E+00
WMA-C	241-C-108	2.08E-03	1.30E-03	4.87E-04	6.18E+02	5.84E+02	5.51E+02	1.11E-01	8.73E+00
WMA-C	241-C-110	1.23E-04	1.43E-05	3.03E-07	3.42E+01	3.23E+01	1.25E+00	4.41E-05	3.37E-03
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	2.12E-05	9.55E-08	5.06E-06	6.40E+00	6.04E+00	5.74E+00	1.16E-03	9.09E-02
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	7.65E-07	9.06E-08	1.93E-09	2.17E-01	2.05E-01	7.52E-03	2.75E-07	2.09E-05
WMA-C	UPR-200-E-16	5.08E-07	5.30E-05	2.33E-08	1.43E-01	1.35E-01	5.21E-03	7.13E-07	5.17E-05

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
WMA-C	UPR-200-E-81	2.72E-04	2.38E-02	1.85E-04	8.60E+01	8.12E+01	2.71E+00	7.01E-04	5.38E-02
WMA-C	UPR-200-E-82	2.31E-02	3.70E-04	7.40E-03	5.37E+03	5.07E+03	5.28E+01	1.13E-02	8.80E-01
WMA-S-SX	241-S-104	2.62E-04	3.96E-05	8.10E-05	8.44E+01	7.97E+01	2.75E+00	6.82E-04	4.48E-02
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	2.84E-02	4.12E-03	7.13E-03	8.61E+03	8.13E+03	1.41E+02	2.57E-02	1.71E+00
WMA-S-SX	241-SX-108	1.34E-01	1.96E-02	2.53E-02	3.93E+04	3.71E+04	8.52E+02	1.26E-01	8.45E+00
WMA-S-SX	241-SX-109	3.02E-03	4.39E-04	7.15E-04	9.08E+02	8.58E+02	1.59E+01	2.76E-03	1.84E-01
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	9.54E-03	5.04E-04	1.42E-04	1.70E+02	1.61E+02	3.07E+01	5.79E-03	4.30E-01
WMA-S-SX	241-SX-112	7.80E-02	1.10E-02	1.61E-02	2.12E+04	2.01E+04	2.85E+02	4.83E-02	3.25E+00
WMA-S-SX	241-SX-113	9.59E-03	1.44E-03	1.34E-04	2.54E+03	2.40E+03	9.96E+01	1.01E-02	6.82E-01
WMA-S-SX	241-SX-114	3.11E-03	4.49E-04	8.42E-04	9.51E+02	8.98E+02	1.38E+01	2.75E-03	1.83E-01
WMA-S-SX	241-XS-115	3.26E-02	4.71E-03	8.83E-03	9.97E+03	9.41E+03	1.46E+02	2.93E-02	1.95E+00
WMA-S-SX	316-4	0.00E+00	0.00E+00	0.00E+00	4.44E-09	4.20E-09	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-101	4.89E-02	6.92E-03	1.00E-02	1.33E+04	1.26E+04	1.90E+02	3.22E-02	2.17E+00
WMA-T	241-T-102	5.15E-04	3.49E-05	1.88E-05	2.24E+01	2.12E+01	3.70E+00	9.79E-04	7.29E-02
WMA-T	241-T-103	2.89E-03	1.70E-04	6.54E-05	7.82E+01	7.38E+01	1.06E+01	2.15E-03	1.60E-01
WMA-T	241-T-106	5.11E-01	2.60E-02	1.08E-02	1.19E+04	1.13E+04	1.89E+03	3.85E-01	2.85E+01
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	9.19E-06	1.04E-19	7.79E-10	6.53E-02	6.17E-02	4.88E-01	2.33E-05	1.71E-03
WMA-TX-TY	241-TX-104	7.59E-04	4.51E-05	2.79E-07	2.07E+02	1.96E+02	7.96E+00	9.86E-05	9.55E-03
WMA-TX-TY	241-TX-105	1.98E-02	1.71E-03	2.68E-05	5.51E+03	5.21E+03	2.02E+02	4.65E-03	3.83E-01
WMA-TX-TY	241-TX-114	2.42E-02	2.12E-03	4.31E-03	3.56E+03	3.36E+03	7.86E+01	1.47E-02	1.08E+00
WMA-TX-TY	241-TX-118	6.04E-03	5.30E-04	1.08E-03	8.89E+02	8.40E+02	1.97E+01	3.67E-03	2.70E-01
WMA-TX-TY	241-TY-104	4.84E-03	4.24E-04	8.62E-04	7.12E+02	6.72E+02	1.57E+01	2.94E-03	2.16E-01
WMA-TX-TY	241-TY-105	6.31E-03	7.47E-04	1.59E-05	1.79E+03	1.69E+03	6.20E+01	2.26E-03	1.72E-01
WMA-TX-TY	241-TX-107	4.47E-03	3.92E-04	7.95E-04	6.58E+02	6.22E+02	1.46E+01	2.72E-03	1.99E-01
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	1.25E-02	1.09E-03	2.22E-03	1.83E+03	1.73E+03	4.05E+01	7.57E-03	5.55E-01
WMA-TX-TY	241-TY-106	1.30E-03	1.54E-04	3.27E-06	3.68E+02	3.48E+02	1.28E+01	4.66E-04	3.54E-02
WMA-TX-TY	UPR-200-W-100	9.98E-05	1.70E-05	5.21E-08	4.41E+00	4.16E+00	2.04E+00	1.12E-04	7.82E-03

OPU Name	WIDS-Site-Name	Tin 126 [Ci]	Iodine 129 [Ci]	Cesium 134 [Ci]	Cesium 137 [Ci]	Barium 137 [Ci]	Samarium 151 [Ci]	Europium 152 [Ci]	Europium 154 [Ci]
WMA-TX-TY	UPR-200-W-12	7.75E-07	8.60E-08	1.59E-09	1.81E-01	1.71E-01	9.37E-03	3.19E-07	2.43E-05
WMA-TX-TY	UPR-200-W-127	0.00E+00	0.00E+00	0.00E+00	1.46E-10	1.39E-10	0.00E+00	0.00E+00	0.00E+00
WMA-U	241-U-101	1.65E-02	2.48E-03	2.32E-04	4.38E+03	4.14E+03	1.72E+02	1.74E-02	1.17E+00
WMA-U	241-U-104	3.78E-03	2.25E-04	1.39E-06	1.03E+03	9.77E+02	3.97E+01	4.91E-04	4.76E-02
WMA-U	241-U-110	1.18E-02	1.05E-03	2.07E-03	1.77E+03	1.67E+03	4.00E+01	7.28E-03	5.33E-01
WMA-U	241-U-112	5.89E-02	8.78E-03	8.18E-04	1.56E+04	1.47E+04	6.13E+02	6.15E-02	4.16E+00
WMA-U	UPR-200-W-132	1.73E-04	2.49E-05	5.95E-07	4.99E+01	4.71E+01	1.66E+00	7.90E-05	5.81E-03
WMA-U	UPR-200-W-24	7.04E-06	4.18E-07	2.58E-09	1.92E+00	1.82E+00	7.38E-02	9.14E-07	8.85E-05
* Scaled for UNH solubility of the 1951 o									
** matched leak volume bounds									

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-BC-1	216-B-14	5.71E+00	4.52E-04	2.11E-09	2.19E-03	1.88E-05	1.01E-07	8.54E-10
200-BC-1	216-B-15	4.41E+00	3.49E-04	1.63E-09	1.69E-03	1.46E-05	7.80E-08	6.60E-10
200-BC-1	216-B-16	3.55E+00	2.78E-04	1.30E-09	1.34E-03	3.35E-04	7.60E-08	6.42E-10
200-BC-1	216-B-17	1.67E+00	1.25E-04	5.81E-10	5.92E-04	6.58E-04	5.59E-08	4.71E-10
200-BC-1	216-B-18	5.95E+00	4.71E-04	2.20E-09	2.28E-03	1.96E-05	1.05E-07	8.90E-10
200-BC-1	216-B-19	3.51E+00	2.69E-04	1.25E-09	1.29E-03	8.56E-04	9.62E-08	8.12E-10
200-BC-1	216-B-20	2.67E+00	2.06E-04	9.59E-10	9.85E-04	5.54E-04	6.93E-08	5.85E-10
200-BC-1	216-B-21	3.12E+00	2.46E-04	1.15E-09	1.19E-03	1.39E-04	6.04E-08	5.11E-10
200-BC-1	216-B-22	2.92E+00	2.28E-04	1.06E-09	1.10E-03	3.62E-04	6.59E-08	5.57E-10
200-BC-1	216-B-23	2.78E+00	2.17E-04	1.01E-09	1.04E-03	3.54E-04	6.31E-08	5.33E-10
200-BC-1	216-B-24	3.40E+00	2.69E-04	1.26E-09	1.30E-03	1.12E-05	6.01E-08	5.09E-10
200-BC-1	216-B-25	3.43E+00	2.71E-04	1.27E-09	1.31E-03	1.13E-05	6.06E-08	5.13E-10
200-BC-1	216-B-26	3.31E+00	2.62E-04	1.23E-09	1.27E-03	1.09E-05	5.86E-08	4.96E-10
200-BC-1	216-B-27	3.09E+00	2.44E-04	1.14E-09	1.18E-03	1.02E-05	5.46E-08	4.62E-10
200-BC-1	216-B-28	3.16E+00	2.47E-04	1.15E-09	1.19E-03	3.42E-04	6.93E-08	5.86E-10
200-BC-1	216-B-29	3.26E+00	2.58E-04	1.21E-09	1.25E-03	1.07E-05	5.76E-08	4.88E-10
200-BC-1	216-B-30	2.61E+00	2.00E-04	9.28E-10	9.52E-04	6.77E-04	7.31E-08	6.17E-10
200-BC-1	216-B-31	2.65E+00	2.04E-04	9.46E-10	9.70E-04	6.77E-04	7.40E-08	6.24E-10
200-BC-1	216-B-32	2.53E+00	1.93E-04	8.97E-10	9.20E-04	7.03E-04	7.28E-08	6.14E-10
200-BC-1	216-B-33	2.37E+00	1.80E-04	8.34E-10	8.53E-04	8.21E-04	7.49E-08	6.32E-10
200-BC-1	216-B-34	2.43E+00	1.84E-04	8.52E-10	8.71E-04	8.60E-04	7.74E-08	6.53E-10
200-BC-1	216-B-52	4.34E+00	3.31E-04	1.54E-09	1.57E-03	1.33E-03	1.30E-07	1.10E-09
200-BC-1	216-B-53A	4.81E-03	4.70E-08	6.35E-07	1.89E-06	2.93E-06	3.93E-07	5.03E-07
200-BC-1	216-B-53B	2.79E-03	1.80E-09	3.69E-07	9.82E-07	1.52E-06	2.28E-07	2.92E-07
200-BC-1	216-B-54	2.79E-03	8.56E-08	3.69E-07	1.37E-06	2.12E-06	2.29E-07	2.92E-07
200-BC-1	216-B-58	2.23E-03	3.57E-08	2.95E-07	9.44E-07	1.46E-06	1.83E-07	2.34E-07
200-CB-1	200-E-100	1.52E-07	4.48E-12	1.47E-12	2.50E-11	5.82E-11	1.24E-14	2.28E-14
200-CB-1	200-E-28	0.00E+00	2.48E-12	1.49E-16	1.24E-11	2.86E-11	1.63E-14	1.71E-16
200-CB-1	200-E-55	2.67E-06	1.27E-10	6.31E-16	7.07E-10	1.64E-09	1.28E-13	1.03E-15
200-CB-1	200-E-85	1.18E-06	4.05E-13	4.04E-10	6.68E-12	9.70E-10	8.30E-13	3.10E-12
200-CB-1	200-E-88	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-CB-1	200-E-89	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-CB-1	200-E-90	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-CB-1	200-E-91	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-CB-1	200-E-92	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-CB-1	200-E-93	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-CB-1	200-E-97	2.73E-06	1.29E-10	6.43E-16	7.22E-10	1.67E-09	1.31E-13	1.05E-15
200-CB-1	200-E-98	2.27E-06	1.08E-10	5.36E-16	6.01E-10	1.39E-09	1.09E-13	8.72E-16
200-CB-1	200-E-99	1.52E-07	4.48E-12	1.47E-12	2.50E-11	5.82E-11	1.24E-14	2.28E-14
200-CB-1	216-B-13	4.08E-07	1.93E-11	9.35E-17	1.08E-10	2.50E-10	1.92E-14	1.53E-16
200-CB-1	216-B-4	7.78E-07	3.66E-11	1.76E-16	2.04E-10	4.74E-10	3.44E-14	2.90E-16
200-CB-1	216-B-60	1.05E-08	3.60E-15	3.59E-12	5.94E-14	8.63E-12	7.38E-15	2.76E-14
200-CB-1	UPR-200-E-1	3.38E-03	3.04E-07	1.02E-12	9.10E-07	1.89E-05	7.02E-10	5.88E-12
200-CB-1	UPR-200-E-80	2.01E-05	2.39E-09	8.00E-15	1.39E-08	1.66E-10	6.42E-13	5.38E-15
200-CB-1	UPR-200-E-85	9.33E-02	5.21E-08	2.42E-06	3.09E-07	8.45E-07	1.34E-08	3.75E-08
200-CB-1	UPR-200-E-87	3.39E-04	3.65E-09	1.23E-14	1.55E-07	3.27E-06	1.21E-10	1.02E-12
200-CP-1	200-E-107	2.22E-09	7.63E-16	7.60E-13	1.26E-14	1.83E-12	1.56E-15	5.84E-15
200-CP-1	200-E-62	0.00E+00	1.52E-10	3.31E-15	7.25E-10	1.26E-09	1.16E-12	3.67E-15
200-CP-1	200-E-63	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-64	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-65	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-67	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-69	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-70	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-71	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-72	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-73	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-74	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-75	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-76	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-77	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-78	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-CP-1	200-E-79	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-CP-1	200-E-80	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-CP-1	200-E-81	3.77E-07	1.30E-13	1.29E-10	2.13E-12	3.10E-10	2.65E-13	9.92E-13
200-CP-1	200-E-84	0.00E+00	2.10E-10	4.56E-15	1.00E-09	1.74E-09	1.66E-12	5.05E-15
200-CP-1	216-A-11	0.00E+00	9.29E-11	8.53E-16	4.30E-10	6.54E-10	9.37E-13	8.89E-16
200-CP-1	216-A-12	0.00E+00	9.31E-11	8.38E-16	4.29E-10	6.51E-10	9.73E-13	8.73E-16
200-CP-1	216-A-13	8.27E-09	2.84E-15	2.83E-12	4.69E-14	6.81E-12	5.83E-15	2.18E-14
200-CP-1	216-A-14	8.26E-10	2.84E-16	2.83E-13	4.68E-15	6.80E-13	5.82E-16	2.17E-15
200-CP-1	216-A-32	3.31E-09	1.14E-15	1.13E-12	1.87E-14	2.72E-12	2.33E-15	8.71E-15
200-CP-1	216-A-35	8.26E-09	2.84E-15	2.83E-12	4.68E-14	6.80E-12	5.82E-15	2.18E-14
200-CP-1	UPR-200-E-39	3.83E-06	4.46E-09	6.14E-14	2.16E-08	3.51E-08	2.10E-11	6.46E-14
200-CR-1	UPR-200-W-61	6.86E-03	3.33E-09	1.87E-14	1.43E-08	2.12E-08	7.04E-11	2.01E-14
200-CR-1	UPR-200-W-96	1.82E-08	1.05E-14	7.88E-20	4.45E-14	6.64E-14	1.23E-16	8.27E-20
200-CW-1	216-A-25	4.54E-01	2.15E-04	6.87E-08	1.03E-03	1.71E-03	1.17E-06	4.91E-09
200-CW-1	216-B-3	6.46E-02	3.60E-05	1.01E-06	1.76E-04	3.61E-04	3.14E-07	1.63E-08
200-CW-1	216-S-16P	6.29E-03	3.62E-09	2.71E-14	1.58E-08	2.36E-08	4.31E-11	2.96E-14
200-CW-1	216-S-17	9.09E-03	4.51E-09	2.62E-14	1.93E-08	2.87E-08	9.05E-11	2.81E-14
200-CW-1	216-U-10	8.85E-01	4.15E-05	1.00E-06	1.87E-04	2.78E-04	5.92E-07	8.02E-09
200-CW-3	216-N-6	2.80E-05	2.31E-09	1.05E-14	1.21E-08	2.63E-08	1.83E-12	1.55E-14
200-CW-3	216-N-1	0.00E+00	9.98E-10	4.21E-15	4.71E-09	9.23E-09	5.95E-13	5.02E-15
200-CW-3	216-N-2	2.80E-05	1.32E-09	6.35E-15	7.38E-09	1.71E-08	1.24E-12	1.05E-14
200-CW-3	216-N-3	2.80E-05	1.32E-09	6.36E-15	7.37E-09	1.71E-08	1.24E-12	1.05E-14
200-CW-3	216-N-4	2.80E-05	2.29E-09	1.07E-14	1.19E-08	2.61E-08	1.86E-12	1.57E-14
200-CW-3	216-N-5	2.80E-05	1.32E-09	6.36E-15	7.37E-09	1.71E-08	1.24E-12	1.05E-14
200-CW-3	216-N-7	2.80E-05	1.32E-09	6.36E-15	7.37E-09	1.71E-08	1.24E-12	1.05E-14
200-CW-5	216-Z-11	1.42E-10	3.68E-09	3.86E-13	1.72E-07	2.67E-07	2.04E-10	4.02E-13
200-CW-5	216-Z-19	5.79E-11	3.68E-09	3.86E-13	1.72E-07	2.67E-07	2.04E-10	4.02E-13
200-CW-5	216-Z-1D	4.54E-10	8.66E-09	7.84E-13	3.51E-07	5.47E-07	4.14E-10	8.18E-13
200-CW-5	216-Z-20	0.00E+00	5.28E-10	5.53E-14	2.46E-08	3.82E-08	2.92E-11	5.76E-14
200-DV-1	216-B-11A&B	7.48E-04	5.38E-08	2.45E-13	2.40E-07	7.28E-07	4.20E-11	3.53E-13
200-DV-1	216-B-35	3.91E-01	9.29E-06	6.03E-11	2.81E-05	6.15E-04	4.18E-08	3.53E-10
200-DV-1	216-B-36	7.16E-01	1.70E-05	1.10E-10	5.15E-05	1.12E-03	7.65E-08	6.45E-10
200-DV-1	216-B-37	1.59E+00	3.79E-05	2.46E-10	1.15E-04	2.51E-03	1.70E-07	1.44E-09
200-DV-1	216-B-38	5.28E-01	1.25E-05	8.14E-11	3.80E-05	8.29E-04	5.64E-08	4.76E-10

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-DV-1	216-B-39	5.68E-01	1.35E-05	8.76E-11	4.09E-05	8.93E-04	6.07E-08	5.12E-10
200-DV-1	216-B-40	6.05E-01	1.44E-05	9.33E-11	4.35E-05	9.51E-04	6.47E-08	5.45E-10
200-DV-1	216-B-41	5.31E-01	1.26E-05	8.19E-11	3.82E-05	8.35E-04	5.68E-08	4.79E-10
200-DV-1	216-B-42	8.94E-01	7.08E-05	3.31E-10	3.43E-04	2.95E-06	1.58E-08	1.34E-10
200-DV-1	216-B-43	1.26E+00	1.00E-04	4.68E-10	4.84E-04	4.17E-06	2.23E-08	1.89E-10
200-DV-1	216-B-44	3.34E+00	2.64E-04	1.24E-09	1.28E-03	1.10E-05	5.90E-08	5.00E-10
200-DV-1	216-B-45	2.93E+00	2.32E-04	1.09E-09	1.12E-03	9.67E-06	5.18E-08	4.39E-10
200-DV-1	216-B-46	3.99E+00	3.16E-04	1.48E-09	1.53E-03	1.32E-05	7.06E-08	5.98E-10
200-DV-1	216-B-47	2.35E+00	1.86E-04	8.70E-10	9.01E-04	7.75E-06	4.15E-08	3.52E-10
200-DV-1	216-B-48	2.44E+00	1.93E-04	9.03E-10	9.35E-04	8.04E-06	4.31E-08	3.65E-10
200-DV-1	216-B-49	3.99E+00	3.16E-04	1.48E-09	1.53E-03	1.32E-05	7.06E-08	5.98E-10
200-DV-1	216-B-5	1.83E-01	3.66E-06	1.23E-11	7.38E-05	1.55E-03	5.76E-08	4.82E-10
200-DV-1	216-B-50	1.73E-03	2.10E-08	2.49E-05	1.22E-07	7.86E-05	1.95E-08	7.43E-08
200-DV-1	216-B-57	5.18E-03	6.25E-08	7.47E-05	3.63E-07	2.36E-04	5.84E-08	2.23E-07
200-DV-1	216-B-7A&B	3.55E+00	4.38E-06	2.34E-10	1.60E-04	3.46E-03	1.64E-07	1.39E-09
200-DV-1	216-B-8	1.70E+00	4.31E-05	1.60E-10	3.69E-04	7.83E-03	3.18E-07	2.67E-09
200-DV-1	216-B-9	1.61E-01	2.72E-06	1.13E-11	2.53E-05	5.45E-04	2.51E-08	2.12E-10
200-DV-1	216-S-13	1.13E-02	4.70E-09	3.98E-14	1.83E-07	2.67E-07	2.93E-10	3.80E-13
200-DV-1	216-S-21	4.05E-02	3.50E-08	1.35E-06	1.70E-07	2.56E-06	3.87E-09	1.38E-08
200-DV-1	216-S-9	3.94E-05	1.14E-05	9.87E-11	4.74E-05	6.92E-05	6.20E-08	1.01E-10
200-DV-1	216-T-14	3.71E-01	8.81E-06	5.72E-11	2.67E-05	5.83E-04	3.97E-08	3.35E-10
200-DV-1	216-T-15	3.85E-01	9.13E-06	5.93E-11	2.77E-05	6.04E-04	4.11E-08	3.47E-10
200-DV-1	216-T-16	3.76E-01	8.94E-06	5.80E-11	2.71E-05	5.91E-04	4.02E-08	3.39E-10
200-DV-1	216-T-17	2.90E-01	6.88E-06	4.47E-11	2.08E-05	4.55E-04	3.10E-08	2.61E-10
200-DV-1	216-T-18	5.13E-01	1.07E-05	4.28E-11	3.37E-05	7.78E-04	2.86E-08	2.55E-10
200-DV-1	216-T-19	3.07E-01	2.51E-06	1.48E-11	2.65E-05	5.94E-04	3.56E-08	3.03E-10
200-DV-1	216-T-21	1.71E-01	4.06E-06	2.63E-11	1.23E-05	2.68E-04	1.83E-08	1.54E-10
200-DV-1	216-T-22	5.68E-01	1.35E-05	8.76E-11	4.09E-05	8.93E-04	6.07E-08	5.12E-10
200-DV-1	216-T-23	5.48E-01	1.30E-05	8.46E-11	3.94E-05	8.62E-04	5.86E-08	4.94E-10
200-DV-1	216-T-24	5.68E-01	1.35E-05	8.76E-11	4.09E-05	8.93E-04	6.07E-08	5.12E-10
200-DV-1	216-T-25	1.10E+00	2.62E-05	1.70E-10	7.93E-05	1.73E-03	1.18E-07	9.93E-10
200-DV-1	216-T-26	5.54E+00	1.15E-04	4.62E-10	3.64E-04	8.41E-03	3.09E-07	2.76E-09

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-DV-1	216-T-3	9.82E-02	1.36E-06	4.56E-12	4.32E-05	9.09E-04	3.37E-08	2.82E-10
200-DV-1	216-T-32	7.04E-01	3.33E-06	1.49E-11	1.43E-04	3.10E-03	1.47E-07	1.25E-09
200-DV-1	216-T-5	4.94E-01	4.53E-06	2.67E-11	3.95E-05	8.85E-04	5.30E-08	4.51E-10
200-DV-1	216-T-6	1.38E-01	4.87E-06	1.63E-11	4.26E-05	8.96E-04	3.32E-08	2.78E-10
200-DV-1	216-T-7	7.03E+00	7.11E-05	3.66E-10	7.47E-04	1.65E-02	9.02E-07	7.67E-09
200-EA-1	200-E-103	3.30E-09	1.14E-15	1.13E-12	1.87E-14	2.72E-12	2.33E-15	8.70E-15
200-EA-1	200-E-25	0.00E+00	4.74E-13	1.28E-17	2.31E-12	4.23E-12	2.49E-15	1.42E-17
200-EA-1	200-E-4	0.00E+00	2.11E-13	1.30E-18	9.41E-13	1.34E-12	3.51E-15	1.34E-18
200-EA-1	200-E-41	9.89E-09	1.94E-13	1.50E-13	1.08E-12	2.52E-12	1.01E-15	2.32E-15
200-EA-1	200-E-54	1.66E-07	5.70E-14	5.68E-11	9.39E-13	1.36E-10	1.17E-13	4.36E-13
200-EA-1	200-E-56	1.25E+01	5.48E-08	3.90E-13	2.49E-07	3.67E-07	6.36E-10	4.04E-13
200-EA-1	200-E-57	1.87E+01	8.23E-08	5.86E-13	3.73E-07	5.50E-07	9.54E-10	6.06E-13
200-EA-1	200-E-68	0.00E+00	1.53E-10	3.31E-15	7.28E-10	1.26E-09	1.20E-12	3.67E-15
200-EA-1	200-E-82	0.00E+00	1.55E-10	3.45E-15	7.40E-10	1.29E-09	1.22E-12	3.83E-15
200-EA-1	200-E-94	1.51E-07	4.48E-12	1.44E-12	2.50E-11	5.82E-11	1.22E-14	2.23E-14
200-EA-1	200-E-95	2.73E-06	1.29E-10	6.40E-16	7.21E-10	1.67E-09	1.31E-13	1.04E-15
200-EA-1	216-A-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	2.32E-01	2.59E-04	5.12E-09	1.25E-03	2.19E-03	1.95E-06	6.37E-09
200-EA-1	216-A-15	0.00E+00	9.31E-09	8.38E-14	4.29E-08	6.51E-08	9.73E-11	8.73E-14
200-EA-1	216-A-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	1.38E-01	4.52E-06	2.78E-11	2.01E-05	2.86E-05	7.51E-08	2.86E-11
200-EA-1	216-A-20	0.00E+00	8.58E-12	5.28E-17	3.82E-11	5.44E-11	1.43E-13	5.44E-17
200-EA-1	216-A-21	1.44E-05	3.17E-06	2.59E-11	1.46E-05	2.24E-05	1.92E-08	2.69E-11
200-EA-1	216-A-22	0.00E+00	4.14E-12	2.55E-17	1.85E-11	2.63E-11	6.89E-14	2.63E-17
200-EA-1	216-A-26	3.19E-09	1.10E-15	1.09E-12	1.81E-14	2.63E-12	2.25E-15	8.40E-15
200-EA-1	216-A-26A	8.27E-10	2.84E-16	2.83E-13	4.69E-15	6.81E-13	5.83E-16	2.18E-15
200-EA-1	216-A-27	1.34E-02	1.76E-09	1.78E-06	4.68E-06	7.28E-06	1.10E-06	1.40E-06
200-EA-1	216-A-28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	1.12E-05	1.46E-12	1.48E-09	3.90E-09	6.06E-09	9.13E-10	1.17E-09
200-EA-1	216-A-30	1.81E-04	5.64E-06	6.21E-08	2.70E-05	4.86E-05	4.04E-08	6.36E-10
200-EA-1	216-A-36A	2.70E-03	3.14E-06	4.33E-11	1.52E-05	2.47E-05	1.48E-08	4.55E-11

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-EA-1	216-A-36B	0.00E+00	1.39E-06	8.34E-11	6.97E-06	1.60E-05	9.16E-09	9.58E-11
200-EA-1	216-A-37-1	0.00E+00	2.82E-09	1.08E-13	1.39E-08	2.78E-08	1.61E-11	1.23E-13
200-EA-1	216-A-37-2	0.00E+00	5.40E-07	3.25E-11	2.71E-06	6.24E-06	3.57E-09	3.73E-11
200-EA-1	216-A-4	2.23E-03	2.92E-10	2.95E-07	7.81E-07	1.21E-06	1.83E-07	2.34E-07
200-EA-1	216-A-40	2.70E-07	1.49E-13	6.92E-12	8.84E-13	2.42E-12	3.84E-14	1.07E-13
200-EA-1	216-A-41	1.34E-07	2.63E-10	2.03E-12	1.21E-09	1.86E-09	1.60E-12	1.78E-14
200-EA-1	216-A-45	1.33E-02	9.62E-06	5.92E-10	5.33E-05	1.31E-04	7.45E-08	7.82E-10
200-EA-1	216-A-5	1.52E-01	6.05E-05	3.73E-10	2.70E-04	3.84E-04	1.00E-06	3.84E-10
200-EA-1	216-A-6	1.04E-02	7.11E-06	1.19E-08	3.18E-05	4.57E-05	1.13E-07	1.39E-10
200-EA-1	216-A-9	4.29E-04	6.46E-07	3.97E-12	2.88E-06	4.10E-06	1.07E-08	4.10E-12
200-EA-1	216-B-10A	7.76E-04	3.65E-08	1.76E-13	2.04E-07	4.73E-07	3.43E-11	2.89E-13
200-EA-1	216-B-10B	1.55E-08	5.34E-15	5.32E-12	8.80E-14	1.28E-11	1.09E-14	4.09E-14
200-EA-1	216-B-12	2.53E-02	1.91E-06	1.09E-09	8.54E-06	2.52E-05	2.99E-09	2.93E-11
200-EA-1	216-B-51	6.98E-04	5.53E-08	2.59E-13	2.68E-07	2.30E-09	1.23E-11	1.05E-13
200-EA-1	216-B-55	3.41E-04	1.89E-10	8.76E-09	1.12E-09	3.06E-09	4.86E-11	1.35E-10
200-EA-1	216-B-59	1.36E-07	7.53E-14	3.49E-12	4.46E-13	1.22E-12	1.94E-14	5.39E-14
200-EA-1	216-B-6	4.66E-04	2.19E-08	1.05E-13	1.22E-07	2.84E-07	2.06E-11	1.74E-13
200-EA-1	216-B-62	1.40E+00	3.32E-07	1.96E-05	2.19E-06	4.62E-06	1.30E-07	3.31E-07
200-EA-1	216-B-63	2.63E-05	6.41E-08	6.77E-10	3.13E-07	5.73E-07	3.41E-10	1.24E-11
200-EA-1	216-BY-201	2.48E-02	1.96E-06	9.19E-12	9.51E-06	8.19E-08	4.39E-10	3.71E-12
200-EA-1	216-C-1	8.26E-02	3.63E-10	2.45E-12	1.65E-09	2.44E-09	4.22E-12	2.15E-14
200-EA-1	216-C-10	3.30E-02	1.51E-10	1.08E-15	6.84E-10	1.01E-09	1.72E-12	1.12E-15
200-EA-1	216-C-2	0.00E+00	2.19E-11	3.41E-16	1.03E-10	1.69E-10	1.88E-13	3.70E-16
200-EA-1	216-C-3	1.65E-02	1.49E-09	8.49E-15	6.42E-09	9.52E-09	3.08E-11	9.10E-15
200-EA-1	216-C-4	3.85E-03	1.49E-10	1.98E-15	7.18E-10	1.16E-09	7.73E-13	2.08E-15
200-EA-1	216-C-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	1.04E-02	7.38E-08	6.39E-13	3.06E-07	4.48E-07	4.00E-10	6.56E-13
200-EA-1	216-C-7	0.00E+00	6.96E-13	6.24E-18	3.21E-12	4.87E-12	7.00E-15	6.51E-18
200-EA-1	UPR-200-E-117	1.39E-02	3.29E-09	1.94E-07	2.17E-08	4.57E-08	1.28E-09	3.28E-09
200-EA-1	UPR-200-E-40	2.95E-07	3.43E-10	4.72E-15	1.66E-09	2.70E-09	1.62E-12	4.97E-15
200-EA-1	UPR-200-E-9	2.69E-02	2.13E-06	9.96E-12	1.03E-05	8.87E-08	4.75E-10	4.02E-12
200-IS-1	UPR-200-W-2	6.42E-03	7.62E-07	2.56E-12	4.43E-06	5.10E-08	2.05E-10	1.72E-12

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-IS-1	UPR-200-E-145	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	1.22E-04	2.89E-09	1.88E-14	8.76E-09	1.91E-07	1.30E-11	1.10E-13
200-IS-1	UPR-200-E-7	1.10E-04	8.75E-10	5.16E-15	9.59E-09	2.15E-07	1.29E-11	1.10E-13
200-IS-1	UPR-200-E-77	1.81E-05	2.15E-09	7.21E-15	1.25E-08	1.44E-10	5.79E-13	4.84E-15
200-IS-1	UPR-200-E-78	2.54E-02	1.12E-10	7.96E-16	5.07E-10	7.48E-10	1.30E-12	8.25E-16
200-IS-1	UPR-200-E-79	2.88E-03	2.07E-07	9.42E-13	9.24E-07	2.80E-06	1.62E-10	1.36E-12
200-IS-1	UPR-200-E-84	6.00E-07	2.37E-10	1.46E-15	1.06E-09	1.51E-09	3.95E-12	1.51E-15
200-IS-1	UPR-200-E-86	2.75E+00	8.64E-07	2.85E-05	4.94E-06	9.40E-06	1.91E-07	4.82E-07
200-IS-1	UPR-200-W-102	1.07E-03	2.93E-09	1.73E-14	1.28E-07	2.87E-06	1.72E-10	1.46E-12
200-IS-1	UPR-200-W-130	5.07E-13	2.87E-14	2.95E-19	1.31E-13	2.04E-13	1.56E-16	3.07E-19
200-IS-1	UPR-200-W-131	9.76E-06	7.73E-10	3.62E-15	3.74E-09	3.22E-11	1.73E-13	1.46E-15
200-IS-1	UPR-200-W-135	6.38E-03	2.35E-07	1.38E-12	1.36E-06	1.41E-08	9.15E-11	7.80E-13
200-IS-1	UPR-200-W-21	1.87E-02	6.87E-07	4.05E-12	3.99E-06	4.13E-08	2.68E-10	2.28E-12
200-IS-1	UPR-200-W-28	1.49E-03	1.18E-07	5.52E-13	5.72E-07	4.92E-09	2.64E-11	2.23E-13
200-IS-1	UPR-200-W-29	1.40E-03	3.32E-08	2.15E-13	1.00E-07	2.19E-06	1.49E-10	1.26E-12
200-IS-1	UPR-200-W-32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	1.30E-02	4.77E-07	2.81E-12	2.77E-06	2.87E-08	1.86E-10	1.59E-12
200-IS-1	UPR-200-W-97	3.13E-04	2.87E-09	1.69E-14	2.50E-08	5.60E-07	3.36E-11	2.86E-13
200-IS-1	UPR-200-W-98	1.72E-04	2.05E-08	6.86E-14	1.19E-07	1.37E-09	5.50E-12	4.61E-14
200-OA-1	2101-M-Pond	0.00E+00	2.54E-07	1.71E-12	1.14E-06	1.63E-06	4.14E-09	1.78E-12
200-OA-1	216-S-10P	3.23E-03	8.98E-06	2.31E-10	4.38E-05	7.92E-05	4.68E-08	2.56E-10
200-OA-1	216-S-19	0.00E+00	1.53E-08	2.06E-13	6.95E-08	1.11E-07	9.09E-11	2.19E-13
200-OA-1	216-S-26	0.00E+00	1.31E-09	7.90E-14	6.60E-09	1.52E-08	8.67E-12	9.07E-14
200-OA-1	216-T-1	1.53E-04	9.28E-09	6.77E-14	5.01E-08	1.10E-07	1.79E-11	9.30E-14
200-OA-1	216-W-LWC	2.11E-01	3.92E-08	1.71E-12	1.94E-07	4.02E-07	2.33E-10	1.95E-12
200-PW-1	216-Z-1%2stripped	0.00E+00	1.31E-11	1.34E-16	5.99E-11	9.29E-11	7.09E-14	1.40E-16
200-PW-1	216-Z-1&2	1.19E-08	4.77E-11	3.74E-16	2.20E-10	3.70E-10	1.76E-13	3.98E-16
200-PW-1	216-Z-12	9.68E-07	3.78E-09	3.87E-14	1.73E-08	2.69E-08	2.04E-11	4.04E-14
200-PW-1	216-Z-12stripped	0.00E+00	5.49E-14	3.25E-19	2.59E-13	5.07E-13	1.99E-16	3.82E-19
200-PW-1	216-Z-12vit	8.99E-10	4.21E-12	4.33E-17	1.93E-11	2.99E-11	2.28E-14	4.51E-17
200-PW-1	216-Z-18	2.06E-07	6.09E-10	6.26E-15	2.79E-09	4.33E-09	3.30E-12	6.53E-15
200-PW-1	216-Z-18stripped	0.00E+00	9.74E-13	1.00E-17	4.46E-12	6.92E-12	5.28E-15	1.04E-17

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-PW-1	216-Z-1A	3.90E-07	9.30E-10	8.85E-15	4.27E-09	6.80E-09	4.53E-12	9.27E-15
200-PW-1	216-Z-3	2.03E-08	1.52E-11	6.75E-17	7.16E-11	1.38E-10	2.74E-14	7.97E-17
200-PW-1	216-Z-9	2.17E-07	5.35E-11	2.91E-16	2.53E-10	4.92E-10	1.62E-13	3.43E-16
200-PW-1	216-Z-9mined	0.00E+00	4.31E-14	2.55E-19	2.04E-13	3.98E-13	1.56E-16	3.00E-19
200-PW-1	216-Z-9stripped	0.00E+00	4.31E-14	2.55E-19	2.04E-13	3.98E-13	1.56E-16	3.00E-19
200-PW-1	241-Z-361	8.83E-08	7.00E-10	7.00E-15	3.21E-09	5.05E-09	3.68E-12	7.32E-15
200-PW-3	216-A-24	2.36E-02	1.41E-06	1.93E-11	6.80E-06	1.11E-05	6.73E-09	2.03E-11
200-PW-3	216-A-31	2.18E-02	9.72E-07	7.95E-12	4.49E-06	6.87E-06	5.89E-09	8.27E-12
200-PW-3	216-A-7	1.75E-01	7.83E-06	6.41E-11	3.62E-05	5.53E-05	4.74E-08	6.66E-11
200-PW-3	216-A-8	1.41E-01	8.46E-06	1.16E-10	4.09E-05	6.66E-05	4.08E-08	1.22E-10
200-PW-6	216-Z-10	5.92E-07	5.51E-10	1.85E-15	2.58E-09	4.95E-09	2.61E-13	2.19E-15
200-PW-6	216-Z-5	4.57E-07	4.22E-10	1.42E-15	1.97E-09	3.79E-09	2.00E-13	1.67E-15
200-PW-6	216-Z-8	5.01E-11	2.00E-14	1.11E-19	8.85E-14	1.73E-13	6.78E-17	1.30E-19
200-PW-6	241-Z-8	5.01E-11	2.00E-14	1.11E-19	8.85E-14	1.73E-13	6.78E-17	1.30E-19
200-SW-2	216-C-9	2.67E-04	1.17E-09	6.85E-09	5.27E-09	8.87E-09	4.72E-11	1.06E-10
200-SW-2	216-T-4A	3.76E-04	1.94E-08	1.41E-10	1.06E-07	2.40E-07	2.64E-11	1.24E-12
200-WA-1	200-W-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	0.00E+00	1.01E-11	1.52E-16	4.56E-11	7.39E-11	5.27E-14	1.63E-16
200-WA-1	200-W-9	1.06E-05	4.97E-10	2.39E-15	2.78E-09	6.44E-09	4.67E-13	3.94E-15
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	2.17E-04	1.52E-05	8.55E-11	6.53E-05	9.69E-05	3.21E-07	9.19E-11
200-WA-1	216-S-12	1.51E-06	2.22E-08	1.25E-13	9.52E-08	1.41E-07	4.68E-10	1.34E-13
200-WA-1	216-S-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	3.99E-02	1.05E-05	5.27E-06	6.07E-05	8.86E-05	3.42E-06	4.18E-06
200-WA-1	216-S-22	1.51E-08	8.73E-15	6.52E-20	3.68E-14	5.49E-14	1.02E-16	6.85E-20
200-WA-1	216-S-23	5.23E-06	3.03E-12	2.26E-17	1.28E-11	1.90E-11	3.54E-14	2.37E-17
200-WA-1	216-S-25	0.00E+00	1.31E-08	1.14E-13	5.91E-08	8.99E-08	7.75E-11	1.19E-13
200-WA-1	216-S-3	2.70E-03	2.28E-09	8.98E-08	1.11E-08	1.70E-07	2.58E-10	9.20E-10
200-WA-1	216-S-4	0.00E+00	2.07E-12	1.16E-17	8.88E-12	1.32E-11	4.36E-14	1.25E-17
200-WA-1	216-S-5	6.13E-03	3.04E-09	1.77E-14	1.30E-08	1.93E-08	6.06E-11	1.90E-14
200-WA-1	216-S-6	6.84E-04	3.81E-07	3.18E-12	1.58E-06	2.31E-06	2.59E-09	3.28E-12
200-WA-1	216-S-7	4.20E-04	8.95E-05	7.41E-10	3.72E-04	5.45E-04	6.47E-07	7.63E-10

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-WA-1	216-S-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	1.85E-03	4.52E-08	2.92E-13	1.38E-07	2.91E-06	2.26E-10	1.67E-12
200-WA-1	216-T-2	4.67E-04	2.20E-08	1.06E-13	1.23E-07	2.85E-07	2.06E-11	1.74E-13
200-WA-1	216-T-20	2.50E-05	1.79E-09	8.17E-15	8.01E-09	2.43E-08	1.40E-12	1.18E-14
200-WA-1	216-T-27	2.23E-03	3.59E-07	2.95E-07	2.44E-06	3.74E-06	1.85E-07	2.34E-07
200-WA-1	216-T-28	6.70E-02	2.40E-06	8.86E-06	3.45E-05	5.32E-05	5.49E-06	7.02E-06
200-WA-1	216-T-29	2.99E-06	1.41E-10	6.77E-16	7.86E-10	1.82E-09	1.32E-13	1.12E-15
200-WA-1	216-T-33	1.68E-07	6.59E-12	9.50E-12	3.69E-11	1.08E-10	2.57E-14	7.30E-14
200-WA-1	216-T-34	7.76E-06	3.76E-07	2.66E-09	1.82E-06	2.97E-06	1.78E-09	2.59E-11
200-WA-1	216-T-35	0.00E+00	6.54E-07	9.01E-12	3.16E-06	5.15E-06	3.09E-09	9.47E-12
200-WA-1	216-T-36	2.82E-07	9.71E-14	9.67E-11	1.60E-12	2.33E-10	1.99E-13	7.44E-13
200-WA-1	216-T-8	3.92E-06	1.84E-10	8.87E-16	1.03E-09	2.39E-09	1.73E-13	1.46E-15
200-WA-1	216-U-1&2	3.06E-04	1.10E-03	5.13E-09	5.31E-03	4.57E-05	2.45E-07	2.07E-09
200-WA-1	216-U-12	5.93E-03	5.15E-07	1.83E-03	2.88E-06	8.86E-03	1.36E-06	1.50E-06
200-WA-1	216-U-13	8.83E-07	4.15E-11	2.00E-16	2.32E-10	5.38E-10	3.90E-14	3.29E-16
200-WA-1	216-U-14	3.41E-02	1.60E-06	3.85E-08	7.22E-06	1.07E-05	2.28E-08	3.09E-10
200-WA-1	216-U-15	4.76E-06	5.46E-06	2.56E-11	2.65E-05	2.30E-07	1.22E-09	1.03E-11
200-WA-1	216-U-16	0.00E+00	1.43E-09	8.56E-14	7.15E-09	1.65E-08	9.40E-12	9.83E-14
200-WA-1	216-U-17	0.00E+00	2.79E-09	1.67E-13	1.40E-08	3.22E-08	1.84E-11	1.92E-13
200-WA-1	216-U-3	0.00E+00	1.60E-12	8.97E-18	6.85E-12	1.02E-11	3.37E-14	9.64E-18
200-WA-1	216-U-4	2.68E-05	1.13E-09	5.40E-15	7.74E-09	4.83E-08	2.30E-12	1.93E-14
200-WA-1	216-U-4A	3.72E-08	5.59E-08	6.64E-13	2.66E-07	4.25E-07	2.91E-10	6.96E-13
200-WA-1	216-U-4B	0.00E+00	3.31E-09	3.41E-14	1.55E-08	2.41E-08	2.47E-11	3.57E-14
200-WA-1	216-U-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	5.78E-09	1.99E-15	1.98E-12	3.28E-14	4.76E-12	4.07E-15	1.52E-14
200-WA-1	216-U-8	2.93E-05	2.18E-07	1.34E-12	9.72E-07	1.39E-06	3.61E-09	1.38E-12
200-WA-1	216-Z-13	0.00E+00	4.11E-11	3.21E-15	1.45E-09	2.27E-09	1.69E-12	3.35E-15
200-WA-1	216-Z-14	0.00E+00	4.28E-11	3.38E-15	1.53E-09	2.40E-09	1.78E-12	3.53E-15
200-WA-1	216-Z-15	0.00E+00	4.43E-11	3.37E-15	1.53E-09	2.39E-09	1.77E-12	3.52E-15
200-WA-1	216-Z-16	1.57E-07	8.86E-09	9.11E-14	4.06E-08	6.30E-08	4.81E-11	9.50E-14
200-WA-1	216-Z-17	5.66E-08	3.20E-09	3.29E-14	1.47E-08	2.27E-08	1.74E-11	3.43E-14

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
200-WA-1	216-Z-21	0.00E+00	1.31E-09	1.38E-13	6.13E-08	9.51E-08	7.26E-11	1.43E-13
200-WA-1	216-Z-4	2.83E-08	2.64E-11	8.85E-17	1.23E-10	2.37E-10	1.25E-14	1.05E-16
200-WA-1	216-Z-6	6.02E-08	5.61E-11	1.88E-16	2.63E-10	5.04E-10	2.66E-14	2.23E-16
200-WA-1	216-Z-7	2.24E-05	1.77E-08	1.20E-09	8.26E-08	1.61E-07	1.08E-11	9.30E-12
200-WA-1	UPR-200-W-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	0.00E+00	7.00E-15	7.20E-20	3.21E-14	4.98E-14	3.80E-17	7.50E-20
200-WA-1	UPR-200-W-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	1.35E-09	3.24E-12	1.99E-17	1.45E-11	2.08E-11	5.34E-14	2.06E-17
200-WA-1	UPR-200-W-19	2.21E-09	7.94E-09	3.71E-14	3.84E-08	3.31E-10	1.77E-12	1.50E-14
200-WA-1	UPR-200-W-20	0.00E+00	9.65E-15	8.33E-20	4.00E-14	5.84E-14	5.23E-17	8.54E-20
200-WA-1	UPR-200-W-33	3.90E-06	1.43E-10	8.44E-16	8.31E-10	8.61E-12	5.59E-14	4.76E-16
200-WA-1	UPR-200-W-39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	0.00E+00	1.93E-14	1.67E-19	8.00E-14	1.17E-13	1.05E-16	1.71E-19
200-WA-1	UPR-200-W-95	3.27E-04	1.59E-10	8.94E-16	6.82E-10	1.01E-09	3.35E-12	9.60E-16
WMA-A-AX	216-A-16	1.01E-07	3.47E-14	3.45E-11	5.71E-13	8.30E-11	7.10E-14	2.65E-13
WMA-A-AX	216-A-17	4.96E-08	1.71E-14	1.70E-11	2.81E-13	4.08E-11	3.49E-14	1.31E-13
WMA-A-AX	216-A-23A	0.00E+00	1.44E-14	8.84E-20	6.40E-14	9.11E-14	2.39E-16	9.11E-20
WMA-A-AX	216-A-23B	0.00E+00	1.44E-14	8.84E-20	6.40E-14	9.11E-14	2.39E-16	9.11E-20
WMA-A-AX	216-A-39	9.03E-04	4.79E-10	3.92E-15	2.22E-09	3.39E-09	2.90E-12	4.08E-15
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	1.62E-01	3.98E-08	2.77E-06	2.63E-07	1.67E-06	1.57E-08	4.13E-08
WMA-A-AX	241-A-105	2.90E+00	1.34E-06	1.06E-11	6.14E-06	9.31E-06	1.00E-08	1.10E-11
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	1.39E-02	3.29E-09	1.94E-07	2.17E-08	4.57E-08	1.28E-09	3.28E-09
WMA-A-AX	UPR-200-E-119	4.27E-06	1.02E-12	5.98E-11	6.69E-12	1.41E-11	3.96E-13	1.01E-12
WMA-B-BX-BY	200-E-60	2.88E-09	9.92E-16	9.88E-13	1.63E-14	2.37E-12	2.03E-15	7.59E-15
WMA-B-BX-BY	241-B-101	1.10E-01	4.65E-08	5.10E-05	2.66E-07	1.61E-04	3.99E-08	1.52E-07
WMA-B-BX-BY	241-B-105	7.06E-01	8.45E-06	1.02E-02	4.91E-05	3.21E-02	7.96E-06	3.04E-05
WMA-B-BX-BY	241-B-106	1.48E-02	6.07E-08	6.11E-05	5.39E-07	1.97E-04	4.82E-08	1.83E-07
WMA-B-BX-BY	241-B-107	7.81E-02	8.01E-08	3.62E-04	7.47E-06	3.70E-05	9.94E-07	4.53E-06
WMA-B-BX-BY	241-B-110**	1.08E+00	1.22E-06	8.18E-04	6.85E-06	2.54E-03	7.13E-07	2.63E-06
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	6.54E-02	1.03E-08	3.87E-07	5.87E-08	1.50E-07	2.15E-09	5.97E-09
WMA-B-BX-BY	241-BX-102*	9.29E-01	2.32E-05	2.91E-03	1.56E-04	5.87E-03	4.43E-06	1.90E-05
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	4.79E-02	5.73E-07	6.90E-04	3.33E-06	2.18E-03	5.40E-07	2.06E-06
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	3.21E-02	7.63E-07	4.95E-12	2.31E-06	5.05E-05	3.43E-09	2.90E-11
WMA-B-BX-BY	UPR-200-E-108	1.25E-03	4.60E-08	2.71E-13	2.67E-07	2.77E-09	1.80E-11	1.53E-13
WMA-B-BX-BY	UPR-200-E-109	3.67E-04	2.90E-08	1.36E-13	1.41E-07	1.21E-09	6.48E-12	5.49E-14
WMA-B-BX-BY	UPR-200-E-110	7.10E-03	1.69E-07	1.10E-12	5.11E-07	1.12E-05	7.59E-10	6.40E-12
WMA-B-BX-BY	UPR-200-E-38	7.70E-01	4.30E-07	2.00E-05	2.55E-06	6.97E-06	1.11E-07	3.09E-07
WMA-B-BX-BY	UPR-200-E-6	1.42E-03	3.37E-08	2.19E-13	1.02E-07	2.23E-06	1.52E-10	1.28E-12
WMA-B-BX-BY	UPR-200-E-73	5.85E-04	2.15E-08	1.27E-13	1.25E-07	1.29E-09	8.39E-12	7.15E-14
WMA-B-BX-BY	UPR-200-E-74	2.99E-09	1.41E-13	6.77E-19	7.86E-13	1.82E-12	1.32E-16	1.12E-18
WMA-B-BX-BY	UPR-200-E-75	1.42E-03	3.37E-08	2.19E-13	1.02E-07	2.23E-06	1.52E-10	1.28E-12
WMA-C	216-C-8	0.00E+00	6.07E-14	4.96E-19	2.80E-13	4.29E-13	3.67E-16	5.16E-19
WMA-C	241-C-101	3.78E-02	9.80E-09	8.20E-07	6.02E-08	1.45E-07	2.51E-09	1.04E-08
WMA-C	241-C-104	3.73E-03	8.20E-08	5.10E-13	3.94E-07	3.82E-07	5.56E-11	4.51E-13
WMA-C	241-C-105	4.30E+00	1.38E-06	8.79E-05	8.62E-06	1.91E-05	4.06E-07	1.27E-06
WMA-C	241-C-108	4.62E+00	6.70E-08	3.85E-13	3.13E-07	4.01E-07	2.61E-10	3.62E-13
WMA-C	241-C-110	1.99E-03	1.58E-07	7.33E-13	7.56E-07	4.02E-07	4.87E-11	4.10E-13
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	4.82E-02	2.12E-10	1.51E-15	9.61E-10	1.42E-09	2.46E-12	1.56E-15
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	1.22E-05	9.67E-10	4.53E-15	4.69E-09	4.03E-11	2.16E-13	1.83E-15
WMA-C	UPR-200-E-16	2.25E-05	1.62E-10	1.74E-15	7.91E-10	1.74E-09	2.73E-13	2.16E-15

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
WMA-C	UPR-200-E-81	2.97E-02	3.14E-07	2.43E-03	4.91E-05	2.47E-04	6.66E-06	3.04E-05
WMA-C	UPR-200-E-82	4.61E-01	2.48E-07	3.39E-06	1.24E-06	2.42E-06	1.99E-08	5.24E-08
WMA-S-SX	241-S-104	2.20E-02	7.72E-08	1.12E-12	3.50E-07	8.31E-07	1.16E-10	1.43E-12
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	7.14E-01	4.24E-07	3.36E-12	1.77E-06	2.60E-06	3.88E-09	3.48E-12
WMA-S-SX	241-SX-108	3.51E+00	1.97E-06	1.45E-11	8.30E-06	1.22E-05	2.40E-08	1.51E-11
WMA-S-SX	241-SX-109	7.66E-02	4.49E-08	3.50E-13	1.88E-07	2.76E-07	4.41E-10	3.62E-13
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	1.98E-01	1.10E-07	8.51E-06	7.03E-07	4.66E-06	3.62E-08	1.16E-07
WMA-S-SX	241-SX-112	1.36E+00	1.15E-06	4.53E-05	5.58E-06	8.60E-05	1.30E-07	4.65E-07
WMA-S-SX	241-SX-113	2.80E-01	1.36E-07	7.65E-13	5.84E-07	8.66E-07	2.87E-09	8.22E-13
WMA-S-SX	241-SX-114	7.63E-02	4.66E-08	5.86E-08	1.95E-07	3.87E-07	5.34E-10	6.01E-10
WMA-S-SX	241-XS-115	8.17E-01	5.74E-07	6.09E-07	2.44E-06	4.98E-06	5.68E-09	6.25E-09
WMA-S-SX	316-4	0.00E+00	2.07E-14	1.16E-19	8.89E-14	1.32E-13	4.37E-16	1.25E-19
WMA-T	241-T-101	9.18E-01	1.20E-06	2.74E-05	5.74E-06	5.73E-05	7.95E-08	2.81E-07
WMA-T	241-T-102	3.28E-02	6.32E-09	1.02E-06	5.06E-08	2.08E-07	3.37E-09	1.33E-08
WMA-T	241-T-103	7.29E-02	3.38E-08	3.58E-06	2.36E-07	9.70E-07	1.37E-08	4.84E-08
WMA-T	241-T-106	1.30E+01	6.06E-06	3.24E-04	3.60E-05	2.10E-04	1.56E-06	4.59E-06
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	9.40E-04	8.61E-09	5.08E-14	7.51E-08	1.68E-06	1.01E-10	8.58E-13
WMA-TX-TY	241-TX-104	7.75E-03	9.19E-07	3.08E-12	5.34E-06	6.15E-08	2.47E-10	2.07E-12
WMA-TX-TY	241-TX-105	2.55E-01	2.06E-05	8.01E-11	1.20E-04	1.35E-06	6.07E-09	5.10E-11
WMA-TX-TY	241-TX-114	4.93E-01	7.90E-07	9.34E-05	4.76E-06	2.60E-04	2.25E-07	8.13E-07
WMA-TX-TY	241-TX-118	1.23E-01	1.98E-07	2.34E-05	1.19E-06	6.50E-05	5.63E-08	2.03E-07
WMA-TX-TY	241-TY-104	9.86E-02	1.58E-07	1.87E-05	9.52E-07	5.20E-05	4.51E-08	1.63E-07
WMA-TX-TY	241-TY-105	1.01E-01	7.97E-06	3.73E-11	3.86E-05	3.32E-07	1.78E-09	1.51E-11
WMA-TX-TY	241-TX-107	9.11E-02	1.46E-07	1.72E-05	8.79E-07	4.80E-05	4.16E-08	1.50E-07
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	2.54E-01	4.07E-07	4.82E-05	2.45E-06	1.34E-04	1.16E-07	4.19E-07
WMA-TX-TY	241-TY-106	2.07E-02	1.64E-06	7.68E-12	7.95E-06	6.84E-08	3.67E-10	3.10E-12
WMA-TX-TY	UPR-200-W-100	3.55E-03	8.43E-08	5.48E-13	2.55E-07	5.58E-06	3.80E-10	3.20E-12

OPU Name	WIDS-Site-Name	Europium 155 [Ci]	Radium 226 [Ci]	Radium 228 [Ci]	Actinium 227 [Ci]	Protactinium 231 [Ci]	Thorium 229 [Ci]	Thorium 232 [Ci]
WMA-TX-TY	UPR-200-W-12	1.41E-05	1.02E-09	4.63E-15	4.54E-09	1.38E-08	7.94E-13	6.68E-15
WMA-TX-TY	UPR-200-W-127	0.00E+00	4.14E-15	3.57E-20	1.71E-14	2.50E-14	2.24E-17	3.66E-20
WMA-U	241-U-101	4.82E-01	2.34E-07	1.32E-12	1.01E-06	1.49E-06	4.95E-09	1.42E-12
WMA-U	241-U-104	3.86E-02	4.58E-06	1.54E-11	2.66E-05	3.07E-07	1.23E-09	1.03E-11
WMA-U	241-U-110	2.43E-01	3.90E-07	4.49E-05	2.33E-06	1.25E-04	1.08E-07	3.91E-07
WMA-U	241-U-112	1.71E+00	1.63E-06	7.41E-12	7.17E-06	2.78E-05	1.84E-08	1.31E-11
WMA-U	UPR-200-W-132	3.19E-03	1.17E-07	6.92E-13	6.81E-07	7.05E-09	4.58E-11	3.90E-13
WMA-U	UPR-200-W-24	7.18E-05	8.52E-09	2.86E-14	4.95E-08	5.70E-10	2.29E-12	1.92E-14
* Scaled for UNH solubility of the 1951 o								
** matched leak volume bounds								

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-BC-1	216-B-14	1.10E-06	8.96E-08	8.82E-02	3.94E-03	1.01E-03	8.99E-02	2.69E+02
200-BC-1	216-B-15	8.50E-07	6.93E-08	6.82E-02	3.04E-03	7.80E-04	6.95E-02	2.08E+02
200-BC-1	216-B-16	7.19E-07	5.82E-08	5.69E-02	2.54E-03	6.53E-04	5.80E-02	1.74E+02
200-BC-1	216-B-17	3.89E-07	3.10E-08	2.97E-02	1.33E-03	3.44E-04	3.03E-02	9.08E+01
200-BC-1	216-B-18	1.15E-06	9.34E-08	9.19E-02	4.10E-03	1.05E-03	9.37E-02	2.81E+02
200-BC-1	216-B-19	7.64E-07	6.14E-08	5.94E-02	2.65E-03	6.84E-04	6.05E-02	1.81E+02
200-BC-1	216-B-20	5.71E-07	4.60E-08	4.46E-02	1.99E-03	5.13E-04	4.54E-02	1.36E+02
200-BC-1	216-B-21	6.15E-07	5.00E-08	4.90E-02	2.19E-03	5.61E-04	4.99E-02	1.50E+02
200-BC-1	216-B-22	6.00E-07	4.85E-08	4.73E-02	2.11E-03	5.43E-04	4.82E-02	1.45E+02
200-BC-1	216-B-23	5.71E-07	4.62E-08	4.50E-02	2.01E-03	5.17E-04	4.59E-02	1.38E+02
200-BC-1	216-B-24	6.55E-07	5.34E-08	5.25E-02	2.34E-03	6.01E-04	5.35E-02	1.60E+02
200-BC-1	216-B-25	6.61E-07	5.38E-08	5.30E-02	2.36E-03	6.06E-04	5.40E-02	1.62E+02
200-BC-1	216-B-26	6.39E-07	5.21E-08	5.12E-02	2.29E-03	5.86E-04	5.22E-02	1.56E+02
200-BC-1	216-B-27	5.95E-07	4.85E-08	4.77E-02	2.13E-03	5.45E-04	4.86E-02	1.46E+02
200-BC-1	216-B-28	6.44E-07	5.21E-08	5.09E-02	2.27E-03	5.84E-04	5.19E-02	1.55E+02
200-BC-1	216-B-29	6.28E-07	5.12E-08	5.03E-02	2.25E-03	5.76E-04	5.13E-02	1.54E+02
200-BC-1	216-B-30	5.71E-07	4.59E-08	4.43E-02	1.98E-03	5.11E-04	4.52E-02	1.35E+02
200-BC-1	216-B-31	5.81E-07	4.67E-08	4.51E-02	2.01E-03	5.20E-04	4.60E-02	1.38E+02
200-BC-1	216-B-32	5.59E-07	4.49E-08	4.33E-02	1.93E-03	5.00E-04	4.41E-02	1.32E+02
200-BC-1	216-B-33	5.42E-07	4.33E-08	4.17E-02	1.86E-03	4.82E-04	4.25E-02	1.27E+02
200-BC-1	216-B-34	5.56E-07	4.45E-08	4.27E-02	1.91E-03	4.94E-04	4.36E-02	1.31E+02
200-BC-1	216-B-52	9.73E-07	7.80E-08	7.52E-02	3.35E-03	8.68E-04	7.66E-02	2.30E+02
200-BC-1	216-B-53A	3.07E-05	1.81E-03	1.11E-03	4.57E-05	3.08E-05	1.04E-03	3.11E+00
200-BC-1	216-B-53B	1.78E-05	1.05E-03	1.03E-04	4.08E-06	4.00E-06	7.81E-05	2.35E-01
200-BC-1	216-B-54	1.79E-05	1.05E-03	1.87E-03	7.77E-05	4.93E-05	1.80E-03	5.39E+00
200-BC-1	216-B-58	1.43E-05	8.44E-04	8.04E-04	3.34E-05	2.18E-05	7.67E-04	2.30E+00
200-CB-1	200-E-100	6.39E-13	2.42E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-28	3.49E-11	1.11E-11	1.05E-07	4.04E-09	1.02E-08	7.27E-08	2.18E-04
200-CB-1	200-E-55	1.46E-11	5.89E-12	5.90E-07	2.62E-08	8.25E-09	5.94E-07	1.78E-03
200-CB-1	200-E-85	9.89E-11	6.06E-09	7.89E-10	3.08E-11	3.22E-11	6.65E-10	2.00E-06
200-CB-1	200-E-88	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-89	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-CB-1	200-E-90	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-91	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-92	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-93	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	200-E-97	1.47E-11	5.91E-12	6.02E-07	2.67E-08	8.40E-09	6.06E-07	1.82E-03
200-CB-1	200-E-98	1.22E-11	4.89E-12	5.01E-07	2.23E-08	6.97E-09	5.05E-07	1.51E-03
200-CB-1	200-E-99	6.39E-13	2.42E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-CB-1	216-B-13	1.44E-12	6.32E-13	8.77E-08	3.91E-09	1.06E-09	8.91E-08	2.67E-04
200-CB-1	216-B-4	2.04E-12	1.66E-13	1.63E-07	7.27E-09	1.86E-09	1.66E-07	4.98E-04
200-CB-1	216-B-60	8.79E-13	5.39E-11	7.02E-12	2.74E-13	2.86E-13	5.92E-12	1.78E-08
200-CB-1	UPR-200-E-1	1.87E-09	1.66E-10	2.07E-04	9.36E-06	1.77E-06	2.11E-04	6.33E-01
200-CB-1	UPR-200-E-80	1.05E-10	9.30E-12	1.20E-05	5.42E-07	1.03E-07	1.22E-05	3.66E-02
200-CB-1	UPR-200-E-85	6.43E-07	3.97E-05	2.73E-05	1.14E-06	7.41E-07	2.56E-05	7.67E-02
200-CB-1	UPR-200-E-87	1.68E-12	1.49E-13	1.92E-07	8.66E-09	1.64E-09	1.95E-07	5.85E-04
200-CP-1	200-E-107	1.86E-13	1.14E-11	1.49E-12	5.79E-14	6.06E-14	1.25E-12	3.76E-09
200-CP-1	200-E-62	9.40E-10	5.89E-10	3.74E-06	1.54E-07	2.29E-07	2.96E-06	8.87E-03
200-CP-1	200-E-63	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-64	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-65	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-67	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-69	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-70	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-71	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-72	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-73	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-74	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-75	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-76	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-77	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-78	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-CP-1	200-E-79	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-CP-1	200-E-80	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-CP-1	200-E-81	3.16E-11	1.94E-09	2.52E-10	9.84E-12	1.03E-11	2.13E-10	6.38E-07
200-CP-1	200-E-84	1.29E-09	8.42E-10	5.15E-06	2.12E-07	3.14E-07	4.07E-06	1.22E-02
200-CP-1	216-A-11	2.61E-10	4.45E-10	1.76E-06	7.49E-08	5.75E-08	1.61E-06	4.82E-03
200-CP-1	216-A-12	2.53E-10	4.62E-10	1.75E-06	7.44E-08	5.62E-08	1.61E-06	4.82E-03
200-CP-1	216-A-13	6.94E-13	4.26E-11	5.54E-12	2.16E-13	2.26E-13	4.67E-12	1.40E-08
200-CP-1	216-A-14	6.93E-14	4.25E-12	5.53E-13	2.16E-14	2.26E-14	4.67E-13	1.40E-09
200-CP-1	216-A-32	2.78E-13	1.70E-11	2.22E-12	8.64E-14	9.04E-14	1.87E-12	5.61E-09
200-CP-1	216-A-35	6.93E-13	4.25E-11	5.54E-12	2.16E-13	2.26E-13	4.67E-12	1.40E-08
200-CP-1	UPR-200-E-39	2.61E-08	9.50E-09	9.11E-05	3.93E-06	4.48E-06	6.86E-05	2.06E-01
200-CR-1	UPR-200-W-61	3.42E-10	1.68E-09	8.40E-06	3.61E-07	1.74E-07	8.60E-06	2.58E-02
200-CR-1	UPR-200-W-96	1.08E-15	3.65E-15	2.04E-11	8.37E-13	4.88E-13	1.82E-11	5.46E-08
200-CW-1	216-A-25	1.10E-03	5.85E-04	4.96E+00	2.07E-01	2.50E-01	4.06E+00	1.22E+04
200-CW-1	216-B-3	3.51E-04	1.93E-04	1.24E+00	4.89E-02	1.01E-01	9.28E-01	2.79E+03
200-CW-1	216-S-16P	5.31E-07	4.29E-08	3.48E-02	1.54E-03	4.73E-04	3.55E-02	1.06E+02
200-CW-1	216-S-17	1.78E-08	3.66E-09	1.14E-03	5.07E-05	1.56E-05	1.17E-03	3.50E+00
200-CW-1	216-U-10	7.49E-05	2.97E-04	7.33E-01	3.12E-02	2.03E-02	7.18E-01	2.15E+03
200-CW-3	216-N-6	2.20E-09	1.83E-10	1.95E-04	8.72E-06	2.05E-06	1.98E-04	5.95E-01
200-CW-3	216-N-1	2.13E-09	1.77E-10	1.89E-04	8.47E-06	1.99E-06	1.93E-04	5.77E-01
200-CW-3	216-N-2	8.59E-11	7.08E-12	7.30E-06	3.26E-07	7.93E-08	7.43E-06	2.23E-02
200-CW-3	216-N-3	9.52E-11	7.68E-12	7.29E-06	3.25E-07	8.66E-08	7.43E-06	2.23E-02
200-CW-3	216-N-4	2.35E-09	1.93E-10	1.95E-04	8.70E-06	2.17E-06	1.98E-04	5.95E-01
200-CW-3	216-N-5	9.52E-11	7.68E-12	7.29E-06	3.25E-07	8.66E-08	7.43E-06	2.23E-02
200-CW-3	216-N-7	9.52E-11	7.68E-12	7.29E-06	3.25E-07	8.66E-08	7.43E-06	2.23E-02
200-CW-5	216-Z-11	1.11E-07	9.59E-08	6.92E-04	2.89E-05	2.45E-05	5.86E-04	1.76E+00
200-CW-5	216-Z-19	1.11E-07	9.59E-08	6.92E-04	2.89E-05	2.45E-05	5.86E-04	1.76E+00
200-CW-5	216-Z-1D	2.26E-07	1.95E-07	1.59E-03	6.70E-05	5.21E-05	1.38E-03	4.15E+00
200-CW-5	216-Z-20	1.59E-08	1.37E-08	9.92E-05	4.14E-06	3.52E-06	8.40E-05	2.52E-01
200-DV-1	216-B-11A&B	2.13E-10	1.66E-11	1.38E-05	6.11E-07	1.83E-07	1.41E-05	4.21E-02
200-DV-1	216-B-35	1.95E-07	1.47E-08	1.07E-02	4.73E-04	1.59E-04	1.10E-02	3.29E+01
200-DV-1	216-B-36	3.56E-07	2.69E-08	1.96E-02	8.66E-04	2.91E-04	2.01E-02	6.01E+01
200-DV-1	216-B-37	7.93E-07	5.99E-08	4.38E-02	1.93E-03	6.49E-04	4.47E-02	1.34E+02
200-DV-1	216-B-38	2.62E-07	1.98E-08	1.45E-02	6.38E-04	2.15E-04	1.48E-02	4.43E+01

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-DV-1	216-B-39	2.83E-07	2.14E-08	1.56E-02	6.87E-04	2.31E-04	1.59E-02	4.77E+01
200-DV-1	216-B-40	3.01E-07	2.27E-08	1.66E-02	7.32E-04	2.46E-04	1.70E-02	5.08E+01
200-DV-1	216-B-41	2.64E-07	2.00E-08	1.46E-02	6.42E-04	2.16E-04	1.49E-02	4.46E+01
200-DV-1	216-B-42	1.72E-07	1.40E-08	1.38E-02	6.17E-04	1.58E-04	1.41E-02	4.22E+01
200-DV-1	216-B-43	2.44E-07	1.98E-08	1.95E-02	8.71E-04	2.23E-04	1.99E-02	5.96E+01
200-DV-1	216-B-44	6.43E-07	5.24E-08	5.16E-02	2.30E-03	5.90E-04	5.26E-02	1.58E+02
200-DV-1	216-B-45	5.65E-07	4.61E-08	4.53E-02	2.02E-03	5.18E-04	4.62E-02	1.38E+02
200-DV-1	216-B-46	7.70E-07	6.27E-08	6.17E-02	2.75E-03	7.06E-04	6.29E-02	1.88E+02
200-DV-1	216-B-47	4.53E-07	3.69E-08	3.63E-02	1.62E-03	4.15E-04	3.70E-02	1.11E+02
200-DV-1	216-B-48	4.70E-07	3.83E-08	3.77E-02	1.68E-03	4.31E-04	3.84E-02	1.15E+02
200-DV-1	216-B-49	7.70E-07	6.27E-08	6.17E-02	2.75E-03	7.06E-04	6.29E-02	1.88E+02
200-DV-1	216-B-5	3.02E-08	2.68E-09	3.46E-03	1.56E-04	2.95E-05	3.52E-03	1.05E+01
200-DV-1	216-B-50	1.06E-06	6.43E-05	1.15E-05	4.53E-07	2.66E-07	9.60E-06	2.88E-02
200-DV-1	216-B-57	3.19E-06	1.93E-04	2.38E-05	9.26E-07	5.66E-07	1.98E-05	5.95E-02
200-DV-1	216-B-7A&B	3.06E-08	5.80E-08	1.65E-03	7.34E-05	2.06E-05	1.68E-03	5.04E+00
200-DV-1	216-B-8	6.16E-07	5.30E-08	6.28E-02	2.82E-03	5.89E-04	6.39E-02	1.91E+02
200-DV-1	216-B-9	4.47E-08	3.74E-09	4.04E-03	1.81E-04	4.18E-05	4.11E-03	1.23E+01
200-DV-1	216-S-13	4.41E-08	2.05E-07	1.02E-03	4.34E-05	2.17E-05	1.02E-03	3.05E+00
200-DV-1	216-S-21	1.92E-07	1.13E-05	3.59E-05	1.43E-06	9.37E-07	2.95E-05	8.85E-02
200-DV-1	216-S-9	1.00E-05	2.85E-05	1.31E-01	4.98E-03	3.80E-03	9.18E-02	2.76E+02
200-DV-1	216-T-14	1.85E-07	1.39E-08	1.02E-02	4.49E-04	1.51E-04	1.04E-02	3.12E+01
200-DV-1	216-T-15	1.91E-07	1.44E-08	1.06E-02	4.65E-04	1.56E-04	1.08E-02	3.23E+01
200-DV-1	216-T-16	1.87E-07	1.41E-08	1.03E-02	4.55E-04	1.53E-04	1.06E-02	3.16E+01
200-DV-1	216-T-17	1.44E-07	1.09E-08	7.95E-03	3.50E-04	1.18E-04	8.12E-03	2.43E+01
200-DV-1	216-T-18	9.56E-08	7.12E-09	9.59E-03	4.32E-04	8.62E-05	9.75E-03	2.92E+01
200-DV-1	216-T-19	6.87E-08	2.03E-08	4.22E-03	1.86E-04	5.84E-05	4.29E-03	1.28E+01
200-DV-1	216-T-21	8.50E-08	6.42E-09	4.69E-03	2.07E-04	6.95E-05	4.79E-03	1.44E+01
200-DV-1	216-T-22	2.83E-07	2.14E-08	1.56E-02	6.87E-04	2.31E-04	1.59E-02	4.77E+01
200-DV-1	216-T-23	2.73E-07	2.06E-08	1.51E-02	6.63E-04	2.23E-04	1.54E-02	4.61E+01
200-DV-1	216-T-24	2.83E-07	2.14E-08	1.56E-02	6.87E-04	2.31E-04	1.59E-02	4.77E+01
200-DV-1	216-T-25	5.48E-07	4.14E-08	3.03E-02	1.33E-03	4.48E-04	3.09E-02	9.26E+01
200-DV-1	216-T-26	1.03E-06	7.69E-08	1.04E-01	4.66E-03	9.31E-04	1.05E-01	3.16E+02

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-DV-1	216-T-3	5.75E-09	5.09E-10	6.58E-04	2.97E-05	5.62E-06	6.69E-04	2.01E+00
200-DV-1	216-T-32	2.31E-09	1.90E-10	1.93E-04	8.64E-06	2.13E-06	1.97E-04	5.90E-01
200-DV-1	216-T-5	1.21E-07	9.49E-09	7.94E-03	3.51E-04	1.08E-04	8.10E-03	2.43E+01
200-DV-1	216-T-6	5.97E-08	5.28E-09	6.83E-03	3.08E-04	5.83E-05	6.95E-03	2.08E+01
200-DV-1	216-T-7	1.50E-06	1.21E-07	1.11E-01	4.94E-03	1.36E-03	1.13E-01	3.40E+02
200-EA-1	200-E-103	2.77E-13	1.70E-11	2.21E-12	8.63E-14	9.03E-14	1.87E-12	5.60E-09
200-EA-1	200-E-25	3.88E-12	1.32E-12	1.27E-08	5.19E-10	8.95E-10	9.17E-09	2.75E-05
200-EA-1	200-E-4	2.38E-13	1.67E-12	3.47E-09	1.49E-10	7.67E-11	3.56E-09	1.07E-05
200-EA-1	200-E-41	5.04E-14	2.46E-12	8.50E-10	3.79E-11	9.75E-12	8.66E-10	2.59E-06
200-EA-1	200-E-54	1.39E-11	8.53E-10	1.11E-10	4.33E-12	4.53E-12	9.36E-11	2.81E-07
200-EA-1	200-E-56	5.72E-08	2.42E-07	7.81E-04	3.30E-05	1.87E-05	7.81E-04	2.34E+00
200-EA-1	200-E-57	8.59E-08	3.62E-07	1.17E-03	4.95E-05	2.80E-05	1.17E-03	3.51E+00
200-EA-1	200-E-68	9.39E-10	6.12E-10	3.74E-06	1.54E-07	2.28E-07	2.96E-06	8.87E-03
200-EA-1	200-E-82	9.73E-10	6.22E-10	3.84E-06	1.58E-07	2.38E-07	3.03E-06	9.08E-03
200-EA-1	200-E-94	6.30E-13	2.36E-11	1.98E-08	8.85E-10	2.27E-10	2.02E-08	6.06E-05
200-EA-1	200-E-95	1.39E-11	5.66E-12	5.99E-07	2.66E-08	8.17E-09	6.05E-07	1.81E-03
200-EA-1	216-A-1	6.80E-08	4.79E-07	9.93E-04	4.25E-05	2.19E-05	1.02E-03	3.05E+00
200-EA-1	216-A-10	1.36E-05	2.80E-05	1.26E-01	5.23E-03	4.31E-03	1.19E-01	3.58E+02
200-EA-1	216-A-15	2.53E-08	4.62E-08	1.75E-04	7.44E-06	5.62E-06	1.61E-04	4.82E-01
200-EA-1	216-A-18	3.37E-07	2.37E-06	4.93E-03	2.11E-04	1.09E-04	5.05E-03	1.51E+01
200-EA-1	216-A-19	7.60E-07	5.35E-06	1.11E-02	4.75E-04	2.45E-04	1.14E-02	3.41E+01
200-EA-1	216-A-2	5.09E-06	3.58E-05	7.43E-02	3.18E-03	1.64E-03	7.62E-02	2.28E+02
200-EA-1	216-A-20	9.33E-08	6.57E-07	1.36E-03	5.83E-05	3.01E-05	1.40E-03	4.19E+00
200-EA-1	216-A-21	5.19E-06	9.42E-06	6.65E-02	2.78E-03	1.71E-03	6.49E-02	1.95E+02
200-EA-1	216-A-22	2.29E-08	1.83E-09	1.50E-03	6.66E-05	2.04E-05	1.54E-03	4.60E+00
200-EA-1	216-A-26	2.68E-13	1.64E-11	2.14E-12	8.33E-14	8.71E-14	1.80E-12	5.41E-09
200-EA-1	216-A-26A	6.94E-14	4.26E-12	5.54E-13	2.16E-14	2.26E-14	4.67E-13	1.40E-09
200-EA-1	216-A-27	8.54E-05	5.06E-03	3.69E-04	1.42E-05	1.61E-05	2.48E-04	7.44E-01
200-EA-1	216-A-28	1.30E-07	1.02E-08	8.50E-03	3.76E-04	1.15E-04	8.67E-03	2.60E+01
200-EA-1	216-A-3	1.32E-05	5.25E-06	8.64E-01	3.82E-02	1.17E-02	8.81E-01	2.64E+03
200-EA-1	216-A-30	3.78E-05	2.22E-05	1.50E-01	6.09E-03	9.78E-03	1.18E-01	3.54E+02
200-EA-1	216-A-36A	1.84E-05	6.69E-06	6.41E-02	2.77E-03	3.15E-03	4.83E-02	1.45E+02

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-EA-1	216-A-36B	1.95E-05	6.19E-06	5.91E-02	2.27E-03	5.71E-03	4.07E-02	1.22E+02
200-EA-1	216-A-37-1	2.88E-08	9.51E-09	9.09E-05	3.61E-06	7.49E-06	6.44E-05	1.93E-01
200-EA-1	216-A-37-2	7.60E-06	2.41E-06	2.30E-02	8.82E-04	2.22E-03	1.59E-02	4.76E+01
200-EA-1	216-A-4	4.10E-05	8.46E-04	1.76E+00	7.78E-02	2.39E-02	1.79E+00	5.38E+03
200-EA-1	216-A-40	1.83E-12	1.13E-10	7.90E-11	3.30E-12	2.15E-12	7.40E-11	2.22E-07
200-EA-1	216-A-41	9.55E-12	4.69E-11	1.16E-07	4.85E-09	2.98E-09	1.13E-07	3.40E-04
200-EA-1	216-A-45	1.23E-06	3.88E-07	3.77E-03	1.46E-04	3.66E-04	2.60E-03	7.82E+00
200-EA-1	216-A-5	4.42E-06	3.11E-05	6.45E-02	2.76E-03	1.43E-03	6.62E-02	1.98E+02
200-EA-1	216-A-6	5.06E-06	2.34E-05	5.59E-02	2.39E-03	1.40E-03	5.56E-02	1.66E+02
200-EA-1	216-A-9	7.28E-07	5.13E-06	1.06E-02	4.55E-04	2.35E-04	1.09E-02	3.27E+01
200-EA-1	216-B-10A	2.36E-08	1.86E-09	1.58E-03	7.00E-05	2.11E-05	1.61E-03	4.83E+00
200-EA-1	216-B-10B	1.30E-12	7.99E-11	1.04E-11	4.05E-13	4.24E-13	8.77E-12	2.63E-08
200-EA-1	216-B-12	7.48E-05	6.63E-06	4.90E+00	2.17E-01	6.66E-02	5.00E+00	1.50E+04
200-EA-1	216-B-51	1.35E-10	1.10E-11	1.08E-05	4.81E-07	1.23E-07	1.10E-05	3.30E-02
200-EA-1	216-B-55	2.32E-09	1.43E-07	9.99E-08	4.17E-09	2.72E-09	9.36E-08	2.81E-04
200-EA-1	216-B-59	9.25E-13	5.72E-11	3.98E-11	1.66E-12	1.08E-12	3.73E-11	1.12E-07
200-EA-1	216-B-6	1.22E-09	9.95E-11	9.77E-05	4.36E-06	1.12E-06	9.95E-05	2.98E-01
200-EA-1	216-B-62	2.17E-06	1.33E-04	3.46E-04	1.46E-05	8.32E-06	3.45E-04	1.03E+00
200-EA-1	216-B-63	1.39E-06	2.59E-07	5.84E-02	2.58E-03	8.92E-04	5.91E-02	1.77E+02
200-EA-1	216-BY-201	4.78E-09	3.90E-10	3.83E-04	1.71E-05	4.38E-06	3.91E-04	1.17E+00
200-EA-1	216-C-1	1.07E-05	5.85E-05	2.36E-01	1.02E-02	4.94E-03	2.42E-01	7.26E+02
200-EA-1	216-C-10	1.61E-10	6.56E-10	2.18E-06	9.22E-08	5.23E-08	2.18E-06	6.54E-03
200-EA-1	216-C-2	1.05E-10	9.16E-11	4.73E-07	1.98E-08	2.36E-08	3.92E-07	1.18E-03
200-EA-1	216-C-3	2.44E-08	1.55E-08	1.48E-03	6.56E-05	2.07E-05	1.52E-03	4.54E+00
200-EA-1	216-C-4	1.41E-10	2.88E-10	1.12E-06	4.77E-08	3.38E-08	1.06E-06	3.16E-03
200-EA-1	216-C-5	2.69E-08	1.89E-07	3.93E-04	1.68E-05	8.67E-06	4.03E-04	1.21E+00
200-EA-1	216-C-6	6.48E-08	1.84E-07	8.47E-04	3.21E-05	2.45E-05	5.92E-04	1.78E+00
200-EA-1	216-C-7	1.85E-12	3.33E-12	1.32E-08	5.61E-10	4.19E-10	1.22E-08	3.65E-05
200-EA-1	UPR-200-E-117	2.15E-08	1.32E-06	3.43E-06	1.45E-07	8.23E-08	3.41E-06	1.02E-02
200-EA-1	UPR-200-E-40	2.00E-09	7.31E-10	7.00E-06	3.02E-07	3.44E-07	5.28E-06	1.58E-02
200-EA-1	UPR-200-E-9	5.27E-09	4.30E-10	4.23E-04	1.89E-05	4.83E-06	4.31E-04	1.29E+00
200-IS-1	UPR-200-W-2	3.35E-08	2.97E-09	3.84E-03	1.73E-04	3.28E-05	3.90E-03	1.17E+01

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-IS-1	UPR-200-E-145	2.70E-08	2.12E-09	1.77E-03	7.83E-05	2.40E-05	1.81E-03	5.41E+00
200-IS-1	UPR-200-E-3	6.06E-11	4.58E-12	3.34E-06	1.47E-07	4.95E-08	3.41E-06	1.02E-02
200-IS-1	UPR-200-E-7	2.19E-11	1.72E-12	1.44E-06	6.37E-08	1.95E-08	1.47E-06	4.40E-03
200-IS-1	UPR-200-E-77	9.46E-11	8.38E-12	1.08E-05	4.89E-07	9.25E-08	1.10E-05	3.30E-02
200-IS-1	UPR-200-E-78	1.17E-10	4.93E-10	1.59E-06	6.73E-08	3.81E-08	1.59E-06	4.77E-03
200-IS-1	UPR-200-E-79	6.09E-10	4.73E-11	3.92E-05	1.74E-06	5.15E-07	4.00E-05	1.20E-01
200-IS-1	UPR-200-E-84	1.74E-11	1.23E-10	2.54E-07	1.09E-08	5.61E-09	2.61E-07	7.81E-04
200-IS-1	UPR-200-E-86	3.18E-06	1.94E-04	6.72E-04	2.82E-05	1.64E-05	6.66E-04	1.99E+00
200-IS-1	UPR-200-W-102	2.92E-12	2.29E-13	1.91E-07	8.47E-09	2.60E-09	1.95E-07	5.85E-04
200-IS-1	UPR-200-W-130	8.46E-14	7.33E-14	5.29E-10	2.21E-11	1.88E-11	4.48E-10	1.34E-06
200-IS-1	UPR-200-W-131	1.91E-12	1.56E-13	1.53E-07	6.85E-09	1.75E-09	1.56E-07	4.69E-04
200-IS-1	UPR-200-W-135	1.80E-08	1.41E-09	1.18E-03	5.21E-05	1.60E-05	1.20E-03	3.60E+00
200-IS-1	UPR-200-W-21	5.26E-08	4.13E-09	3.45E-03	1.53E-04	4.69E-05	3.52E-03	1.06E+01
200-IS-1	UPR-200-W-28	2.92E-10	2.38E-11	2.34E-05	1.05E-06	2.68E-07	2.39E-05	7.16E-02
200-IS-1	UPR-200-W-29	6.95E-10	5.25E-11	3.83E-05	1.69E-06	5.68E-07	3.92E-05	1.17E-01
200-IS-1	UPR-200-W-32	1.43E-09	1.12E-10	9.35E-05	4.14E-06	1.27E-06	9.54E-05	2.86E-01
200-IS-1	UPR-200-W-38	3.65E-08	2.87E-09	2.40E-03	1.06E-04	3.25E-05	2.44E-03	7.33E+00
200-IS-1	UPR-200-W-97	7.66E-11	6.02E-12	5.03E-06	2.23E-07	6.83E-08	5.13E-06	1.54E-02
200-IS-1	UPR-200-W-98	9.00E-10	7.97E-11	1.03E-04	4.65E-06	8.80E-07	1.05E-04	3.14E-01
200-OA-1	2101-M-Pond	3.34E-07	1.98E-06	4.26E-03	1.82E-04	1.03E-04	4.31E-03	1.29E+01
200-OA-1	216-S-10P	7.14E-05	2.46E-05	2.35E-01	9.65E-03	1.62E-02	1.70E-01	5.12E+02
200-OA-1	216-S-19	6.14E-08	4.25E-08	2.96E-04	1.23E-05	1.34E-05	2.29E-04	6.87E-01
200-OA-1	216-S-26	1.85E-08	5.86E-09	5.60E-05	2.14E-06	5.40E-06	3.86E-05	1.16E-01
200-OA-1	216-T-1	1.09E-08	5.49E-09	7.89E-05	3.39E-06	2.68E-06	7.09E-05	2.13E-01
200-OA-1	216-W-LWC	4.38E-07	1.43E-07	1.36E-03	5.36E-05	1.18E-04	9.57E-04	2.88E+00
200-PW-1	216-Z-1%2stripped	3.85E-11	3.34E-11	2.41E-07	1.01E-08	8.54E-09	2.04E-07	6.12E-04
200-PW-1	216-Z-1&2	1.17E-10	8.13E-11	3.51E-06	1.56E-07	4.53E-08	3.47E-06	1.04E-02
200-PW-1	216-Z-12	1.11E-08	9.63E-09	7.54E-05	3.16E-06	2.53E-06	6.49E-05	1.95E-01
200-PW-1	216-Z-12stripped	1.64E-13	8.71E-14	1.05E-08	4.66E-10	1.40E-10	1.08E-08	3.22E-05
200-PW-1	216-Z-12vit	1.24E-11	1.08E-11	7.77E-08	3.24E-09	2.75E-09	6.57E-08	1.97E-04
200-PW-1	216-Z-18	1.80E-09	1.56E-09	1.12E-05	4.69E-07	3.98E-07	9.51E-06	2.85E-02
200-PW-1	216-Z-18stripped	2.87E-12	2.49E-12	1.80E-08	7.50E-10	6.37E-10	1.52E-08	4.56E-05

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-PW-1	216-Z-1A	2.60E-09	2.13E-09	3.33E-05	1.45E-06	6.95E-07	3.12E-05	9.37E-02
200-PW-1	216-Z-3	3.27E-11	1.14E-11	2.78E-06	1.24E-07	2.96E-08	2.83E-06	8.48E-03
200-PW-1	216-Z-9	1.46E-10	7.04E-11	1.01E-05	4.49E-07	1.26E-07	1.03E-05	3.09E-02
200-PW-1	216-Z-9mined	1.29E-13	6.84E-14	8.27E-09	3.66E-10	1.10E-10	8.45E-09	2.53E-05
200-PW-1	216-Z-9stripped	1.29E-13	6.84E-14	8.27E-09	3.66E-10	1.10E-10	8.45E-09	2.53E-05
200-PW-1	241-Z-361	2.04E-09	1.73E-09	1.90E-05	8.10E-07	5.10E-07	1.72E-05	5.16E-02
200-PW-3	216-A-24	8.19E-06	3.04E-06	2.87E-02	1.24E-03	1.41E-03	2.17E-02	6.50E+01
200-PW-3	216-A-31	1.59E-06	2.89E-06	2.04E-02	8.53E-04	5.24E-04	1.99E-02	5.97E+01
200-PW-3	216-A-7	1.28E-05	2.33E-05	1.64E-01	6.87E-03	4.22E-03	1.61E-01	4.81E+02
200-PW-3	216-A-8	4.91E-05	1.85E-05	1.73E-01	7.45E-03	8.45E-03	1.30E-01	3.91E+02
200-PW-6	216-Z-10	8.44E-10	7.47E-11	9.66E-05	4.36E-06	8.25E-07	9.82E-05	2.94E-01
200-PW-6	216-Z-5	6.46E-10	5.72E-11	7.39E-05	3.34E-06	6.31E-07	7.52E-05	2.25E-01
200-PW-6	216-Z-8	5.61E-14	2.97E-14	3.59E-09	1.59E-10	4.79E-11	3.67E-09	1.10E-05
200-PW-6	241-Z-8	5.61E-14	2.97E-14	3.59E-09	1.59E-10	4.79E-11	3.67E-09	1.10E-05
200-SW-2	216-C-9	3.18E-09	1.16E-07	1.71E-05	7.00E-07	4.57E-07	1.51E-05	4.52E-02
200-SW-2	216-T-4A	3.03E-06	2.44E-07	1.98E-01	8.78E-03	2.70E-03	2.02E-01	6.07E+02
200-WA-1	200-W-22	1.38E-10	1.08E-11	9.07E-06	4.01E-07	1.23E-07	9.25E-06	2.77E-02
200-WA-1	200-W-42	4.04E-11	2.52E-11	2.02E-07	8.26E-09	9.57E-09	1.53E-07	4.60E-04
200-WA-1	200-W-9	2.77E-11	2.26E-12	2.21E-06	9.88E-08	2.53E-08	2.26E-06	6.76E-03
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	2.94E-05	1.45E-04	7.24E-01	3.11E-02	1.50E-02	7.41E-01	2.22E+03
200-WA-1	216-S-12	4.29E-08	2.11E-07	1.05E-03	4.54E-05	2.18E-05	1.08E-03	3.24E+00
200-WA-1	216-S-14	9.75E-10	4.80E-09	2.40E-05	1.03E-06	4.96E-07	2.46E-05	7.36E-02
200-WA-1	216-S-20	2.66E-04	1.51E-02	1.77E-01	7.57E-03	4.01E-03	1.81E-01	5.41E+02
200-WA-1	216-S-22	8.97E-16	3.03E-15	1.69E-11	6.93E-13	4.04E-13	1.51E-11	4.52E-08
200-WA-1	216-S-23	3.11E-13	1.05E-12	5.86E-09	2.40E-10	1.40E-10	5.22E-09	1.57E-05
200-WA-1	216-S-25	2.03E-08	3.76E-08	2.47E-04	1.02E-05	6.77E-06	2.30E-04	6.89E-01
200-WA-1	216-S-3	2.31E-08	7.53E-07	6.82E-04	3.02E-05	9.28E-06	6.96E-04	2.09E+00
200-WA-1	216-S-4	4.00E-12	1.97E-11	9.84E-08	4.23E-09	2.03E-09	1.01E-07	3.02E-04
200-WA-1	216-S-5	9.07E-07	7.27E-08	5.95E-02	2.63E-03	8.08E-04	6.07E-02	1.82E+02
200-WA-1	216-S-6	1.06E-06	1.24E-06	5.10E-02	2.23E-03	7.66E-04	5.08E-02	1.52E+02
200-WA-1	216-S-7	8.94E-05	2.95E-04	1.40E+00	5.56E-02	3.65E-02	1.14E+00	3.41E+03

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-WA-1	216-S-8	4.11E-06	2.02E-05	1.01E-01	4.35E-03	2.09E-03	1.03E-01	3.10E+02
200-WA-1	216-T-12	1.08E-06	9.77E-08	7.09E-02	3.14E-03	9.64E-04	7.24E-02	2.17E+02
200-WA-1	216-T-2	1.22E-09	9.97E-11	9.79E-05	4.37E-06	1.12E-06	9.97E-05	2.99E-01
200-WA-1	216-T-20	5.40E-12	4.20E-13	3.50E-07	1.55E-08	4.58E-09	3.57E-07	1.07E-03
200-WA-1	216-T-27	1.48E-05	8.45E-04	7.58E-03	3.16E-04	1.96E-04	7.39E-03	2.21E+01
200-WA-1	216-T-28	4.31E-04	2.53E-02	5.21E-02	2.17E-03	1.37E-03	5.03E-02	1.51E+02
200-WA-1	216-T-29	7.84E-12	6.40E-13	6.27E-07	2.80E-08	7.17E-09	6.39E-07	1.91E-03
200-WA-1	216-T-33	2.16E-07	1.71E-08	1.42E-02	6.27E-04	1.92E-04	1.45E-02	4.33E+01
200-WA-1	216-T-34	2.20E-06	8.42E-07	7.69E-03	3.32E-04	3.78E-04	5.79E-03	1.74E+01
200-WA-1	216-T-35	3.82E-06	1.39E-06	1.34E-02	5.77E-04	6.57E-04	1.01E-02	3.02E+01
200-WA-1	216-T-36	2.37E-11	1.45E-09	1.89E-10	7.38E-12	7.71E-12	1.60E-10	4.79E-07
200-WA-1	216-T-8	1.03E-11	8.37E-13	8.21E-07	3.67E-08	9.40E-09	8.37E-07	2.51E-03
200-WA-1	216-U-1&2	1.79E-05	1.48E-06	1.29E+00	5.75E-02	1.62E-02	1.32E+00	3.96E+03
200-WA-1	216-U-12	5.46E-04	3.27E-02	2.11E+00	9.35E-02	2.87E-02	2.15E+00	6.46E+03
200-WA-1	216-U-13	2.31E-12	1.88E-13	1.85E-07	8.26E-09	2.12E-09	1.89E-07	5.65E-04
200-WA-1	216-U-14	2.88E-06	1.14E-05	2.83E-02	1.20E-03	7.83E-04	2.76E-02	8.29E+01
200-WA-1	216-U-15	4.06E-08	3.31E-09	3.25E-03	1.45E-04	3.72E-05	3.32E-03	9.94E+00
200-WA-1	216-U-16	2.01E-08	6.36E-09	6.07E-05	2.33E-06	5.86E-06	4.18E-05	1.26E-01
200-WA-1	216-U-17	3.92E-08	1.24E-08	1.19E-04	4.55E-06	1.15E-05	8.18E-05	2.46E-01
200-WA-1	216-U-3	8.64E-08	6.79E-09	5.67E-03	2.51E-04	7.70E-05	5.78E-03	1.73E+01
200-WA-1	216-U-4	6.11E-11	4.97E-12	4.88E-06	2.18E-07	5.59E-08	4.97E-06	1.49E-02
200-WA-1	216-U-4A	2.47E-07	1.36E-07	1.15E-03	4.92E-05	4.73E-05	9.57E-04	2.87E+00
200-WA-1	216-U-4B	1.13E-08	1.17E-08	6.58E-05	2.80E-06	2.36E-06	5.80E-05	1.74E-01
200-WA-1	216-U-5	1.56E-06	1.09E-05	2.27E-02	9.71E-04	5.01E-04	2.33E-02	6.98E+01
200-WA-1	216-U-6	1.56E-06	1.09E-05	2.27E-02	9.71E-04	5.01E-04	2.33E-02	6.98E+01
200-WA-1	216-U-7	4.85E-13	2.98E-11	3.87E-12	1.51E-13	1.58E-13	3.27E-12	9.80E-09
200-WA-1	216-U-8	1.27E-04	1.17E-05	8.34E+00	3.69E-01	1.13E-01	8.51E+00	2.55E+04
200-WA-1	216-Z-13	9.28E-10	7.94E-10	7.41E-06	3.14E-07	2.20E-07	6.56E-06	1.97E-02
200-WA-1	216-Z-14	9.79E-10	8.38E-10	7.72E-06	3.27E-07	2.31E-07	6.83E-06	2.05E-02
200-WA-1	216-Z-15	9.77E-10	8.35E-10	7.96E-06	3.38E-07	2.33E-07	7.08E-06	2.12E-02
200-WA-1	216-Z-16	2.61E-08	2.27E-08	1.64E-04	6.82E-06	5.80E-06	1.38E-04	4.15E-01
200-WA-1	216-Z-17	9.43E-09	8.18E-09	5.90E-05	2.46E-06	2.09E-06	5.00E-05	1.50E-01

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
200-WA-1	216-Z-21	3.94E-08	3.42E-08	2.47E-04	1.03E-05	8.75E-06	2.09E-04	6.27E-01
200-WA-1	216-Z-4	4.04E-11	3.57E-12	4.62E-06	2.08E-07	3.95E-08	4.70E-06	1.41E-02
200-WA-1	216-Z-6	8.59E-11	7.60E-12	9.83E-06	4.43E-07	8.39E-08	1.00E-05	3.00E-02
200-WA-1	216-Z-7	2.73E-08	2.04E-08	3.09E-03	1.39E-04	2.64E-05	3.14E-03	9.42E+00
200-WA-1	UPR-200-W-101	1.95E-08	1.53E-09	1.28E-03	5.65E-05	1.73E-05	1.30E-03	3.90E+00
200-WA-1	UPR-200-W-103	2.06E-14	1.79E-14	1.29E-10	5.39E-12	4.58E-12	1.09E-10	3.28E-07
200-WA-1	UPR-200-W-138	6.42E-08	5.04E-09	4.21E-03	1.86E-04	5.72E-05	4.30E-03	1.29E+01
200-WA-1	UPR-200-W-163	1.10E-07	8.70E-09	7.25E-03	3.21E-04	9.85E-05	7.40E-03	2.22E+01
200-WA-1	UPR-200-W-19	5.90E-11	4.80E-12	4.73E-06	2.11E-07	5.41E-08	4.82E-06	1.44E-02
200-WA-1	UPR-200-W-20	8.46E-15	2.40E-14	1.11E-10	4.20E-12	3.21E-12	7.75E-11	2.33E-07
200-WA-1	UPR-200-W-33	1.10E-11	8.60E-13	7.19E-07	3.18E-08	9.76E-09	7.33E-07	2.20E-03
200-WA-1	UPR-200-W-39	1.66E-09	1.30E-10	1.09E-04	4.83E-06	1.48E-06	1.11E-04	3.34E-01
200-WA-1	UPR-200-W-82	1.69E-14	4.81E-14	2.22E-10	8.41E-12	6.41E-12	1.55E-10	4.65E-07
200-WA-1	UPR-200-W-95	1.63E-11	8.02E-11	4.01E-07	1.72E-08	8.28E-09	4.10E-07	1.23E-03
WMA-A-AX	216-A-16	8.46E-12	5.19E-10	6.75E-11	2.63E-12	2.75E-12	5.69E-11	1.71E-07
WMA-A-AX	216-A-17	4.16E-12	2.55E-10	3.32E-11	1.29E-12	1.35E-12	2.80E-11	8.40E-08
WMA-A-AX	216-A-23A	1.62E-14	1.14E-13	2.36E-10	1.01E-11	5.22E-12	2.42E-10	7.26E-07
WMA-A-AX	216-A-23B	1.62E-14	1.14E-13	2.36E-10	1.01E-11	5.22E-12	2.42E-10	7.26E-07
WMA-A-AX	216-A-39	1.65E-11	3.00E-11	2.12E-07	8.85E-09	5.44E-09	2.07E-07	6.20E-04
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	3.34E-07	2.05E-05	4.11E-05	1.73E-06	9.93E-07	4.09E-05	1.22E-01
WMA-A-AX	241-A-105	5.62E-08	1.88E-07	7.50E-04	3.16E-05	1.84E-05	7.44E-04	2.23E+00
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	2.15E-08	1.32E-06	3.43E-06	1.45E-07	8.23E-08	3.41E-06	1.02E-02
WMA-A-AX	UPR-200-E-119	6.64E-12	4.07E-10	1.06E-09	4.46E-11	2.54E-11	1.05E-09	3.16E-06
WMA-B-BX-BY	200-E-60	2.42E-13	1.48E-11	1.93E-12	7.53E-14	7.87E-14	1.63E-12	4.88E-09
WMA-B-BX-BY	241-B-101	2.18E-06	1.32E-04	3.90E-05	1.61E-06	1.14E-06	3.56E-05	1.07E-01
WMA-B-BX-BY	241-B-105	4.35E-04	2.63E-02	1.72E-03	6.39E-05	4.37E-05	1.41E-03	4.22E+00
WMA-B-BX-BY	241-B-106	2.62E-06	1.59E-04	1.33E-05	5.08E-07	3.40E-07	1.13E-05	3.38E-02
WMA-B-BX-BY	241-B-107	2.82E-05	1.69E-03	3.13E-04	1.25E-05	7.53E-06	2.91E-04	8.73E-01
WMA-B-BX-BY	241-B-110**	3.83E-05	2.32E-03	4.41E-04	1.79E-05	1.30E-05	3.89E-04	1.17E+00
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	1.04E-07	6.34E-06	1.88E-05	7.95E-07	5.54E-07	1.76E-05	5.29E-02
WMA-B-BX-BY	241-BX-102*	2.48E-04	1.32E-02	3.18E+00	1.44E-01	2.72E-02	3.24E+00	9.70E+03
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	2.95E-05	1.78E-03	1.17E-04	4.33E-06	2.97E-06	9.56E-05	2.87E-01
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	1.60E-08	1.21E-09	8.82E-04	3.88E-05	1.31E-05	9.01E-04	2.70E+00
WMA-B-BX-BY	UPR-200-E-108	3.52E-09	2.76E-10	2.31E-04	1.02E-05	3.14E-06	2.36E-04	7.06E-01
WMA-B-BX-BY	UPR-200-E-109	7.19E-11	5.86E-12	5.76E-06	2.57E-07	6.59E-08	5.87E-06	1.76E-02
WMA-B-BX-BY	UPR-200-E-110	3.53E-09	2.67E-10	1.95E-04	8.59E-06	2.89E-06	1.99E-04	5.97E-01
WMA-B-BX-BY	UPR-200-E-38	5.30E-06	3.28E-04	2.25E-04	9.40E-06	6.11E-06	2.11E-04	6.33E-01
WMA-B-BX-BY	UPR-200-E-6	7.07E-10	5.34E-11	3.90E-05	1.72E-06	5.78E-07	3.98E-05	1.19E-01
WMA-B-BX-BY	UPR-200-E-73	1.65E-09	1.29E-10	1.08E-04	4.78E-06	1.47E-06	1.10E-04	3.30E-01
WMA-B-BX-BY	UPR-200-E-74	7.84E-15	6.38E-16	6.27E-10	2.80E-11	7.18E-12	6.39E-10	1.91E-06
WMA-B-BX-BY	UPR-200-E-75	7.07E-10	5.34E-11	3.90E-05	1.72E-06	5.78E-07	3.98E-05	1.19E-01
WMA-C	216-C-8	9.93E-14	1.80E-13	1.27E-09	5.32E-11	3.27E-11	1.24E-09	3.73E-06
WMA-C	241-C-101	9.63E-08	5.84E-06	1.28E-05	5.44E-07	2.84E-07	1.30E-05	3.90E-02
WMA-C	241-C-104	1.19E-08	5.67E-10	2.62E-04	1.12E-05	5.83E-06	2.69E-04	8.07E-01
WMA-C	241-C-105	4.23E-05	2.62E-03	1.71E-03	7.18E-05	4.42E-05	1.66E-03	4.96E+00
WMA-C	241-C-108	2.35E-08	8.96E-08	3.46E-04	1.47E-05	8.09E-06	3.47E-04	1.04E+00
WMA-C	241-C-110	4.16E-10	3.42E-11	3.45E-05	1.54E-06	3.82E-07	3.52E-05	1.05E-01
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	2.21E-10	9.33E-10	3.01E-06	1.27E-07	7.20E-08	3.02E-06	9.04E-03
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	2.40E-12	1.95E-13	1.92E-07	8.57E-09	2.20E-09	1.96E-07	5.87E-04
WMA-C	UPR-200-E-16	8.96E-11	4.24E-12	1.91E-06	8.14E-08	4.35E-08	1.96E-06	5.87E-03

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
WMA-C	UPR-200-E-81	1.89E-04	1.13E-02	1.57E-03	6.11E-05	3.86E-05	1.41E-03	4.22E+00
WMA-C	UPR-200-E-82	9.05E-07	5.55E-05	1.16E-04	4.83E-06	3.02E-06	1.11E-04	3.34E-01
WMA-S-SX	241-S-104	4.88E-08	1.66E-09	9.60E-04	3.64E-05	2.70E-05	6.69E-04	2.01E+00
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	3.87E-08	1.31E-07	6.27E-04	2.51E-05	1.60E-05	5.21E-04	1.56E+00
WMA-S-SX	241-SX-108	1.85E-07	7.06E-07	3.42E-03	1.41E-04	8.14E-05	3.08E-03	9.24E+00
WMA-S-SX	241-SX-109	4.12E-09	1.44E-08	6.88E-05	2.77E-06	1.73E-06	5.84E-05	1.75E-01
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	2.24E-06	1.36E-04	6.49E-05	2.68E-06	1.80E-06	5.94E-05	1.78E-01
WMA-S-SX	241-SX-112	6.43E-06	3.80E-04	8.09E-04	3.27E-05	2.03E-05	6.96E-04	2.09E+00
WMA-S-SX	241-SX-113	1.39E-08	6.86E-08	3.43E-04	1.47E-05	7.09E-06	3.51E-04	1.05E+00
WMA-S-SX	241-SX-114	1.24E-08	5.05E-07	6.34E-05	2.50E-06	1.67E-06	5.08E-05	1.52E-01
WMA-S-SX	241-XS-115	1.83E-07	5.24E-06	1.75E-03	6.76E-05	4.75E-05	1.30E-03	3.91E+00
WMA-S-SX	316-4	4.00E-14	1.97E-13	9.85E-10	4.24E-11	2.04E-11	1.01E-09	3.02E-06
WMA-T	241-T-101	4.12E-06	2.30E-04	5.67E-03	2.27E-04	1.40E-04	4.69E-03	1.41E+01
WMA-T	241-T-102	1.19E-07	7.17E-06	1.11E-05	4.64E-07	3.18E-07	1.02E-05	3.06E-02
WMA-T	241-T-103	5.78E-07	3.53E-05	2.60E-05	1.08E-06	7.07E-07	2.38E-05	7.12E-02
WMA-T	241-T-106	7.28E-05	4.48E-03	4.59E-03	1.91E-04	1.26E-04	4.19E-03	1.26E+01
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	2.30E-10	1.81E-11	1.51E-05	6.68E-07	2.05E-07	1.54E-05	4.62E-02
WMA-TX-TY	241-TX-104	4.04E-08	3.58E-09	4.63E-03	2.09E-04	3.95E-05	4.71E-03	1.41E+01
WMA-TX-TY	241-TX-105	1.05E-06	8.94E-08	1.04E-01	4.66E-03	9.95E-04	1.06E-01	3.16E+02
WMA-TX-TY	241-TX-114	7.63E-06	4.56E-04	1.51E-04	6.24E-06	3.50E-06	1.37E-04	4.10E-01
WMA-TX-TY	241-TX-118	1.91E-06	1.14E-04	3.76E-05	1.56E-06	8.75E-07	3.42E-05	1.02E-01
WMA-TX-TY	241-TY-104	1.53E-06	9.12E-05	3.01E-05	1.25E-06	7.01E-07	2.74E-05	8.21E-02
WMA-TX-TY	241-TY-105	1.97E-08	1.61E-09	1.58E-03	7.06E-05	1.81E-05	1.61E-03	4.83E+00
WMA-TX-TY	241-TX-107	1.41E-06	8.42E-05	2.80E-05	1.16E-06	6.50E-07	2.54E-05	7.63E-02
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	3.96E-06	2.36E-04	7.76E-05	3.21E-06	1.80E-06	7.05E-05	2.11E-01
WMA-TX-TY	241-TY-106	4.07E-09	3.31E-10	3.26E-04	1.45E-05	3.73E-06	3.32E-04	9.96E-01
WMA-TX-TY	UPR-200-W-100	1.77E-09	1.33E-10	9.75E-05	4.29E-06	1.45E-06	9.96E-05	2.98E-01

OPU Name	WIDS-Site-Name	Uranium 232 [Ci]	Uranium 233 [Ci]	Uranium 234 [Ci]	Uranium 235 [Ci]	Uranium 236 [Ci]	Uranium 238 [Ci]	total U [kg]
WMA-TX-TY	UPR-200-W-12	2.99E-12	2.32E-13	1.93E-07	8.54E-09	2.53E-09	1.96E-07	5.89E-04
WMA-TX-TY	UPR-200-W-127	3.63E-15	1.03E-14	4.75E-11	1.80E-12	1.37E-12	3.32E-11	9.97E-08
WMA-U	241-U-101	2.40E-08	1.18E-07	5.91E-04	2.54E-05	1.22E-05	6.05E-04	1.81E+00
WMA-U	241-U-104	2.02E-07	1.78E-08	2.31E-02	1.04E-03	1.97E-04	2.35E-02	7.03E+01
WMA-U	241-U-110	3.67E-06	2.19E-04	1.36E-04	5.71E-06	2.93E-06	1.28E-04	3.84E-01
WMA-U	241-U-112	1.10E-07	4.19E-07	4.59E-03	2.03E-04	6.59E-05	4.68E-03	1.40E+01
WMA-U	UPR-200-W-132	8.98E-09	7.04E-10	5.89E-04	2.61E-05	8.00E-06	6.01E-04	1.80E+00
WMA-U	UPR-200-W-24	3.75E-10	3.32E-11	4.29E-05	1.94E-06	3.66E-07	4.36E-05	1.31E-01
* Scaled for UNH solubility of the 1951 o								
** matched leak volume bounds								

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-BC-1	216-B-14	2.62E-01	4.93E-02	6.91E+00	7.45E-01	1.45E+00	1.02E-05	1.45E+01
200-BC-1	216-B-15	2.02E-01	3.81E-02	5.34E+00	5.76E-01	1.12E+00	7.88E-06	1.12E+01
200-BC-1	216-B-16	1.60E-01	3.26E-02	4.48E+00	4.89E-01	9.69E-01	6.83E-06	8.94E+00
200-BC-1	216-B-17	7.04E-02	1.81E-02	2.37E+00	2.68E-01	5.53E-01	3.95E-06	4.08E+00
200-BC-1	216-B-18	2.73E-01	5.14E-02	7.20E+00	7.76E-01	1.51E+00	1.06E-05	1.51E+01
200-BC-1	216-B-19	1.53E-01	3.51E-02	4.71E+00	5.24E-01	1.06E+00	7.53E-06	8.71E+00
200-BC-1	216-B-20	1.17E-01	2.62E-02	3.53E+00	3.91E-01	7.88E-01	5.58E-06	6.65E+00
200-BC-1	216-B-21	1.42E-01	2.77E-02	3.85E+00	4.17E-01	8.20E-01	5.76E-06	7.88E+00
200-BC-1	216-B-22	1.31E-01	2.73E-02	3.73E+00	4.09E-01	8.14E-01	5.75E-06	7.33E+00
200-BC-1	216-B-23	1.24E-01	2.60E-02	3.55E+00	3.89E-01	7.75E-01	5.48E-06	6.96E+00
200-BC-1	216-B-24	1.56E-01	2.94E-02	4.12E+00	4.44E-01	8.65E-01	6.07E-06	8.62E+00
200-BC-1	216-B-25	1.57E-01	2.96E-02	4.15E+00	4.47E-01	8.73E-01	6.12E-06	8.69E+00
200-BC-1	216-B-26	1.52E-01	2.86E-02	4.01E+00	4.33E-01	8.44E-01	5.92E-06	8.40E+00
200-BC-1	216-B-27	1.42E-01	2.67E-02	3.74E+00	4.03E-01	7.85E-01	5.51E-06	7.82E+00
200-BC-1	216-B-28	1.42E-01	2.92E-02	4.01E+00	4.39E-01	8.71E-01	6.14E-06	7.94E+00
200-BC-1	216-B-29	1.49E-01	2.81E-02	3.94E+00	4.25E-01	8.29E-01	5.83E-06	8.25E+00
200-BC-1	216-B-30	1.13E-01	2.63E-02	3.52E+00	3.92E-01	7.96E-01	5.65E-06	6.46E+00
200-BC-1	216-B-31	1.16E-01	2.67E-02	3.58E+00	3.99E-01	8.08E-01	5.74E-06	6.58E+00
200-BC-1	216-B-32	1.10E-01	2.58E-02	3.44E+00	3.84E-01	7.81E-01	5.55E-06	6.25E+00
200-BC-1	216-B-33	1.01E-01	2.51E-02	3.32E+00	3.73E-01	7.65E-01	5.46E-06	5.84E+00
200-BC-1	216-B-34	1.04E-01	2.58E-02	3.41E+00	3.84E-01	7.87E-01	5.61E-06	5.97E+00
200-BC-1	216-B-52	1.87E-01	4.50E-02	5.98E+00	6.70E-01	1.37E+00	9.74E-06	1.07E+01
200-BC-1	216-B-53A	4.36E-04	8.75E-03	1.25E-01	3.52E-02	4.60E-01	3.99E-06	3.08E-01
200-BC-1	216-B-53B	1.90E-05	2.84E-03	2.68E-02	9.07E-03	1.65E-01	1.49E-06	1.50E-02
200-BC-1	216-B-54	7.93E-04	1.01E-02	1.78E-01	4.62E-02	4.96E-01	4.18E-06	5.52E-01
200-BC-1	216-B-58	3.31E-04	5.27E-03	8.32E-02	2.25E-02	2.68E-01	2.30E-06	2.32E-01
200-CB-1	200-E-100	4.38E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.01E-12	2.20E-07
200-CB-1	200-E-28	1.13E-07	2.81E-06	2.72E-05	7.66E-06	2.35E-04	9.87E-10	0.00E+00
200-CB-1	200-E-55	1.45E-07	8.83E-07	2.83E-05	4.52E-06	5.40E-05	3.52E-10	5.89E-06
200-CB-1	200-E-85	9.61E-09	1.62E-08	3.24E-07	7.93E-08	1.02E-06	6.51E-12	2.84E-07
200-CB-1	200-E-88	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-CB-1	200-E-89	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-CB-1	200-E-90	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-CB-1	200-E-91	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-CB-1	200-E-92	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-CB-1	200-E-93	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-CB-1	200-E-97	1.47E-07	8.87E-07	2.87E-05	4.57E-06	5.42E-05	3.53E-10	6.02E-06
200-CB-1	200-E-98	1.22E-07	7.32E-07	2.39E-05	3.79E-06	4.46E-05	2.92E-10	5.02E-06
200-CB-1	200-E-99	4.38E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.01E-12	2.20E-07
200-CB-1	216-B-13	1.97E-08	6.50E-08	3.67E-06	4.92E-07	2.97E-06	2.52E-11	9.02E-07
200-CB-1	216-B-4	3.02E-08	3.66E-08	5.59E-06	5.67E-07	1.05E-06	7.27E-12	1.72E-06
200-CB-1	216-B-60	8.55E-11	1.44E-10	2.88E-09	7.05E-10	8.96E-09	5.84E-14	2.49E-09
200-CB-1	UPR-200-E-1	7.09E-05	3.73E-04	1.08E-01	7.27E-03	7.04E-03	3.32E-08	2.12E-03
200-CB-1	UPR-200-E-80	1.49E-06	5.37E-07	1.55E-04	1.05E-05	1.01E-05	4.79E-11	3.23E-05
200-CB-1	UPR-200-E-85	1.16E-03	5.35E-04	1.25E-02	2.89E-03	2.42E-02	2.03E-07	1.66E-02
200-CB-1	UPR-200-E-87	1.21E-05	8.73E-07	2.52E-04	1.70E-05	1.65E-05	7.77E-11	2.62E-04
200-CP-1	200-E-107	1.81E-11	3.04E-11	6.10E-10	1.49E-10	1.95E-09	1.23E-14	5.52E-10
200-CP-1	200-E-62	8.21E-08	1.65E-06	1.92E-05	5.51E-06	1.09E-04	7.20E-10	3.74E-10
200-CP-1	200-E-63	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-64	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-65	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-67	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-69	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-70	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-71	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-72	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-73	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-74	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-75	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-76	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-77	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-78	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-CP-1	200-E-79	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-CP-1	200-E-80	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-CP-1	200-E-81	3.07E-09	5.17E-09	1.04E-07	2.54E-08	3.26E-07	2.09E-12	9.14E-08
200-CP-1	200-E-84	1.15E-07	2.25E-06	2.64E-05	7.56E-06	1.50E-04	9.84E-10	5.15E-10
200-CP-1	216-A-11	5.69E-08	6.00E-07	1.04E-05	2.69E-06	3.08E-05	2.69E-10	2.00E-10
200-CP-1	216-A-12	5.84E-08	5.81E-07	1.04E-05	2.65E-06	2.96E-05	2.58E-10	2.00E-10
200-CP-1	216-A-13	6.75E-11	1.13E-10	2.27E-09	5.57E-10	7.05E-09	4.49E-14	1.96E-09
200-CP-1	216-A-14	6.74E-12	1.13E-11	2.27E-10	5.56E-11	7.04E-10	4.52E-15	1.96E-10
200-CP-1	216-A-32	2.70E-11	4.54E-11	9.10E-10	2.23E-10	2.82E-09	1.81E-14	7.85E-10
200-CP-1	216-A-35	6.74E-11	1.13E-10	2.27E-09	5.56E-10	7.06E-09	4.60E-14	1.96E-09
200-CP-1	UPR-200-E-39	8.46E-06	4.03E-04	3.56E-03	1.25E-03	2.37E-02	2.18E-07	3.41E-03
200-CR-1	UPR-200-W-61	1.61E-04	8.06E-05	4.24E-03	8.24E-04	2.87E-03	2.50E-08	5.59E-03
200-CR-1	UPR-200-W-96	2.97E-10	2.87E-10	8.96E-09	1.84E-09	8.96E-09	7.38E-14	1.18E-08
200-CW-1	216-A-25	1.17E-01	2.50E+00	2.91E+01	8.52E+00	1.58E+02	1.12E-03	2.91E+00
200-CW-1	216-B-3	8.66E-02	1.82E+00	1.91E+01	5.20E+00	1.44E+02	6.28E-04	1.24E+01
200-CW-1	216-S-16P	1.37E-04	2.33E-04	5.04E-03	1.09E-03	6.56E-03	5.25E-08	6.66E-03
200-CW-1	216-S-17	2.07E-04	1.10E-04	5.52E-03	1.08E-03	3.86E-03	3.34E-08	7.27E-03
200-CW-1	216-U-10	1.20E+00	2.60E+01	3.06E+02	9.14E+01	1.38E+03	1.23E-02	7.28E+01
200-CW-3	216-N-6	1.14E-06	1.48E-06	2.30E-04	2.30E-05	4.19E-05	2.89E-10	6.18E-05
200-CW-3	216-N-1	4.78E-08	1.62E-07	2.90E-05	2.63E-06	4.31E-06	2.84E-11	0.00E+00
200-CW-3	216-N-2	1.09E-06	1.32E-06	2.01E-04	2.04E-05	3.76E-05	2.61E-10	6.17E-05
200-CW-3	216-N-3	1.09E-06	1.32E-06	2.01E-04	2.04E-05	3.76E-05	2.59E-10	6.17E-05
200-CW-3	216-N-4	1.14E-06	1.50E-06	2.30E-04	2.32E-05	4.27E-05	2.95E-10	6.18E-05
200-CW-3	216-N-5	1.09E-06	1.32E-06	2.01E-04	2.04E-05	3.76E-05	2.59E-10	6.17E-05
200-CW-3	216-N-7	1.09E-06	1.32E-06	2.01E-04	2.04E-05	3.76E-05	2.59E-10	6.17E-05
200-CW-5	216-Z-11	1.32E-03	2.91E-02	3.40E-01	1.02E-01	1.54E+00	1.39E-05	1.88E+01
200-CW-5	216-Z-19	5.37E-04	1.19E-02	1.39E-01	4.16E-02	6.29E-01	5.64E-06	7.66E+00
200-CW-5	216-Z-1D	4.76E-03	7.57E-02	1.09E+00	2.94E-01	3.92E+00	3.50E-05	6.01E+01
200-CW-5	216-Z-20	1.80E-08	3.98E-07	4.65E-06	1.39E-06	2.11E-05	1.89E-10	7.46E-07
200-DV-1	216-B-11A&B	3.04E-05	5.39E-05	6.60E-03	7.88E-04	1.65E-03	1.20E-08	1.58E-03
200-DV-1	216-B-35	4.93E-03	5.32E-04	5.23E-02	7.41E-03	1.71E-02	1.29E-07	5.51E-01
200-DV-1	216-B-36	9.03E-03	9.74E-04	9.57E-02	1.36E-02	3.13E-02	2.37E-07	1.01E+00
200-DV-1	216-B-37	2.01E-02	2.17E-03	2.13E-01	3.02E-02	6.97E-02	5.28E-07	2.25E+00
200-DV-1	216-B-38	6.66E-03	7.18E-04	7.06E-02	1.00E-02	2.31E-02	1.75E-07	7.44E-01

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-DV-1	216-B-39	7.17E-03	7.73E-04	7.60E-02	1.08E-02	2.48E-02	1.88E-07	8.01E-01
200-DV-1	216-B-40	7.63E-03	8.23E-04	8.09E-02	1.15E-02	2.65E-02	2.00E-07	8.53E-01
200-DV-1	216-B-41	6.70E-03	7.23E-04	7.11E-02	1.01E-02	2.32E-02	1.76E-07	7.49E-01
200-DV-1	216-B-42	4.10E-02	7.73E-03	1.08E+00	1.17E-01	2.28E-01	1.61E-06	2.27E+00
200-DV-1	216-B-43	5.80E-02	1.09E-02	1.53E+00	1.65E-01	3.22E-01	2.28E-06	3.20E+00
200-DV-1	216-B-44	1.53E-01	2.88E-02	4.04E+00	4.36E-01	8.50E-01	6.02E-06	8.46E+00
200-DV-1	216-B-45	1.35E-01	2.53E-02	3.55E+00	3.83E-01	7.46E-01	5.29E-06	7.43E+00
200-DV-1	216-B-46	1.83E-01	3.45E-02	4.83E+00	5.21E-01	1.02E+00	7.20E-06	1.01E+01
200-DV-1	216-B-47	1.08E-01	2.03E-02	2.84E+00	3.07E-01	5.98E-01	4.22E-06	5.95E+00
200-DV-1	216-B-48	1.12E-01	2.11E-02	2.95E+00	3.18E-01	6.21E-01	4.39E-06	6.18E+00
200-DV-1	216-B-49	1.83E-01	3.45E-02	4.83E+00	5.21E-01	1.02E+00	7.20E-06	1.01E+01
200-DV-1	216-B-5	5.73E-03	2.39E-02	6.91E+00	4.67E-01	4.51E-01	2.13E-06	1.24E-01
200-DV-1	216-B-50	2.61E-04	1.09E-03	1.77E-02	4.02E-03	3.04E-02	2.33E-07	2.24E-03
200-DV-1	216-B-57	6.30E-04	1.77E-03	2.97E-02	6.78E-03	5.24E-02	4.05E-07	6.73E-03
200-DV-1	216-B-7A&B	1.83E-02	2.09E-02	2.92E+00	2.98E-01	6.26E-01	4.38E-06	5.65E+00
200-DV-1	216-B-8	3.29E-02	5.48E-01	1.26E+02	9.74E+00	1.27E+01	7.46E-05	1.12E+00
200-DV-1	216-B-9	2.73E-03	4.35E-02	8.09E+00	7.16E-01	1.14E+00	7.41E-06	1.33E-01
200-DV-1	216-S-13	1.24E-02	4.04E-02	7.04E-01	1.58E-01	1.07E+00	8.49E-06	9.36E-01
200-DV-1	216-S-21	1.17E-03	3.20E-03	5.69E-02	1.28E-02	8.71E-02	6.94E-07	1.37E-02
200-DV-1	216-S-9	2.01E-02	1.99E-01	2.90E+00	6.78E-01	5.14E+00	4.01E-05	3.29E-02
200-DV-1	216-T-14	4.68E-03	5.05E-04	4.96E-02	7.03E-03	1.62E-02	1.23E-07	5.23E-01
200-DV-1	216-T-15	4.85E-03	5.23E-04	5.14E-02	7.28E-03	1.68E-02	1.27E-07	5.42E-01
200-DV-1	216-T-16	4.75E-03	5.12E-04	5.03E-02	7.13E-03	1.65E-02	1.25E-07	5.31E-01
200-DV-1	216-T-17	3.65E-03	3.94E-04	3.87E-02	5.49E-03	1.27E-02	9.59E-08	4.08E-01
200-DV-1	216-T-18	3.55E-03	2.74E-03	7.58E-01	5.15E-02	6.65E-02	1.90E-07	9.24E-02
200-DV-1	216-T-19	4.49E-03	7.61E-02	8.29E+00	1.06E+00	2.37E+00	1.73E-05	2.93E-01
200-DV-1	216-T-21	2.16E-03	2.32E-04	2.28E-02	3.24E-03	7.47E-03	5.66E-08	2.41E-01
200-DV-1	216-T-22	7.17E-03	7.73E-04	7.60E-02	1.08E-02	2.48E-02	1.88E-07	8.01E-01
200-DV-1	216-T-23	6.92E-03	7.46E-04	7.33E-02	1.04E-02	2.40E-02	1.82E-07	7.73E-01
200-DV-1	216-T-24	7.17E-03	7.73E-04	7.60E-02	1.08E-02	2.48E-02	1.88E-07	8.01E-01
200-DV-1	216-T-25	1.39E-02	1.50E-03	1.47E-01	2.09E-02	4.82E-02	3.65E-07	1.55E+00
200-DV-1	216-T-26	3.83E-02	2.96E-02	8.19E+00	5.56E-01	7.18E-01	2.05E-06	9.99E-01

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-DV-1	216-T-3	3.35E-03	4.46E-03	1.29E+00	8.70E-02	8.42E-02	3.97E-07	7.27E-02
200-DV-1	216-T-32	1.62E-02	1.54E-03	2.52E-01	2.44E-02	4.28E-02	2.90E-07	8.35E-01
200-DV-1	216-T-5	6.22E-03	1.40E-01	1.58E+01	2.00E+00	4.39E+00	3.19E-05	4.36E-01
200-DV-1	216-T-6	3.31E-03	4.75E-02	1.37E+01	9.27E-01	8.97E-01	4.23E-06	7.17E-02
200-DV-1	216-T-7	1.03E-01	1.64E+00	2.21E+02	2.46E+01	4.90E+01	3.47E-04	6.58E+00
200-EA-1	200-E-103	2.70E-11	4.53E-11	9.09E-10	2.23E-10	2.82E-09	1.80E-14	7.85E-10
200-EA-1	200-E-25	1.08E-08	3.74E-07	3.43E-06	1.10E-06	2.57E-05	1.73E-10	0.00E+00
200-EA-1	200-E-4	4.24E-12	1.33E-11	5.37E-10	1.08E-10	4.73E-10	3.37E-15	0.00E+00
200-EA-1	200-E-41	2.29E-10	2.24E-10	2.99E-08	3.13E-09	6.98E-09	5.04E-14	1.00E-08
200-EA-1	200-E-54	1.35E-09	2.27E-09	4.56E-08	1.12E-08	1.46E-07	9.20E-13	4.13E-08
200-EA-1	200-E-56	1.75E-03	1.47E-02	4.51E-01	9.73E-02	5.95E-01	4.58E-06	2.14E+01
200-EA-1	200-E-57	2.62E-03	2.21E-02	6.76E-01	1.46E-01	8.93E-01	6.86E-06	3.22E+01
200-EA-1	200-E-68	8.34E-08	1.64E-06	1.92E-05	5.49E-06	1.09E-04	7.14E-10	3.74E-10
200-EA-1	200-E-82	8.53E-08	1.68E-06	1.96E-05	5.62E-06	1.13E-04	7.31E-10	3.83E-10
200-EA-1	200-E-94	4.37E-09	4.78E-09	6.88E-07	7.07E-08	1.42E-07	1.00E-12	2.20E-07
200-EA-1	200-E-95	1.45E-07	8.24E-07	2.81E-05	4.39E-06	4.89E-05	3.31E-10	6.02E-06
200-EA-1	216-A-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	2.50E+00	2.68E+00	5.64E+01	1.34E+01	1.40E+02	9.42E-04	7.56E+01
200-EA-1	216-A-15	5.84E-06	5.81E-05	1.04E-03	2.65E-04	2.96E-03	2.58E-08	2.00E-08
200-EA-1	216-A-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	6.23E-02	1.95E-01	7.88E+00	1.58E+00	6.95E+00	4.95E-05	1.76E-01
200-EA-1	216-A-20	2.13E-06	6.67E-06	2.69E-04	5.42E-05	2.37E-04	1.69E-09	2.69E-04
200-EA-1	216-A-21	2.37E-02	2.21E-01	4.61E+00	1.13E+00	1.00E+01	8.17E-05	4.61E+00
200-EA-1	216-A-22	2.42E-09	7.56E-09	3.06E-07	6.15E-08	2.69E-07	1.92E-12	4.68E-12
200-EA-1	216-A-26	2.60E-11	4.38E-11	8.77E-10	2.15E-10	2.75E-09	1.77E-14	7.70E-10
200-EA-1	216-A-26A	6.75E-12	1.13E-11	2.27E-10	5.57E-11	7.05E-10	4.50E-15	1.96E-10
200-EA-1	216-A-27	1.84E-05	1.32E-02	1.17E-01	4.10E-02	7.76E-01	7.00E-06	3.23E-02
200-EA-1	216-A-28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	1.52E-08	1.10E-05	9.77E-05	3.42E-05	6.47E-04	5.83E-09	2.69E-05
200-EA-1	216-A-30	3.31E-03	6.50E-02	7.65E-01	2.16E-01	4.47E+00	2.69E-05	6.58E-05
200-EA-1	216-A-36A	5.96E-03	2.84E-01	2.51E+00	8.77E-01	1.67E+01	1.54E-04	2.40E+00

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-EA-1	216-A-36B	2.43E-04	6.05E-03	5.84E-02	1.65E-02	5.04E-01	2.12E-06	2.37E-01
200-EA-1	216-A-37-1	4.31E-04	1.28E-02	1.20E-01	3.64E-02	9.61E-01	5.31E-06	1.24E-01
200-EA-1	216-A-37-2	5.76E-04	1.44E-02	1.39E-01	3.91E-02	1.20E+00	5.03E-06	3.76E-02
200-EA-1	216-A-4	3.04E-06	2.21E-03	1.95E-02	6.84E-03	1.29E-01	1.17E-06	5.39E-03
200-EA-1	216-A-40	3.32E-09	1.56E-09	3.62E-08	8.38E-09	7.08E-08	5.97E-13	5.08E-08
200-EA-1	216-A-41	2.50E-06	2.66E-06	5.52E-05	1.35E-05	1.21E-04	1.00E-09	7.37E-05
200-EA-1	216-A-45	4.35E-02	9.45E-02	9.23E-01	2.58E-01	7.87E+00	3.29E-05	1.31E+00
200-EA-1	216-A-5	1.31E+00	8.08E-01	3.26E+01	6.55E+00	2.88E+01	2.05E-04	4.30E+01
200-EA-1	216-A-6	9.19E-02	6.63E-02	2.56E+00	5.19E-01	2.45E+00	1.79E-05	2.94E+00
200-EA-1	216-A-9	1.29E-03	4.07E-03	1.64E-01	3.30E-02	1.45E-01	1.04E-06	9.31E-02
200-EA-1	216-B-10A	3.02E-05	3.65E-05	5.58E-03	5.66E-04	1.04E-03	7.19E-09	1.71E-03
200-EA-1	216-B-10B	1.27E-10	2.13E-10	4.27E-09	1.04E-09	1.33E-08	8.65E-14	3.68E-09
200-EA-1	216-B-12	9.90E-04	1.57E-03	1.90E-01	2.26E-02	4.82E-02	3.51E-07	5.33E-02
200-EA-1	216-B-51	3.20E-05	6.03E-06	8.45E-04	9.11E-05	1.78E-04	1.25E-09	1.77E-03
200-EA-1	216-B-55	4.21E-06	1.97E-06	4.57E-05	1.06E-05	8.98E-05	7.54E-10	6.45E-05
200-EA-1	216-B-59	1.68E-09	7.87E-10	1.82E-08	4.23E-09	3.57E-08	3.01E-13	2.56E-08
200-EA-1	216-B-6	1.81E-05	2.19E-05	3.35E-03	3.40E-04	6.27E-04	4.36E-09	1.03E-03
200-EA-1	216-B-62	9.94E-03	5.67E-03	1.69E-01	3.68E-02	2.34E-01	1.85E-06	2.24E-01
200-EA-1	216-B-63	1.04E-04	1.01E-03	1.59E-02	3.59E-03	2.64E-02	2.00E-07	4.53E-02
200-EA-1	216-BY-201	1.14E-03	2.14E-04	3.00E-02	3.24E-03	6.32E-03	4.47E-08	6.29E-02
200-EA-1	216-C-1	1.16E-05	9.74E-05	2.98E-03	6.45E-04	3.94E-03	3.03E-08	1.42E-01
200-EA-1	216-C-10	4.84E-06	4.09E-05	1.24E-03	2.68E-04	1.67E-03	1.29E-08	5.68E-02
200-EA-1	216-C-2	6.71E-07	1.14E-05	1.46E-04	4.13E-05	6.95E-04	5.23E-09	0.00E+00
200-EA-1	216-C-3	3.25E-06	2.20E-05	7.29E-04	1.55E-04	8.78E-04	6.84E-09	2.84E-02
200-EA-1	216-C-4	2.51E-06	3.35E-05	5.98E-04	1.53E-04	1.71E-03	1.47E-08	7.71E-03
200-EA-1	216-C-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	1.36E-04	1.37E-03	2.02E-02	4.76E-03	3.76E-02	2.97E-07	2.10E-02
200-EA-1	216-C-7	1.02E-11	1.02E-10	1.84E-09	4.67E-10	5.16E-09	4.47E-14	0.00E+00
200-EA-1	UPR-200-E-117	9.84E-05	5.61E-05	1.67E-03	3.64E-04	2.31E-03	1.83E-08	2.22E-03
200-EA-1	UPR-200-E-40	6.51E-07	3.10E-05	2.74E-04	9.58E-05	1.82E-03	1.68E-08	2.62E-04
200-EA-1	UPR-200-E-9	1.23E-03	8.80E-04	1.23E-01	1.33E-02	2.59E-02	1.82E-07	6.81E-02
200-IS-1	UPR-200-W-2	4.76E-04	1.71E-04	4.95E-02	3.34E-03	3.23E-03	1.53E-08	1.03E-02

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-IS-1	UPR-200-E-145	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	1.54E-06	1.66E-07	1.63E-05	2.31E-06	5.32E-06	4.03E-11	1.72E-04
200-IS-1	UPR-200-E-7	1.51E-06	2.53E-05	2.86E-03	3.62E-04	7.95E-04	5.78E-09	1.06E-04
200-IS-1	UPR-200-E-77	1.34E-06	4.83E-07	1.40E-04	9.43E-06	9.12E-06	4.30E-11	2.91E-05
200-IS-1	UPR-200-E-78	3.56E-06	3.00E-05	9.19E-04	1.99E-04	1.21E-03	9.33E-09	4.37E-02
200-IS-1	UPR-200-E-79	1.08E-04	1.61E-04	2.01E-02	2.36E-03	4.87E-03	3.55E-08	6.07E-03
200-IS-1	UPR-200-E-84	5.17E-06	3.18E-06	1.28E-04	2.58E-05	1.13E-04	8.06E-10	1.69E-04
200-IS-1	UPR-200-E-86	2.17E-02	1.21E-02	3.26E-01	7.30E-02	5.14E-01	4.10E-06	4.33E-01
200-IS-1	UPR-200-W-102	2.01E-05	2.20E-06	2.48E-04	3.15E-05	6.91E-05	5.03E-10	1.41E-03
200-IS-1	UPR-200-W-130	3.44E-08	7.61E-07	8.89E-06	2.67E-06	4.04E-05	3.62E-10	8.89E-06
200-IS-1	UPR-200-W-131	4.48E-07	3.20E-07	4.48E-05	4.83E-06	9.41E-06	6.60E-11	2.47E-05
200-IS-1	UPR-200-W-135	2.51E-04	1.74E-04	1.97E-02	2.49E-03	5.48E-03	3.98E-08	1.76E-02
200-IS-1	UPR-200-W-21	7.34E-04	5.11E-04	5.76E-02	7.30E-03	1.60E-02	1.17E-07	5.15E-02
200-IS-1	UPR-200-W-28	6.84E-05	4.88E-05	6.84E-03	7.37E-04	1.44E-03	1.01E-08	3.78E-03
200-IS-1	UPR-200-W-29	1.76E-05	1.90E-06	1.87E-04	2.65E-05	6.10E-05	4.62E-10	1.97E-03
200-IS-1	UPR-200-W-32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	5.10E-04	3.55E-04	4.00E-02	5.07E-03	1.11E-02	8.10E-08	3.57E-02
200-IS-1	UPR-200-W-97	3.94E-06	8.86E-05	9.99E-03	1.27E-03	2.78E-03	2.02E-08	2.76E-04
200-IS-1	UPR-200-W-98	1.28E-05	4.60E-06	1.33E-03	8.97E-05	8.68E-05	4.09E-10	2.77E-04
200-OA-1	2101-M-Pond	2.14E-04	6.87E-04	2.72E-02	5.49E-03	2.51E-02	1.78E-07	6.88E-04
200-OA-1	216-S-10P	4.60E-02	1.63E+00	1.49E+01	4.81E+00	1.11E+02	7.63E-04	5.40E+01
200-OA-1	216-S-19	1.26E-06	2.48E-05	2.90E-04	8.43E-05	1.36E-03	1.12E-08	1.04E-03
200-OA-1	216-S-26	2.05E-07	5.11E-06	4.94E-05	1.39E-05	4.26E-04	1.79E-09	1.84E-04
200-OA-1	216-T-1	2.04E-05	4.97E-04	5.62E-03	1.55E-03	3.42E-02	2.25E-07	3.57E-04
200-OA-1	216-W-LWC	9.23E-04	2.60E-02	2.46E-01	7.30E-02	2.01E+00	1.03E-05	1.39E-02
200-PW-1	216-Z-1%2stripped	7.18E+00	1.59E+02	1.85E+03	5.56E+02	8.42E+03	7.55E-02	4.49E+02
200-PW-1	216-Z-1&2	4.98E-01	9.95E+00	1.48E+02	3.67E+01	5.24E+02	4.69E-03	1.88E+02
200-PW-1	216-Z-12	1.08E+01	1.73E+02	2.48E+03	6.71E+02	8.95E+03	7.98E-02	8.50E+03
200-PW-1	216-Z-12stripped	5.65E-01	1.79E+00	9.45E+01	1.69E+01	6.28E+01	4.73E-04	2.29E+01
200-PW-1	216-Z-12vit	8.33E-03	1.84E-01	2.15E+00	6.45E-01	9.76E+00	8.76E-05	1.19E+02
200-PW-1	216-Z-18	7.08E+00	1.56E+02	1.83E+03	5.48E+02	8.30E+03	7.44E-02	7.88E+02
200-PW-1	216-Z-18stripped	5.35E-01	1.18E+01	1.38E+02	4.15E+01	6.28E+02	5.63E-03	3.34E+01

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-PW-1	216-Z-1A	1.24E+01	2.73E+02	3.19E+03	9.57E+02	1.45E+04	1.30E-01	3.88E+03
200-PW-1	216-Z-3	2.17E-01	6.32E-01	6.19E+01	7.18E+00	2.02E+01	1.46E-04	2.67E+03
200-PW-1	216-Z-9	1.02E+01	3.18E+01	1.94E+03	3.11E+02	1.10E+03	8.20E-03	6.00E+02
200-PW-1	216-Z-9mined	4.44E-01	1.41E+00	7.42E+01	1.33E+01	4.93E+01	3.71E-04	1.80E+01
200-PW-1	216-Z-9stripped	4.44E-01	1.41E+00	7.42E+01	1.33E+01	4.93E+01	3.71E-04	1.80E+01
200-PW-1	241-Z-361	1.67E+00	2.45E+01	4.07E+02	9.93E+01	1.26E+03	1.12E-02	6.21E+03
200-PW-3	216-A-24	2.27E-03	1.68E-02	3.55E-01	8.50E-02	8.25E-01	7.09E-06	2.98E-01
200-PW-3	216-A-31	3.89E-04	3.64E-03	7.57E-02	1.86E-02	1.65E-01	1.34E-06	2.29E-02
200-PW-3	216-A-7	3.14E-03	2.93E-02	6.10E-01	1.50E-01	1.33E+00	1.08E-05	1.84E-01
200-PW-3	216-A-8	3.77E-03	7.01E-02	8.68E-01	2.56E-01	3.93E+00	3.55E-05	5.18E-01
200-PW-6	216-Z-10	2.30E-02	4.95E-02	1.43E+01	9.66E-01	9.35E-01	4.41E-06	1.85E+02
200-PW-6	216-Z-5	4.76E-02	1.02E-01	2.96E+01	2.00E+00	1.93E+00	9.12E-06	1.18E+03
200-PW-6	216-Z-8	4.91E-04	1.56E-03	8.21E-02	1.47E-02	5.45E-02	4.11E-07	5.00E-02
200-PW-6	241-Z-8	4.91E-04	1.56E-03	8.21E-02	1.47E-02	5.45E-02	4.11E-07	5.00E-02
200-SW-2	216-C-9	1.93E-05	8.79E-05	2.43E-03	5.41E-04	3.74E-03	2.96E-08	2.99E-04
200-SW-2	216-T-4A	1.63E-04	1.48E-03	2.41E-02	5.27E-03	3.84E-02	2.99E-07	8.29E-04
200-WA-1	200-W-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	1.11E-09	2.43E-08	2.94E-07	7.97E-08	1.36E-06	1.02E-11	0.00E+00
200-WA-1	200-W-9	4.11E-07	4.98E-07	7.60E-05	7.70E-06	1.42E-05	9.78E-11	2.33E-05
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	5.14E-01	1.38E+00	7.28E+01	1.41E+01	4.92E+01	4.30E-04	2.44E+01
200-WA-1	216-S-12	7.49E-04	2.02E-03	1.06E-01	2.06E-02	7.17E-02	6.26E-07	3.56E-02
200-WA-1	216-S-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	1.20E-01	4.69E-01	1.61E+01	3.37E+00	1.84E+01	1.39E-04	5.62E+01
200-WA-1	216-S-22	2.46E-10	2.38E-10	7.42E-09	1.52E-09	7.42E-09	6.09E-14	9.77E-09
200-WA-1	216-S-23	8.53E-08	8.24E-08	2.57E-06	5.28E-07	2.57E-06	2.12E-11	3.39E-06
200-WA-1	216-S-25	9.60E-04	9.50E-03	1.38E-01	3.24E-02	2.46E-01	1.92E-06	1.42E-05
200-WA-1	216-S-3	7.22E-05	6.95E-05	2.94E-03	5.83E-04	2.35E-03	2.01E-08	8.97E-04
200-WA-1	216-S-4	3.80E-06	1.02E-05	5.38E-04	1.04E-04	3.63E-04	3.17E-09	0.00E+00
200-WA-1	216-S-5	1.39E-04	7.45E-05	3.71E-03	7.24E-04	2.61E-03	2.25E-08	4.89E-03
200-WA-1	216-S-6	1.74E-03	9.06E-03	2.47E-01	5.15E-02	2.64E-01	2.16E-06	5.49E-02
200-WA-1	216-S-7	4.87E-01	2.31E+00	6.94E+01	1.43E+01	6.89E+01	5.69E-04	1.68E+01

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-WA-1	216-S-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	2.42E-05	4.90E-06	3.72E-04	5.94E-05	1.65E-04	1.35E-09	2.60E-03
200-WA-1	216-T-2	1.82E-05	2.20E-05	3.36E-03	3.40E-04	6.28E-04	4.36E-09	1.03E-03
200-WA-1	216-T-20	9.37E-07	1.39E-06	1.75E-04	2.05E-05	4.22E-05	3.08E-10	5.27E-05
200-WA-1	216-T-27	3.33E-03	3.33E-02	6.66E-01	1.65E-01	1.54E+00	1.26E-05	2.30E+00
200-WA-1	216-T-28	2.23E-02	2.74E-01	4.90E+00	1.26E+00	1.33E+01	1.11E-04	1.55E+01
200-WA-1	216-T-29	1.16E-07	1.43E-07	2.16E-05	2.19E-06	4.08E-06	2.82E-11	6.61E-06
200-WA-1	216-T-33	5.66E-09	6.96E-09	1.01E-06	1.04E-07	2.12E-07	1.45E-12	3.16E-07
200-WA-1	216-T-34	1.21E-03	5.76E-02	5.09E-01	1.78E-01	3.38E+00	3.12E-05	1.81E+00
200-WA-1	216-T-35	2.10E-03	1.00E-01	8.85E-01	3.09E-01	5.88E+00	5.42E-05	3.15E+00
200-WA-1	216-T-36	2.30E-09	3.87E-09	7.76E-08	1.90E-08	2.41E-07	1.55E-12	6.70E-08
200-WA-1	216-T-8	1.52E-07	1.85E-07	2.82E-05	2.86E-06	5.27E-06	3.63E-11	8.66E-06
200-WA-1	216-U-1&2	4.26E-04	3.18E-04	4.27E-02	4.64E-03	9.39E-03	6.62E-08	2.34E-02
200-WA-1	216-U-12	1.68E-05	2.50E-04	3.74E-03	1.01E-03	1.40E-02	1.06E-07	1.37E-08
200-WA-1	216-U-13	3.43E-08	4.16E-08	6.35E-06	6.43E-07	1.19E-06	8.17E-12	1.95E-06
200-WA-1	216-U-14	1.35E-03	8.48E-03	2.18E-01	4.78E-02	4.05E-01	3.24E-06	2.32E-03
200-WA-1	216-U-15	2.24E-06	1.66E-06	2.34E-04	2.51E-05	4.87E-05	3.41E-10	1.24E-04
200-WA-1	216-U-16	3.65E-07	9.08E-06	8.77E-05	2.47E-05	7.56E-04	3.18E-09	3.10E-05
200-WA-1	216-U-17	6.52E-07	1.63E-05	1.57E-04	4.43E-05	1.36E-03	5.70E-09	0.00E+00
200-WA-1	216-U-3	2.93E-06	7.88E-06	4.15E-04	8.06E-05	2.80E-04	2.45E-09	0.00E+00
200-WA-1	216-U-4	1.03E-06	1.11E-06	1.70E-04	1.71E-05	3.15E-05	2.17E-10	5.42E-05
200-WA-1	216-U-4A	2.95E-04	7.29E-03	8.41E-02	2.58E-02	4.06E-01	3.66E-06	2.99E-01
200-WA-1	216-U-4B	2.32E-05	3.54E-04	5.09E-03	1.42E-03	1.89E-02	1.67E-07	1.81E-02
200-WA-1	216-U-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	4.72E-11	7.93E-11	1.59E-09	3.90E-10	4.93E-09	3.14E-14	1.37E-09
200-WA-1	216-U-8	5.63E-05	1.74E-04	7.14E-03	1.42E-03	6.21E-03	4.42E-08	4.66E-05
200-WA-1	216-Z-13	1.38E-09	2.67E-08	3.62E-07	9.12E-08	1.24E-06	1.11E-11	5.81E-08
200-WA-1	216-Z-14	1.43E-09	2.80E-08	3.77E-07	9.56E-08	1.31E-06	1.17E-11	6.04E-08
200-WA-1	216-Z-15	1.51E-09	2.83E-08	3.90E-07	9.75E-08	1.31E-06	1.17E-11	6.26E-08
200-WA-1	216-Z-16	1.06E-02	2.35E-01	2.75E+00	8.24E-01	1.25E+01	1.12E-04	2.75E+00
200-WA-1	216-Z-17	3.84E-03	8.49E-02	9.92E-01	2.97E-01	4.50E+00	4.04E-05	9.91E-01

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
200-WA-1	216-Z-21	4.48E-08	9.89E-07	1.16E-05	3.47E-06	5.25E-05	4.71E-10	1.86E-06
200-WA-1	216-Z-4	1.06E-03	2.29E-03	6.62E-01	4.47E-02	4.32E-02	2.04E-07	7.59E+00
200-WA-1	216-Z-6	2.34E-03	5.03E-03	1.45E+00	9.81E-02	9.50E-02	4.48E-07	1.87E+01
200-WA-1	216-Z-7	7.78E-01	1.67E+00	4.84E+02	3.26E+01	3.16E+01	1.49E-04	7.35E+03
200-WA-1	UPR-200-W-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	3.85E-03	8.50E-02	9.94E-01	2.98E-01	4.51E+00	4.05E-05	2.40E-01
200-WA-1	UPR-200-W-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	8.58E-10	2.61E-09	1.09E-07	2.15E-08	9.26E-08	6.60E-13	2.07E-09
200-WA-1	UPR-200-W-19	3.07E-09	2.19E-09	3.07E-07	3.30E-08	6.44E-08	4.52E-13	1.69E-07
200-WA-1	UPR-200-W-20	2.87E-09	2.85E-08	4.15E-07	9.70E-08	7.35E-07	5.74E-12	0.00E+00
200-WA-1	UPR-200-W-33	1.53E-07	1.06E-07	1.20E-05	1.52E-06	3.34E-06	2.43E-11	1.07E-05
200-WA-1	UPR-200-W-39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	5.75E-09	5.69E-08	8.29E-07	1.94E-07	1.47E-06	1.15E-11	0.00E+00
200-WA-1	UPR-200-W-95	7.65E-06	3.84E-06	2.02E-04	3.93E-05	1.37E-04	1.19E-09	2.67E-04
WMA-A-AX	216-A-16	8.22E-10	1.38E-09	2.77E-08	6.79E-09	8.59E-08	5.50E-13	2.39E-08
WMA-A-AX	216-A-17	4.04E-10	6.80E-10	1.36E-08	3.34E-09	4.23E-08	2.70E-13	1.18E-08
WMA-A-AX	216-A-23A	6.35E-09	5.39E-08	1.09E-06	2.67E-07	2.61E-06	2.22E-11	1.09E-06
WMA-A-AX	216-A-23B	6.60E-09	4.79E-08	1.09E-06	2.57E-07	2.20E-06	1.82E-11	1.09E-06
WMA-A-AX	216-A-39	9.14E-06	4.84E-06	1.01E-04	2.47E-05	2.20E-04	1.79E-09	1.35E-04
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	1.18E-03	6.79E-04	2.00E-02	4.37E-03	2.82E-02	2.23E-07	2.62E-02
WMA-A-AX	241-A-105	2.99E-02	1.46E-02	3.64E-01	8.38E-02	6.35E-01	5.06E-06	4.55E-01
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	9.84E-05	5.61E-05	1.67E-03	3.64E-04	2.31E-03	1.83E-08	2.22E-03
WMA-A-AX	UPR-200-E-119	3.03E-08	1.73E-08	5.16E-07	1.12E-07	7.14E-07	5.64E-12	6.85E-07
WMA-B-BX-BY	200-E-60	2.35E-11	3.96E-11	7.93E-10	1.94E-10	2.46E-09	1.61E-14	6.84E-10
WMA-B-BX-BY	241-B-101	3.89E-04	1.05E-03	1.97E-02	4.99E-03	5.47E-02	4.66E-07	2.18E-01
WMA-B-BX-BY	241-B-105	6.39E-02	2.76E-02	6.87E-01	1.67E-01	1.58E+00	1.28E-05	9.17E-01
WMA-B-BX-BY	241-B-106	4.99E-04	2.30E-04	5.73E-03	1.33E-03	1.25E-02	1.02E-07	8.92E-03
WMA-B-BX-BY	241-B-107	8.35E-04	3.28E-03	1.42E-01	3.24E-02	2.12E-01	1.49E-06	1.61E-01
WMA-B-BX-BY	241-B-110**	1.63E-02	9.72E-03	1.89E-01	4.75E-02	5.01E-01	4.25E-06	2.53E-01
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	2.18E-04	5.20E-04	9.73E-03	2.44E-03	2.61E-02	2.23E-07	1.04E-01
WMA-B-BX-BY	241-BX-102*	2.61E-02	3.23E-02	2.07E+00	2.62E-01	1.74E+00	1.38E-05	1.96E+00
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	4.34E-03	1.88E-03	4.66E-02	1.13E-02	1.07E-01	8.71E-07	6.22E-02
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	4.05E-04	4.37E-05	4.30E-03	6.09E-04	1.40E-03	1.06E-08	4.53E-02
WMA-B-BX-BY	UPR-200-E-108	4.92E-05	3.42E-05	3.86E-03	4.89E-04	1.07E-03	7.81E-09	3.45E-03
WMA-B-BX-BY	UPR-200-E-109	1.68E-05	1.20E-05	1.68E-03	1.81E-04	3.54E-04	2.48E-09	9.29E-04
WMA-B-BX-BY	UPR-200-E-110	8.96E-05	9.66E-06	9.50E-04	1.35E-04	3.10E-04	2.35E-09	1.00E-02
WMA-B-BX-BY	UPR-200-E-38	9.58E-03	4.41E-03	1.03E-01	2.38E-02	1.99E-01	1.68E-06	1.37E-01
WMA-B-BX-BY	UPR-200-E-6	1.79E-05	1.93E-06	1.90E-04	2.69E-05	6.21E-05	4.70E-10	2.00E-03
WMA-B-BX-BY	UPR-200-E-73	2.30E-05	1.60E-05	1.80E-03	2.29E-04	5.02E-04	3.65E-09	1.61E-03
WMA-B-BX-BY	UPR-200-E-74	1.16E-10	1.41E-10	2.15E-08	2.18E-09	4.02E-09	2.77E-14	6.61E-09
WMA-B-BX-BY	UPR-200-E-75	1.79E-05	1.93E-06	1.90E-04	2.69E-05	6.21E-05	4.70E-10	2.00E-03
WMA-C	216-C-8	2.38E-09	2.23E-08	4.64E-07	1.14E-07	1.01E-06	8.23E-12	0.00E+00
WMA-C	241-C-101	4.15E-04	1.62E-04	6.40E-03	1.30E-03	6.05E-03	4.35E-08	7.09E-03
WMA-C	241-C-104	8.18E-05	2.24E-03	1.28E-01	2.65E-02	1.14E-01	8.19E-07	1.65E-01
WMA-C	241-C-105	4.49E-02	3.08E-02	8.10E-01	1.83E-01	1.39E+00	1.12E-05	8.01E-01
WMA-C	241-C-108	6.80E-04	5.87E-03	1.91E-01	4.10E-02	2.42E-01	1.85E-06	7.98E+00
WMA-C	241-C-110	8.96E-05	7.07E-05	1.11E-02	1.10E-03	2.00E-03	1.37E-08	4.91E-03
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	6.75E-06	5.68E-05	1.74E-03	3.76E-04	2.30E-03	1.77E-08	8.28E-02
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	5.61E-07	4.00E-07	5.61E-05	6.04E-06	1.18E-05	8.27E-11	3.10E-05
WMA-C	UPR-200-E-16	3.61E-07	1.70E-05	9.63E-04	2.01E-04	8.70E-04	6.24E-09	1.25E-03

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
WMA-C	UPR-200-E-81	1.82E-04	1.66E-02	6.88E-01	1.62E-01	1.17E+00	8.24E-06	7.58E-01
WMA-C	UPR-200-E-82	4.97E-03	2.52E-03	5.43E-02	1.31E-02	1.14E-01	9.38E-07	7.25E-02
WMA-S-SX	241-S-104	1.83E-04	8.38E-03	3.28E-01	7.22E-02	4.69E-01	3.16E-06	4.38E-01
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	9.71E-03	1.11E-02	2.56E-01	5.48E-02	3.12E-01	2.52E-06	3.39E-01
WMA-S-SX	241-SX-108	5.76E-02	5.07E-02	1.52E+00	3.12E-01	1.51E+00	1.25E-05	2.01E+00
WMA-S-SX	241-SX-109	1.09E-03	1.17E-03	2.87E-02	6.08E-03	3.33E-02	2.70E-07	3.80E-02
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	2.41E-03	1.31E-03	2.92E-02	6.85E-03	6.02E-02	5.09E-07	4.91E-02
WMA-S-SX	241-SX-112	2.84E-02	1.34E-02	3.42E-01	7.27E-02	4.14E-01	3.43E-06	4.53E-01
WMA-S-SX	241-SX-113	6.55E-03	3.29E-03	1.73E-01	3.36E-02	1.17E-01	1.02E-06	2.28E-01
WMA-S-SX	241-SX-114	9.71E-04	1.21E-03	2.49E-02	5.43E-03	3.31E-02	2.65E-07	3.31E-02
WMA-S-SX	241-XS-115	1.03E-02	2.20E-02	6.40E-01	1.39E-01	8.67E-01	6.31E-06	8.49E-01
WMA-S-SX	316-4	3.80E-08	1.02E-07	5.38E-06	1.05E-06	3.63E-06	3.18E-11	0.00E+00
WMA-T	241-T-101	1.84E-02	5.08E-02	2.31E+00	4.72E-01	2.42E+00	1.78E-05	2.99E+00
WMA-T	241-T-102	1.32E-04	2.76E-04	5.51E-03	1.35E-03	1.36E-02	1.15E-07	5.02E-02
WMA-T	241-T-103	7.38E-04	5.21E-04	1.18E-02	2.76E-03	2.40E-02	2.01E-07	4.35E-02
WMA-T	241-T-106	1.31E-01	9.14E-02	2.09E+00	4.87E-01	4.25E+00	3.57E-05	7.99E+00
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	1.18E-05	2.66E-04	3.00E-02	3.80E-03	8.35E-03	6.07E-08	8.29E-04
WMA-TX-TY	241-TX-104	5.74E-04	2.07E-04	5.97E-02	4.03E-03	3.90E-03	1.84E-08	1.24E-02
WMA-TX-TY	241-TX-105	1.48E-02	6.87E-03	1.42E+00	1.17E-01	1.70E-01	1.06E-06	5.43E-01
WMA-TX-TY	241-TX-114	6.19E-03	2.49E-03	6.71E-02	1.43E-02	1.19E-01	9.77E-07	8.89E-02
WMA-TX-TY	241-TX-118	1.55E-03	6.22E-04	1.68E-02	3.57E-03	2.98E-02	2.44E-07	2.22E-02
WMA-TX-TY	241-TY-104	1.24E-03	4.98E-04	1.34E-02	2.86E-03	2.38E-02	1.96E-07	1.78E-02
WMA-TX-TY	241-TY-105	4.62E-03	3.30E-03	4.62E-01	4.98E-02	9.71E-02	6.81E-07	2.55E-01
WMA-TX-TY	241-TX-107	1.15E-03	4.61E-04	1.25E-02	2.66E-03	2.21E-02	1.81E-07	1.65E-02
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	3.19E-03	1.28E-03	3.46E-02	7.36E-03	6.14E-02	5.04E-07	4.59E-02
WMA-TX-TY	241-TY-106	9.51E-04	6.79E-04	9.51E-02	1.03E-02	2.00E-02	1.40E-07	5.25E-02
WMA-TX-TY	UPR-200-W-100	4.48E-05	4.83E-06	4.75E-04	6.73E-05	1.55E-04	1.18E-09	5.01E-03

OPU Name	WIDS-Site-Name	Neptunium 237 [Ci]	Plutonium 238 [Ci]	Plutonium 239 [Ci]	Plutonium 240 [Ci]	Plutonium 241 [Ci]	Plutonium 242 [Ci]	Americium 241 [Ci]
WMA-TX-TY	UPR-200-W-12	5.31E-07	7.90E-07	9.90E-05	1.16E-05	2.39E-05	1.74E-10	2.99E-05
WMA-TX-TY	UPR-200-W-127	1.23E-09	1.22E-08	1.78E-07	4.16E-08	3.15E-07	2.46E-12	0.00E+00
WMA-U	241-U-101	1.13E-02	5.67E-03	2.98E-01	5.79E-02	2.01E-01	1.76E-06	3.93E-01
WMA-U	241-U-104	2.86E-03	1.03E-03	2.98E-01	2.01E-02	1.94E-02	9.17E-08	6.20E-02
WMA-U	241-U-110	3.12E-03	1.66E-03	6.10E-02	1.23E-02	7.70E-02	6.31E-07	7.86E-02
WMA-U	241-U-112	4.02E-02	2.14E-02	1.26E+00	2.25E-01	7.60E-01	6.57E-06	1.47E+00
WMA-U	UPR-200-W-132	1.25E-04	8.72E-05	9.84E-03	1.25E-03	2.74E-03	1.99E-08	8.79E-03
WMA-U	UPR-200-W-24	5.32E-06	1.91E-06	5.53E-04	3.74E-05	3.61E-05	1.71E-10	1.15E-04
* Scaled for UNH solubility of the 1951 o								
** matched leak volume bounds								

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-BC-1	216-B-14	2.07E-03	3.57E-03	4.19E-05	9.85E-04
200-BC-1	216-B-15	1.58E-03	2.72E-03	3.22E-05	7.58E-04
200-BC-1	216-B-16	1.25E-03	2.15E-03	2.55E-05	5.98E-04
200-BC-1	216-B-17	5.43E-04	9.36E-04	1.11E-05	2.61E-04
200-BC-1	216-B-18	2.13E-03	3.67E-03	4.35E-05	1.02E-03
200-BC-1	216-B-19	1.19E-03	2.05E-03	2.43E-05	5.70E-04
200-BC-1	216-B-20	9.11E-04	1.57E-03	1.86E-05	4.38E-04
200-BC-1	216-B-21	1.11E-03	1.91E-03	2.26E-05	5.31E-04
200-BC-1	216-B-22	1.02E-03	1.75E-03	2.08E-05	4.89E-04
200-BC-1	216-B-23	9.67E-04	1.67E-03	1.97E-05	4.64E-04
200-BC-1	216-B-24	1.22E-03	2.10E-03	2.49E-05	5.84E-04
200-BC-1	216-B-25	1.23E-03	2.11E-03	2.51E-05	5.89E-04
200-BC-1	216-B-26	1.19E-03	2.04E-03	2.42E-05	5.69E-04
200-BC-1	216-B-27	1.10E-03	1.90E-03	2.26E-05	5.30E-04
200-BC-1	216-B-28	1.11E-03	1.90E-03	2.26E-05	5.31E-04
200-BC-1	216-B-29	1.18E-03	2.03E-03	2.39E-05	5.61E-04
200-BC-1	216-B-30	8.78E-04	1.51E-03	1.79E-05	4.22E-04
200-BC-1	216-B-31	8.96E-04	1.54E-03	1.83E-05	4.30E-04
200-BC-1	216-B-32	8.51E-04	1.47E-03	1.73E-05	4.08E-04
200-BC-1	216-B-33	7.88E-04	1.36E-03	1.60E-05	3.77E-04
200-BC-1	216-B-34	8.04E-04	1.39E-03	1.64E-05	3.85E-04
200-BC-1	216-B-52	1.46E-03	2.52E-03	2.96E-05	6.98E-04
200-BC-1	216-B-53A	1.70E-04	2.94E-04	1.90E-05	4.45E-04
200-BC-1	216-B-53B	1.06E-05	1.78E-05	1.46E-06	3.56E-05
200-BC-1	216-B-54	2.98E-04	5.18E-04	3.24E-05	7.57E-04
200-BC-1	216-B-58	1.26E-04	2.19E-04	1.39E-05	3.25E-04
200-CB-1	200-E-100	3.59E-11	8.95E-11	1.78E-12	4.36E-11
200-CB-1	200-E-28	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CB-1	200-E-55	8.37E-10	1.44E-09	1.68E-11	3.95E-10
200-CB-1	200-E-85	7.98E-11	7.02E-10	2.06E-11	5.23E-10
200-CB-1	200-E-88	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-CB-1	200-E-89	3.58E-11	8.87E-11	1.76E-12	4.30E-11

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-CB-1	200-E-90	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-CB-1	200-E-91	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-CB-1	200-E-92	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-CB-1	200-E-93	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-CB-1	200-E-97	8.55E-10	1.47E-09	1.71E-11	4.04E-10
200-CB-1	200-E-98	7.12E-10	1.23E-09	1.43E-11	3.36E-10
200-CB-1	200-E-99	3.59E-11	8.95E-11	1.78E-12	4.36E-11
200-CB-1	216-B-13	1.28E-10	2.21E-10	2.57E-12	6.05E-11
200-CB-1	216-B-4	2.48E-10	4.26E-10	4.91E-12	1.16E-10
200-CB-1	216-B-60	7.22E-13	6.32E-12	1.84E-13	4.70E-12
200-CB-1	UPR-200-E-1	6.91E-08	1.21E-07	6.94E-10	1.64E-08
200-CB-1	UPR-200-E-80	1.46E-09	2.55E-09	1.47E-11	3.46E-10
200-CB-1	UPR-200-E-85	9.63E-06	6.37E-05	1.94E-06	4.85E-05
200-CB-1	UPR-200-E-87	1.18E-08	2.06E-08	1.18E-10	2.79E-09
200-CP-1	200-E-107	1.49E-13	1.31E-12	3.83E-14	9.74E-13
200-CP-1	200-E-62	2.19E-13	3.73E-13	3.64E-14	9.04E-13
200-CP-1	200-E-63	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-64	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-65	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-67	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-69	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-70	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-71	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-72	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-73	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-74	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-75	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-76	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-77	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-78	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-CP-1	200-E-79	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-CP-1	200-E-80	2.19E-13	3.72E-13	3.61E-14	8.96E-13

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-CP-1	200-E-81	2.56E-11	2.25E-10	6.58E-12	1.67E-10
200-CP-1	200-E-84	3.01E-13	5.12E-13	4.97E-14	1.23E-12
200-CP-1	216-A-11	1.27E-13	2.15E-13	1.49E-14	3.65E-13
200-CP-1	216-A-12	1.25E-13	2.12E-13	1.43E-14	3.49E-13
200-CP-1	216-A-13	5.55E-13	4.90E-12	1.43E-13	3.64E-12
200-CP-1	216-A-14	5.59E-14	4.92E-13	1.45E-14	3.68E-13
200-CP-1	216-A-32	2.24E-13	1.97E-12	5.81E-14	1.48E-12
200-CP-1	216-A-35	5.70E-13	4.98E-12	1.45E-13	3.71E-12
200-CP-1	UPR-200-E-39	3.35E-06	5.54E-06	5.96E-07	1.47E-05
200-CR-1	UPR-200-W-61	2.05E-06	9.05E-06	1.67E-07	4.11E-06
200-CR-1	UPR-200-W-96	5.61E-12	1.77E-11	6.15E-13	1.41E-11
200-CW-1	216-A-25	7.96E-04	1.54E-03	2.19E-04	5.60E-03
200-CW-1	216-B-3	3.30E-03	6.09E-03	9.13E-04	2.34E-02
200-CW-1	216-S-16P	4.29E-06	1.06E-05	5.52E-07	1.24E-05
200-CW-1	216-S-17	2.71E-06	1.17E-05	2.30E-07	5.61E-06
200-CW-1	216-U-10	6.28E-02	1.06E-01	9.98E-03	2.43E-01
200-CW-3	216-N-6	8.80E-09	1.52E-08	1.76E-10	4.15E-09
200-CW-3	216-N-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-CW-3	216-N-2	8.90E-09	1.53E-08	1.76E-10	4.17E-09
200-CW-3	216-N-3	8.55E-09	1.47E-08	1.75E-10	4.10E-09
200-CW-3	216-N-4	8.80E-09	1.52E-08	1.76E-10	4.15E-09
200-CW-3	216-N-5	8.55E-09	1.47E-08	1.75E-10	4.10E-09
200-CW-3	216-N-7	8.55E-09	1.47E-08	1.75E-10	4.10E-09
200-CW-5	216-Z-11	1.62E-02	2.74E-02	2.58E-03	6.29E-02
200-CW-5	216-Z-19	6.61E-03	1.11E-02	1.05E-03	2.56E-02
200-CW-5	216-Z-1D	4.59E-02	7.74E-02	6.47E-03	1.58E-01
200-CW-5	216-Z-20	6.44E-10	1.09E-09	1.02E-10	2.50E-09
200-DV-1	216-B-11A&B	2.12E-07	3.66E-07	4.32E-09	1.02E-07
200-DV-1	216-B-35	6.34E-05	1.09E-04	1.33E-06	3.12E-05
200-DV-1	216-B-36	1.16E-04	2.00E-04	2.43E-06	5.70E-05
200-DV-1	216-B-37	2.58E-04	4.45E-04	5.41E-06	1.27E-04
200-DV-1	216-B-38	8.56E-05	1.47E-04	1.79E-06	4.20E-05

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-DV-1	216-B-39	9.21E-05	1.59E-04	1.93E-06	4.53E-05
200-DV-1	216-B-40	9.81E-05	1.69E-04	2.05E-06	4.82E-05
200-DV-1	216-B-41	8.62E-05	1.48E-04	1.80E-06	4.23E-05
200-DV-1	216-B-42	3.33E-04	5.74E-04	6.60E-06	1.56E-04
200-DV-1	216-B-43	4.71E-04	8.11E-04	9.33E-06	2.20E-04
200-DV-1	216-B-44	1.24E-03	2.14E-03	2.46E-05	5.82E-04
200-DV-1	216-B-45	1.09E-03	1.88E-03	2.16E-05	5.11E-04
200-DV-1	216-B-46	1.49E-03	2.56E-03	2.95E-05	6.96E-04
200-DV-1	216-B-47	8.60E-04	1.48E-03	1.73E-05	4.07E-04
200-DV-1	216-B-48	9.09E-04	1.56E-03	1.80E-05	4.25E-04
200-DV-1	216-B-49	1.49E-03	2.56E-03	2.95E-05	6.96E-04
200-DV-1	216-B-5	5.59E-06	9.78E-06	5.61E-08	1.32E-06
200-DV-1	216-B-50	8.95E-07	7.36E-06	2.57E-07	6.41E-06
200-DV-1	216-B-57	2.69E-06	2.21E-05	7.72E-07	1.92E-05
200-DV-1	216-B-7A&B	2.49E-03	4.68E-04	1.61E-05	3.79E-04
200-DV-1	216-B-8	1.15E-04	1.99E-04	2.14E-06	5.04E-05
200-DV-1	216-B-9	1.76E-05	3.04E-05	3.54E-07	8.32E-06
200-DV-1	216-S-13	7.36E-04	1.61E-03	1.01E-04	2.24E-03
200-DV-1	216-S-21	7.99E-06	4.23E-05	1.73E-06	3.96E-05
200-DV-1	216-S-9	2.99E-05	5.40E-05	4.00E-06	8.84E-05
200-DV-1	216-T-14	6.02E-05	1.04E-04	1.26E-06	2.96E-05
200-DV-1	216-T-15	6.23E-05	1.07E-04	1.30E-06	3.06E-05
200-DV-1	216-T-16	6.10E-05	1.05E-04	1.28E-06	3.00E-05
200-DV-1	216-T-17	4.70E-05	8.08E-05	9.82E-07	2.31E-05
200-DV-1	216-T-18	2.26E-06	4.15E-06	1.89E-08	5.29E-07
200-DV-1	216-T-19	4.53E-05	7.80E-05	9.42E-07	2.21E-05
200-DV-1	216-T-21	2.77E-05	4.77E-05	5.79E-07	1.36E-05
200-DV-1	216-T-22	9.21E-05	1.59E-04	1.93E-06	4.53E-05
200-DV-1	216-T-23	8.89E-05	1.53E-04	1.86E-06	4.37E-05
200-DV-1	216-T-24	9.21E-05	1.59E-04	1.93E-06	4.53E-05
200-DV-1	216-T-25	1.79E-04	3.08E-04	3.74E-06	8.78E-05
200-DV-1	216-T-26	2.45E-05	4.48E-05	2.04E-07	5.72E-06

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-DV-1	216-T-3	3.27E-06	5.73E-06	3.29E-08	7.74E-07
200-DV-1	216-T-32	1.15E-04	1.97E-04	2.32E-06	5.45E-05
200-DV-1	216-T-5	6.74E-05	1.16E-04	1.40E-06	3.30E-05
200-DV-1	216-T-6	3.23E-06	5.65E-06	3.24E-08	7.64E-07
200-DV-1	216-T-7	9.86E-04	1.70E-03	2.04E-05	4.79E-04
200-EA-1	200-E-103	2.22E-13	1.96E-12	5.72E-14	1.45E-12
200-EA-1	200-E-25	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	200-E-41	1.90E-12	6.10E-12	1.47E-13	3.63E-12
200-EA-1	200-E-54	1.11E-11	9.81E-11	2.87E-12	7.28E-11
200-EA-1	200-E-56	1.07E-02	1.15E-03	6.14E-05	1.45E-03
200-EA-1	200-E-57	1.61E-02	1.72E-03	9.21E-05	2.17E-03
200-EA-1	200-E-68	2.19E-13	3.72E-13	3.61E-14	8.96E-13
200-EA-1	200-E-82	2.21E-13	3.76E-13	3.67E-14	9.13E-13
200-EA-1	200-E-94	3.58E-11	8.87E-11	1.76E-12	4.30E-11
200-EA-1	200-E-95	8.55E-10	1.47E-09	1.71E-11	4.04E-10
200-EA-1	216-A-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-10	3.70E-02	2.09E-01	8.98E-03	2.18E-01
200-EA-1	216-A-15	1.25E-11	2.12E-11	1.43E-12	3.49E-11
200-EA-1	216-A-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-2	8.09E-05	9.68E-04	1.90E-05	5.02E-04
200-EA-1	216-A-20	1.24E-07	2.11E-07	4.13E-09	1.09E-07
200-EA-1	216-A-21	2.46E-03	4.28E-03	2.63E-04	6.15E-03
200-EA-1	216-A-22	2.15E-15	3.67E-15	7.18E-17	1.90E-15
200-EA-1	216-A-26	2.17E-13	1.91E-12	5.58E-14	1.42E-12
200-EA-1	216-A-26A	5.56E-14	4.90E-13	1.45E-14	3.67E-13
200-EA-1	216-A-27	3.09E-05	5.15E-05	5.56E-06	1.36E-04
200-EA-1	216-A-28	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-A-3	2.57E-08	4.29E-08	4.63E-09	1.14E-07
200-EA-1	216-A-30	2.32E-08	1.26E-07	5.03E-09	1.27E-07
200-EA-1	216-A-36A	2.36E-03	3.90E-03	4.20E-04	1.03E-02

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-EA-1	216-A-36B	6.27E-05	1.16E-04	1.75E-05	4.47E-04
200-EA-1	216-A-37-1	6.02E-05	1.04E-04	1.30E-05	3.26E-04
200-EA-1	216-A-37-2	9.96E-06	1.84E-05	2.78E-06	7.11E-05
200-EA-1	216-A-4	5.15E-06	8.59E-06	9.27E-07	2.27E-05
200-EA-1	216-A-40	3.00E-11	1.83E-10	5.60E-12	1.40E-10
200-EA-1	216-A-41	4.04E-08	1.52E-07	9.12E-09	2.15E-07
200-EA-1	216-A-45	3.33E-04	9.45E-04	1.40E-04	3.56E-03
200-EA-1	216-A-5	1.98E-02	2.36E-01	4.64E-03	1.23E-01
200-EA-1	216-A-6	1.35E-03	1.62E-02	3.16E-04	8.38E-03
200-EA-1	216-A-9	4.28E-05	7.30E-05	1.43E-06	3.79E-05
200-EA-1	216-B-10A	2.38E-07	4.10E-07	4.85E-09	1.14E-07
200-EA-1	216-B-10B	1.07E-12	9.36E-12	2.73E-13	6.97E-12
200-EA-1	216-B-12	7.18E-06	1.24E-05	1.47E-07	3.45E-06
200-EA-1	216-B-51	2.50E-07	4.31E-07	5.10E-09	1.20E-07
200-EA-1	216-B-55	3.78E-08	2.31E-07	7.07E-09	1.77E-07
200-EA-1	216-B-59	1.51E-11	9.21E-11	2.82E-12	7.07E-11
200-EA-1	216-B-6	1.48E-07	2.56E-07	2.94E-09	6.95E-08
200-EA-1	216-B-62	1.15E-04	5.94E-04	2.72E-05	6.53E-04
200-EA-1	216-B-63	2.10E-05	3.65E-05	4.62E-06	1.16E-04
200-EA-1	216-BY-201	9.25E-06	1.59E-05	1.83E-07	4.33E-06
200-EA-1	216-C-1	7.09E-05	7.59E-06	4.06E-07	9.60E-06
200-EA-1	216-C-10	2.84E-05	3.04E-06	1.63E-07	3.84E-06
200-EA-1	216-C-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-3	1.42E-05	1.52E-06	8.13E-08	1.92E-06
200-EA-1	216-C-4	5.60E-06	8.48E-07	8.10E-08	1.97E-06
200-EA-1	216-C-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	216-C-6	1.53E-05	2.64E-06	2.45E-07	5.88E-06
200-EA-1	216-C-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-EA-1	UPR-200-E-117	1.14E-06	5.88E-06	2.69E-07	6.47E-06
200-EA-1	UPR-200-E-40	2.57E-07	4.26E-07	4.58E-08	1.13E-06
200-EA-1	UPR-200-E-9	9.63E-06	1.66E-05	1.97E-07	4.62E-06
200-IS-1	UPR-200-W-2	4.65E-07	8.13E-07	4.67E-09	1.10E-07

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-IS-1	UPR-200-E-145	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-E-3	1.97E-08	3.40E-08	4.13E-10	9.70E-09
200-IS-1	UPR-200-E-7	1.64E-08	2.82E-08	3.41E-10	8.01E-09
200-IS-1	UPR-200-E-77	1.31E-09	2.29E-09	1.32E-11	3.10E-10
200-IS-1	UPR-200-E-78	2.18E-05	2.34E-06	1.25E-07	2.96E-06
200-IS-1	UPR-200-E-79	8.17E-07	1.41E-06	1.66E-08	3.91E-07
200-IS-1	UPR-200-E-84	7.80E-08	9.33E-07	1.83E-08	4.84E-07
200-IS-1	UPR-200-E-86	2.24E-04	1.08E-03	5.29E-05	1.26E-03
200-IS-1	UPR-200-W-102	2.18E-07	3.76E-07	4.54E-09	1.07E-07
200-IS-1	UPR-200-W-130	7.67E-09	1.29E-08	1.22E-09	2.97E-08
200-IS-1	UPR-200-W-131	3.50E-09	6.02E-09	7.14E-11	1.68E-09
200-IS-1	UPR-200-W-135	2.72E-06	4.68E-06	5.65E-08	1.33E-06
200-IS-1	UPR-200-W-21	7.96E-06	1.37E-05	1.66E-07	3.89E-06
200-IS-1	UPR-200-W-28	5.34E-07	9.20E-07	1.09E-08	2.56E-07
200-IS-1	UPR-200-W-29	2.26E-07	3.90E-07	4.74E-09	1.11E-07
200-IS-1	UPR-200-W-32	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-IS-1	UPR-200-W-38	5.53E-06	9.52E-06	1.15E-07	2.70E-06
200-IS-1	UPR-200-W-97	4.27E-08	7.36E-08	8.89E-10	2.09E-08
200-IS-1	UPR-200-W-98	1.25E-08	2.18E-08	1.25E-10	2.95E-09
200-OA-1	2101-M-Pond	4.31E-07	7.32E-07	8.02E-08	1.99E-06
200-OA-1	216-S-10P	3.71E-02	6.25E-02	7.20E-03	1.79E-01
200-OA-1	216-S-19	8.12E-07	1.38E-06	1.28E-07	3.10E-06
200-OA-1	216-S-26	4.87E-08	8.99E-08	1.36E-08	3.48E-07
200-OA-1	216-T-1	6.19E-08	1.06E-07	2.90E-09	6.97E-08
200-OA-1	216-W-LWC	5.84E-06	1.02E-05	1.33E-06	3.36E-05
200-PW-1	216-Z-1%2stripped	3.87E-01	6.53E-01	6.15E-02	1.50E+00
200-PW-1	216-Z-1&2	4.27E-02	7.24E-02	5.80E-03	1.42E-01
200-PW-1	216-Z-12	5.74E+00	9.70E+00	6.94E-01	1.70E+01
200-PW-1	216-Z-12stripped	1.02E-02	1.73E-02	3.21E-04	8.39E-03
200-PW-1	216-Z-12vit	1.03E-01	1.73E-01	1.63E-02	3.98E-01
200-PW-1	216-Z-18	6.80E-01	1.15E+00	1.08E-01	2.64E+00
200-PW-1	216-Z-18stripped	2.88E-02	4.87E-02	4.59E-03	1.12E-01

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-PW-1	216-Z-1A	3.32E+00	5.61E+00	5.28E-01	1.29E+01
200-PW-1	216-Z-3	5.87E-01	9.99E-01	1.70E-02	4.42E-01
200-PW-1	216-Z-9	2.28E-01	3.86E-01	7.05E-03	1.84E-01
200-PW-1	216-Z-9mined	8.03E-03	1.36E-02	2.52E-04	6.59E-03
200-PW-1	216-Z-9stripped	8.03E-03	1.36E-02	2.52E-04	6.59E-03
200-PW-1	241-Z-361	2.95E+00	5.00E+00	2.99E-01	7.36E+00
200-PW-3	216-A-24	1.42E-04	2.70E-04	8.55E-06	2.12E-04
200-PW-3	216-A-31	1.22E-05	4.65E-05	2.86E-06	6.69E-05
200-PW-3	216-A-7	9.85E-05	3.75E-04	2.31E-05	5.39E-04
200-PW-3	216-A-8	2.79E-04	6.42E-04	3.33E-05	8.06E-04
200-PW-6	216-Z-10	8.33E-03	1.46E-02	8.37E-05	1.97E-03
200-PW-6	216-Z-5	5.30E-02	9.28E-02	5.32E-04	1.25E-02
200-PW-6	216-Z-8	2.23E-05	3.79E-05	7.01E-07	1.83E-05
200-PW-6	241-Z-8	2.23E-05	3.79E-05	7.01E-07	1.83E-05
200-SW-2	216-C-9	1.67E-07	4.18E-07	1.81E-08	4.21E-07
200-SW-2	216-T-4A	1.15E-07	1.98E-07	2.35E-09	5.53E-08
200-WA-1	200-W-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-42	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	200-W-9	3.23E-09	5.57E-09	6.60E-11	1.55E-09
200-WA-1	200-W-PP	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-1&2	8.96E-03	1.49E-02	2.75E-04	6.77E-03
200-WA-1	216-S-12	1.31E-05	2.17E-05	4.01E-07	9.87E-06
200-WA-1	216-S-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-20	2.63E-02	4.50E-02	1.13E-03	2.87E-02
200-WA-1	216-S-22	4.62E-12	1.46E-11	5.11E-13	1.17E-11
200-WA-1	216-S-23	1.61E-09	5.08E-09	1.77E-10	4.06E-09
200-WA-1	216-S-25	3.74E-09	6.91E-09	1.04E-09	2.67E-08
200-WA-1	216-S-3	5.18E-07	2.79E-06	1.13E-07	2.57E-06
200-WA-1	216-S-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-S-5	1.83E-06	7.84E-06	1.56E-07	3.79E-06
200-WA-1	216-S-6	2.07E-05	3.49E-05	7.46E-07	1.80E-05
200-WA-1	216-S-7	6.27E-03	1.05E-02	2.14E-04	5.20E-03

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-WA-1	216-S-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-T-12	2.99E-07	5.15E-07	6.26E-09	1.47E-07
200-WA-1	216-T-2	1.48E-07	2.55E-07	2.95E-09	6.95E-08
200-WA-1	216-T-20	7.09E-09	1.22E-08	1.44E-10	3.39E-09
200-WA-1	216-T-27	1.23E-03	2.14E-03	1.32E-04	3.08E-03
200-WA-1	216-T-28	8.33E-03	1.45E-02	9.03E-04	2.11E-02
200-WA-1	216-T-29	9.19E-10	1.58E-09	1.87E-11	4.40E-10
200-WA-1	216-T-33	4.46E-11	9.02E-11	1.37E-12	3.30E-11
200-WA-1	216-T-34	1.78E-03	2.94E-03	3.17E-04	7.79E-03
200-WA-1	216-T-35	3.09E-03	5.11E-03	5.50E-04	1.35E-02
200-WA-1	216-T-36	1.91E-11	1.68E-10	5.00E-12	1.27E-10
200-WA-1	216-T-8	1.20E-09	2.07E-09	2.45E-11	5.75E-10
200-WA-1	216-U-1&2	3.31E-06	5.70E-06	6.75E-08	1.59E-06
200-WA-1	216-U-12	3.91E-12	3.43E-11	1.01E-12	2.57E-11
200-WA-1	216-U-13	2.70E-10	4.65E-10	5.52E-12	1.30E-10
200-WA-1	216-U-14	1.12E-06	2.01E-06	1.52E-07	3.69E-06
200-WA-1	216-U-15	1.75E-08	3.01E-08	3.56E-10	8.38E-09
200-WA-1	216-U-16	8.25E-09	1.52E-08	2.29E-09	5.87E-08
200-WA-1	216-U-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-4	7.34E-09	1.27E-08	1.47E-10	3.46E-09
200-WA-1	216-U-4A	2.39E-04	4.01E-04	3.80E-05	9.26E-04
200-WA-1	216-U-4B	1.26E-05	2.13E-05	1.74E-06	4.23E-05
200-WA-1	216-U-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	216-U-7	3.88E-13	3.42E-12	1.00E-13	2.54E-12
200-WA-1	216-U-8	8.90E-09	2.03E-08	5.09E-10	1.17E-08
200-WA-1	216-Z-13	4.04E-11	6.82E-11	5.96E-12	1.46E-10
200-WA-1	216-Z-14	4.24E-11	7.16E-11	6.28E-12	1.53E-10
200-WA-1	216-Z-15	4.31E-11	7.28E-11	6.28E-12	1.53E-10
200-WA-1	216-Z-16	2.37E-03	4.00E-03	3.77E-04	9.19E-03
200-WA-1	216-Z-17	8.55E-04	1.44E-03	1.36E-04	3.32E-03

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
200-WA-1	216-Z-21	1.60E-09	2.70E-09	2.54E-10	6.21E-09
200-WA-1	216-Z-4	3.42E-04	5.98E-04	3.43E-06	8.09E-05
200-WA-1	216-Z-6	8.42E-04	1.47E-03	8.46E-06	1.99E-04
200-WA-1	216-Z-7	3.31E-01	5.80E-01	3.34E-03	7.88E-02
200-WA-1	UPR-200-W-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-103	2.07E-04	3.50E-04	3.30E-05	8.04E-04
200-WA-1	UPR-200-W-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-163	4.13E-13	9.68E-13	2.47E-14	5.70E-13
200-WA-1	UPR-200-W-19	2.39E-11	4.12E-11	4.88E-13	1.15E-11
200-WA-1	UPR-200-W-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-33	1.66E-09	2.86E-09	3.45E-11	8.11E-10
200-WA-1	UPR-200-W-39	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00
200-WA-1	UPR-200-W-95	9.78E-08	4.31E-07	7.97E-09	1.96E-07
WMA-A-AX	216-A-16	6.80E-12	5.99E-11	1.76E-12	4.48E-11
WMA-A-AX	216-A-17	3.34E-12	2.94E-11	8.68E-13	2.20E-11
WMA-A-AX	216-A-23A	6.32E-10	1.08E-09	6.51E-11	1.58E-09
WMA-A-AX	216-A-23B	5.91E-10	1.01E-09	5.44E-11	1.31E-09
WMA-A-AX	216-A-39	7.19E-08	2.73E-07	1.68E-08	3.93E-07
WMA-A-AX	241-A-103	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	241-A-104	1.34E-05	7.06E-05	3.16E-06	7.61E-05
WMA-A-AX	241-A-105	2.33E-04	1.38E-03	5.46E-05	1.32E-03
WMA-A-AX	241-AX-102	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-A-AX	UPR-200-E-117	1.14E-06	5.88E-06	2.69E-07	6.47E-06
WMA-A-AX	UPR-200-E-119	3.50E-10	1.81E-09	8.31E-11	1.99E-09
WMA-B-BX-BY	200-E-60	1.99E-13	1.74E-12	5.07E-14	1.29E-12
WMA-B-BX-BY	241-B-101	1.57E-04	3.85E-05	2.77E-06	6.74E-05
WMA-B-BX-BY	241-B-105	3.66E-04	3.01E-03	1.05E-04	2.62E-03
WMA-B-BX-BY	241-B-106	4.20E-06	2.22E-05	8.30E-07	2.05E-05
WMA-B-BX-BY	241-B-107	9.50E-06	7.05E-05	1.68E-06	4.49E-05
WMA-B-BX-BY	241-B-110**	1.43E-04	7.59E-04	2.98E-05	7.33E-04
WMA-B-BX-BY	241-B-112	0.00E+00	0.00E+00	0.00E+00	0.00E+00

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
WMA-B-BX-BY	241-B-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-B-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BX-101	7.50E-05	2.13E-05	1.37E-06	3.35E-05
WMA-B-BX-BY	241-BX-102*	8.69E-04	7.57E-04	3.25E-05	8.08E-04
WMA-B-BX-BY	241-BX-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-103	2.48E-05	2.04E-04	7.14E-06	1.78E-04
WMA-B-BX-BY	241-BY-107	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	241-BY-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-B-BX-BY	UPR-200-E-105	5.21E-06	8.97E-06	1.09E-07	2.56E-06
WMA-B-BX-BY	UPR-200-E-108	5.33E-07	9.18E-07	1.11E-08	2.61E-07
WMA-B-BX-BY	UPR-200-E-109	1.31E-07	2.26E-07	2.68E-09	6.30E-08
WMA-B-BX-BY	UPR-200-E-110	1.15E-06	1.98E-06	2.41E-08	5.66E-07
WMA-B-BX-BY	UPR-200-E-38	7.94E-05	5.26E-04	1.60E-05	4.00E-04
WMA-B-BX-BY	UPR-200-E-6	2.30E-07	3.96E-07	4.82E-09	1.13E-07
WMA-B-BX-BY	UPR-200-E-73	2.49E-07	4.29E-07	5.18E-09	1.22E-07
WMA-B-BX-BY	UPR-200-E-74	9.15E-13	1.58E-12	1.87E-14	4.39E-13
WMA-B-BX-BY	UPR-200-E-75	2.30E-07	3.96E-07	4.82E-09	1.13E-07
WMA-C	216-C-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-101	3.15E-06	3.73E-05	7.35E-07	1.94E-05
WMA-C	241-C-104	2.08E-06	3.53E-06	6.29E-08	1.63E-06
WMA-C	241-C-105	4.05E-04	3.45E-03	8.60E-05	2.21E-03
WMA-C	241-C-108	3.97E-03	4.26E-04	2.28E-05	5.38E-04
WMA-C	241-C-110	6.89E-07	1.19E-06	1.41E-08	3.30E-07
WMA-C	241-C-111	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-112	4.13E-05	4.43E-06	2.37E-07	5.60E-06
WMA-C	241-C-201	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-202	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-203	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	241-C-204	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-C	UPR-200-E-107	4.38E-09	7.54E-09	8.93E-11	2.10E-09
WMA-C	UPR-200-E-16	1.39E-08	2.35E-08	4.40E-10	1.15E-08

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
WMA-C	UPR-200-E-81	2.04E-05	3.17E-05	1.70E-06	5.25E-05
WMA-C	UPR-200-E-82	3.98E-05	1.89E-04	8.87E-06	2.12E-04
WMA-S-SX	241-S-104	8.24E-06	2.21E-05	7.78E-07	2.12E-05
WMA-S-SX	241-SX-104	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-107	2.15E-04	5.68E-04	2.69E-05	6.07E-04
WMA-S-SX	241-SX-108	1.05E-03	3.32E-03	1.19E-04	2.73E-03
WMA-S-SX	241-SX-109	2.30E-05	6.37E-05	2.82E-06	6.38E-05
WMA-S-SX	241-SX-110	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-S-SX	241-SX-111	3.00E-05	1.33E-04	4.24E-06	1.05E-04
WMA-S-SX	241-SX-112	2.61E-04	1.41E-03	5.69E-05	1.30E-03
WMA-S-SX	241-SX-113	8.37E-05	3.69E-04	6.82E-06	1.68E-04
WMA-S-SX	241-SX-114	2.28E-05	5.69E-05	2.99E-06	6.71E-05
WMA-S-SX	241-XS-115	2.46E-04	6.16E-04	3.19E-05	7.20E-04
WMA-S-SX	316-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-101	2.00E-04	9.55E-04	3.74E-05	8.65E-04
WMA-T	241-T-102	3.59E-05	1.16E-05	7.16E-07	1.74E-05
WMA-T	241-T-103	2.91E-05	4.33E-05	1.60E-06	3.93E-05
WMA-T	241-T-106	5.35E-03	7.68E-03	2.83E-04	6.98E-03
WMA-T	241-T-108	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-109	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-T	241-T-111	1.28E-07	2.21E-07	2.67E-09	6.27E-08
WMA-TX-TY	241-TX-104	5.60E-07	9.81E-07	5.63E-09	1.33E-07
WMA-TX-TY	241-TX-105	5.98E-05	1.03E-04	1.14E-06	2.67E-05
WMA-TX-TY	241-TX-114	4.97E-05	2.81E-04	1.06E-05	2.59E-04
WMA-TX-TY	241-TX-118	1.24E-05	7.01E-05	2.66E-06	6.47E-05
WMA-TX-TY	241-TY-104	9.94E-06	5.62E-05	2.13E-06	5.18E-05
WMA-TX-TY	241-TY-105	3.60E-05	6.21E-05	7.36E-07	1.73E-05
WMA-TX-TY	241-TX-107	9.22E-06	5.20E-05	1.97E-06	4.79E-05
WMA-TX-TY	241-TY-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-TX-TY	241-TY-103	2.56E-05	1.45E-04	5.49E-06	1.33E-04
WMA-TX-TY	241-TY-106	7.42E-06	1.28E-05	1.52E-07	3.56E-06
WMA-TX-TY	UPR-200-W-100	5.76E-07	9.91E-07	1.20E-08	2.83E-07

OPU Name	WIDS-Site-Name	Americium 243 [Ci]	Curium 242 [Ci]	Curium 243 [Ci]	Curium 244 [Ci]
WMA-TX-TY	UPR-200-W-12	4.02E-09	6.92E-09	8.18E-11	1.92E-09
WMA-TX-TY	UPR-200-W-127	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WMA-U	241-U-101	1.44E-04	6.36E-04	1.17E-05	2.89E-04
WMA-U	241-U-104	2.79E-06	4.89E-06	2.80E-08	6.61E-07
WMA-U	241-U-110	2.59E-05	1.43E-04	5.27E-06	1.28E-04
WMA-U	241-U-112	5.10E-04	2.25E-03	4.15E-05	1.02E-03
WMA-U	UPR-200-W-132	1.36E-06	2.34E-06	2.83E-08	6.64E-07
WMA-U	UPR-200-W-24	5.19E-09	9.09E-09	5.21E-11	1.23E-09
* Scaled for UNH solubility of the 1951 o					
** matched leak volume bounds					

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Appendix K

Software Installation and Checkout Form

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CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:
Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:
Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: GoldSim Pro Software Version No.: 11.1.5

EXECUTABLE INFORMATION:

2. Executable Name (include path):

   \GoldSim.exe

3. Executable Size (bytes):

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

   Compiled by vendor

5. Operating System (include version number):

   Windows

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

   INTERA 00799

7. Operating System (include version number):

   Windows 10 Pro

8. Open Problem Report? ◉ No ○ Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

   \General Examples

10. Procedure(s):

    per CHPRC-00224 Rev 1, GoldSim Pro Software Test Plan

11. Libraries:

    N/A

12. Input Files:

    FirstModel.gsm

13. Output Files:

    FirstModel.gsm

14. Test Cases:

    GS-ITC-1

15. Test Case Results:

    Match expected results as presented in CHPRC-00224, GoldSim Pro Software Test Plan

16. Test Performed By: U Zaher

17. Test Results: ◉ Satisfactory, Accepted for Use ○ Unsatisfactory

18. Disposition (include HISI update):

    Accepted; installation added to Hanford Off-Site user list

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: GoldSim Pro Software Version No.: 11.1.5

Prepared By: WILLIAM NICHOLS (Affiliate) Digitally signed by WILLIAM NICHOLS (Affiliate) Date: 2018.05.07 13:52:53 -07'00'

19.	WE Nichols	
Software Owner (Signature)	Print	Date

20. Test Personnel:

	U Zaher	
Sign	Print	Date
Sign	Print	Date
Sign	Print	Date

Approved By:

21.	N/R per SMP	
Software SME (Signature)	Print	Date

A-6005-149 (REV 0)