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Hanford 241-A and 241-AX Farm Tank and Ancillary Equipment Residual Waste Inventory Estimates

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Abstract: This report presents estimated tank and ancillary equipment residual waste inventories after waste is retrieved from tanks in Waste Management Area (WMA) A-AX at the Hanford Site. These inventory estimates were developed in support of future environmental assessments and closure decisions and will be updated as additional information is obtained. This report will provide supporting information for the WMA A-AX residual inventory working session in support of the WMA A-AX performance assessment.

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EXECUTIVE SUMMARY

The purpose of this report is to provide radiological and non-radiological inventory estimates for waste residuals in tanks and ancillary equipment in the Waste Management Area (WMA) 241-A and 241-AX Tank Farms (WMA A-AX) at the time of closure. These inventory estimates will be used as source terms for 241-A and 241-AX Tank Farms risk assessments for retrieval and for the WMA A-AX performance assessment and are expected to be revised as additional information is obtained.

This report estimates residual inventories based on information available and conditions through December 1, 2014 and presents chemical and radiological inventory estimates for residual waste that would be remaining in WMA A-AX single-shell tanks (SSTs) and associated transfer equipment after tank waste is retrieved. Residual inventory estimates are important to environmental assessments and closure decisions as most environmental impacts are linearly proportional to the amount of soluble contaminants left in tanks/equipment (this document) or the amount of contaminant released to the soil

Inventories used in Alternative 2B of the Tank Closure and Waste Management (TC & WM) Environmental Impact Statement (EIS) will be used as a point of comparison for the WMA A-AX performance assessment to the TC & WM EIS. Alternative 2B reflects the U.S. Department of Energy's preferred alternative for landfill closure of tank farms. These estimates are based on information and conditions as of December 2002. Residual waste inventory estimates in the EIS were determined by multiplying the inventory estimate for a tank on December 1, 2002 by a factor of 0.01 (99% retrieval assumed). Inventory estimates and descriptions of the EIS are reported in DOE/EIS-0391, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*.

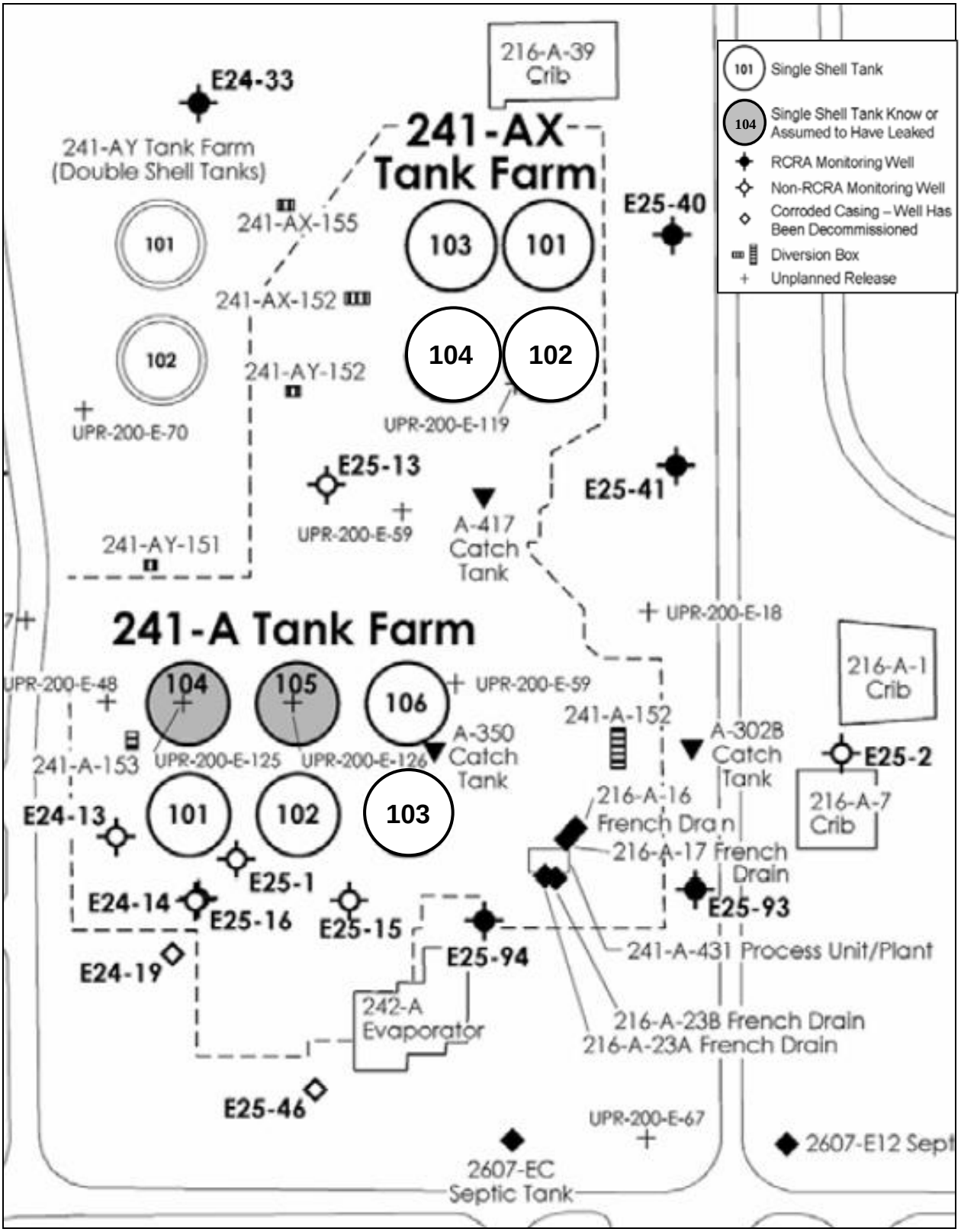
Figure ES-1 shows major components of WMA A-AX expected to contain residual waste including:

- Six SSTs in 241-A Farm and four SSTs in 241-AX Farm used for waste retrieval and storage and

- Ancillary equipment, including catch tanks, pipelines, pits and diversion boxes used to transfer waste to and from the SSTs.

The WMA A-AX SSTs were constructed to store process waste from Hanford nuclear operations. Millions of gallons of nuclear waste were stored in the WMA A-AX tanks. In the late 1990s and early 2000s liquid waste was pumped out of the tanks, reducing the inventory of soluble constituents in the drainable liquid and mobile constituents in the tanks. Waste retrieval operations are planned to remove the remaining waste from the SSTs to the limit of technology. As of December 1, 2014, waste has not been removed from any of the tanks .

Figure ES-1. Location Map of Waste Management Area A-AX



After waste is retrieved, residual waste will be sampled and a more complete inventory set will be available. Following retrieval, the SSTs, infrastructure and surrounding soils, referred to as WMA A-AX, will be closed in accordance with applicable State and Federal regulations. WMA A-AX will be the second tank farm complex closed at the Hanford Waste Site.

This report presents post-retrieval residual waste inventory estimates for SSTs and associated ancillary equipment in the 241-A and 241-AX Tank Farms based on information available as of December 1, 2014.

The Best-Basis Inventory process was established to estimate current tank waste inventories for a standard set of chemicals and radionuclides. In the Best-Basis Inventory process, waste concentration and volume estimates are established and combined to calculate inventories. Available analytical data are evaluated to identify which data best represent the waste concentrations in a tank. When analytical data are not available for a chemical or radionuclide, waste concentrations are estimated based on waste process information. Waste volume estimates in the Best-Basis Inventory are based on tank measurements and/or waste transfer information.

The Best-Basis Inventory estimates are input to the Hanford Tank Waste Operations Simulator model to project residual inventories if tanks are retrieved to a threshold volume of 360 ft^3. The Hanford Tank Waste Operations Simulator model simulates retrieval operations considering the mobility and composition of waste and retrieval fluids to estimate the waste residual inventories after retrieval. As such, it provides a rigorous approach to estimate residual inventories compared to estimates based on simple percentage of waste currently in the tanks and differentiates between soluble and insoluble constituents.

Because little information is available for waste in ancillary equipment, including catch tanks, pits, diversion boxes and pipelines, it was assumed that average Hanford Tank Waste Operations Simulator residual waste concentrations in 241-A and 241-AX Farm SSTs are representative of the waste in ancillary equipment. Waste volumes for catch tanks were estimated based on measurements. However, the amount of waste remaining in pipelines, pits and diversion boxes is unknown. Based on operations information, most of the waste has been flushed from the pipelines. Hence, the residual waste volume in pipelines is expected to be small compared to catch tank and SST post-retrieval residuals. A volume estimate for pipelines was developed based on the length and size of pipelines in the farms and operations information.

This report describes the assumptions, technical basis and uncertainty associated with WMA A-AX residual waste inventories and presents inventory estimates. The uncertainty of estimates varies depending on the quality and completeness of available information and includes retrieval uncertainties, model and process knowledge uncertainties, analytical uncertainty, and residual volume uncertainties.

Table ES-1 shows residual volume, and chemical and radionuclide inventory estimates for 241-A and 241-AX Tank Farms. The Appendices provide inventory estimates and standard deviations for each tank, each catch tank, and for the set of pipelines for 25 chemicals and 46 radionuclides reported in Hanford Tank Waste Operations Simulator and for additional chemicals and radionuclides for tank waste for which analytical results are available.

Table ES-1. Estimated Waste Management Area A-AX Inventories

Inventory Estimates	Updated Estimates		
	Volume (kL)	Chemicals (kg)	Radionuclides (Ci)[d]
241-A Tank Farm			
Best-Basis Inventory, current tank waste	3,180	3.09E6	9.87E6
HTWOS projected tank residuals [a]	61.2	5.46E4	1.57E5
Catch tank and Vault residuals [b]	6.32	5.64E3	1.63E5
Diversion Boxes/ Valve Pits [c]	0.04	35	1.00E3
Pipelines [c]	23	2.05E4	5.92E5
241-AX Tank Farm			
Best-Basis Inventory, current tank waste	1,900	1.83E6	4.92E6
HTWOS projected tank residuals [a]	40.8	3.17E4	1.76E6
Catch tank and Vault residuals [b]	1.17	910	5.07E4
Diversion Boxes/ Valve Pits [c]	0.03	23	1.25E3
Pipelines [c]	19	1.48E4	8.21E5

[a] Assumes a retrieval goal based on retrieval results for other tanks and in-process results for these tanks; it appears that the retrieval goal of 360 ft^3 or less will not be met for these tanks.
[b] Assumes 90% retrieval for catch tanks and vaults.
[c] Waste volume and inventory estimates for pits, diversion boxes and 25% full pipelines (assumes no retrieval).
[d] Radionuclides are decayed to January 1, 2020 for closure assessments.

HTWOS = Hanford Tank Waste Operations Simulator

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LIST OF TERMS

Abbreviations and Acronyms

BBI	best-basis inventory
CFR	*Code of Federal Regulations*
COI	constituent of interest
DOE	U.S. Department of Energy
DQO	data quality objective
DST	double-shell tank
EIS	environmental impact statement
FFTF	Fast Flux Test Facility
HDW	Hanford Defined Waste
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
HTWOS	Hanford Tank Waste Operations Simulator
IMUST	inactive miscellaneous underground storage tank
PCB	polychlorinated biphenyl
PNNL	Pacific Northwest National Laboratory
PUREX	Plutonium Uranium Extraction (Plant)
RCRA	*Resource Conservation and Recovery Act of 1976*
RE	rare earth
REDOX	Reduction-Oxidation (S Plant)
RSD	relative standard deviation
SD	standard deviation
SST	single-shell tank
TS	Sample Based Template

wt%	weight percent
WAC	*Washington Administrative Code*
WMA	Waste Management Area

Waste Type

A1-SltCk	Saltcake from the first 242-A Evaporator campaign using 241-A-102 feed tank (1977-1980)
A2-SltSlr	Salt slurry from the 242-A campaign using 241-AW-102 feed tank (1981-1988)
AR	Water washed PUREX sludge entrained in decants of recovered sludge or the water washes of this sludge and the solids remaining after acidification (1967-1976)
B	B Plant high-activity waste – RE fission products, recovered current acid waste, solvent wash waste, and any solution containing high activity (including cask station receipts, cell drainage containing product spills) (1963-1972)
P1	PUREX high-level waste (1956-1962)
P2	PUREX high-level waste (1963-1967)
R-SltCk	Saltcake from self concentration in 241-S and 241-SX Tank Farms (1952-1966)
S1-SltCk	Saltcake from the first 242-S Evaporator campaign using 241-S-102 feed tank (1973-1976)
S2-SltSlr	Salt slurry from the 242-S campaign using 241-SY-102 feed tank (1977-1980)
SRR	High-activity waste from B Plant processing of PUREX acidified sludge, solids centrifuged from AR Vault feed, strontium purification wastes after solvent extraction, rare earth carrier precipitation (RE) or ion exchange rework, and other solutions containing activity (including cask station receipts, cell drainage containing product spills, Waste Encapsulation and Storage Facility returns unsuitable for rework and crude RE disposal) (1969-1985)
T2-SltCk	Saltcake from the last 242-T Evaporator campaign (1965-1976)

1. INTRODUCTION

1.1 OVERVIEW

This report provides updated inventory estimates for waste residuals remaining in 241-A and 241-AX Farm tanks and ancillary equipment after retrieval is completed. The estimates are based on knowledge of tank farm inventories as of December 1, 2014. Current knowledge includes waste volume measurements and estimates, analysis of tank samples and process knowledge estimates of tank waste composition. Projected residual estimates are the assumed amount of waste and the composition of waste remaining in tanks and ancillary equipment after retrievals are completed.

Residual inventory estimates are important to environmental assessments and closure decisions as most environmental impacts are linearly proportional to the amount of contaminant left in tanks/equipment (this document) or the amount of contaminant released to the soil. Inventories used in Alternative 2B of the Tank Closure and Waste Management (TC & WM) Environmental Impact Statement (EIS) will be used as a point of comparison for the Waste Management Area (WMA) A-AX performance assessment to the TC & WM EIS. Assumptions and bases for inventory estimates in the TC & WM EIS are presented in Section 1.3. Inventory estimates are reported in DOE/EIS-0391, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*.

This report describes the assumptions, technical basis and uncertainty for updated residual waste inventory estimates. Chapter 1 presents an overview and background for the report. Chapter 2 presents the purpose and scope of the report. Inventory estimates were determined for constituents identified in data quality objectives (DQOs) and a 241-C Tank Farm (C Farm) characterization work plan for which sample data or process knowledge concentration estimates were available. Assumptions and constituents of interest (COIs) identified in DQOs are presented in Chapter 3. Chapter 4 describes the technical basis and inventory estimates for C Farm tanks as of December 1, 2014. Residual waste inventory estimates for tanks retrieved to date and projections for tanks to be retrieved are presented in Chapter 5. Also presented in Chapter 5 are inventory estimates for other C Farm facilities (catch tanks, diversion boxes, and pipelines). The uncertainty of estimates presented varies depending on the quality and completeness of available information and includes retrieval uncertainties, model and process knowledge uncertainties, analytical uncertainty, and residual volume uncertainties. Chapter 6 discusses inventory uncertainty.

1.2 BACKGROUND

1.2.1 Description of 241-A and 241-AX Tank Farms

The 241-A and 241-AX Tank Farms are located within WMA A-AX in the 200 East Area of the Central Plateau of the Hanford Site (Figure 1-1). Figure 1-2 shows WMA A-AX and surrounding facilities. The 241-A Tank Farm (A Farm) was constructed between 1953 and 1955.

The 241-AX Tank Farm (AX Farm) was constructed between 1963 and 1965. The tanks in A Farm were designed for the storage of boiling waste generated from irradiated fuel reprocessing at the 202-A Plutonium Uranium Extraction (PUREX) Plant. The tanks in AX Farm were designed to contain liquid and solid wastes at a maximum temperature of 350 °F (RPP-10435, *Single-Shell Tank System Integrity Assessment Report*, pp. A-43). Wastes at higher temperatures could cause buckling of the steel liner and/or damage to the concrete shell. The tanks in A Farm have three unique design features which are airlift circulators for cooling the boiling wastes, an underground vessel ventilation header to remove condensate and volatiles, and laterals 10 ft beneath the tank for leak detection. The tanks in AX Farm had similar design features incorporating leak detection within the tank structure.

In A Farm the heat generated from the decay of radionuclides was sufficient to result in the evaporation of water from the wastes stored in the tanks. The water vapor and other off-gases were drawn from each tank through an underground 20-in.-diameter pipe that connects to an underground 24-in.-diameter pipe (i.e., vapor header). A similar vapor header was installed for the four tanks in AX Farm. An underground 20-in.-diameter pipe connects from each single-shell tank (SST) to an underground 24-in.-diameter pipe. The underground 24-in.-diameter pipe runs to the 241-AX-152 diverter station. From the 241-AX-152 diverter station, the underground 24-in.-diameter pipe from the 241-AX vapor header connects to the A Farm vapor header.

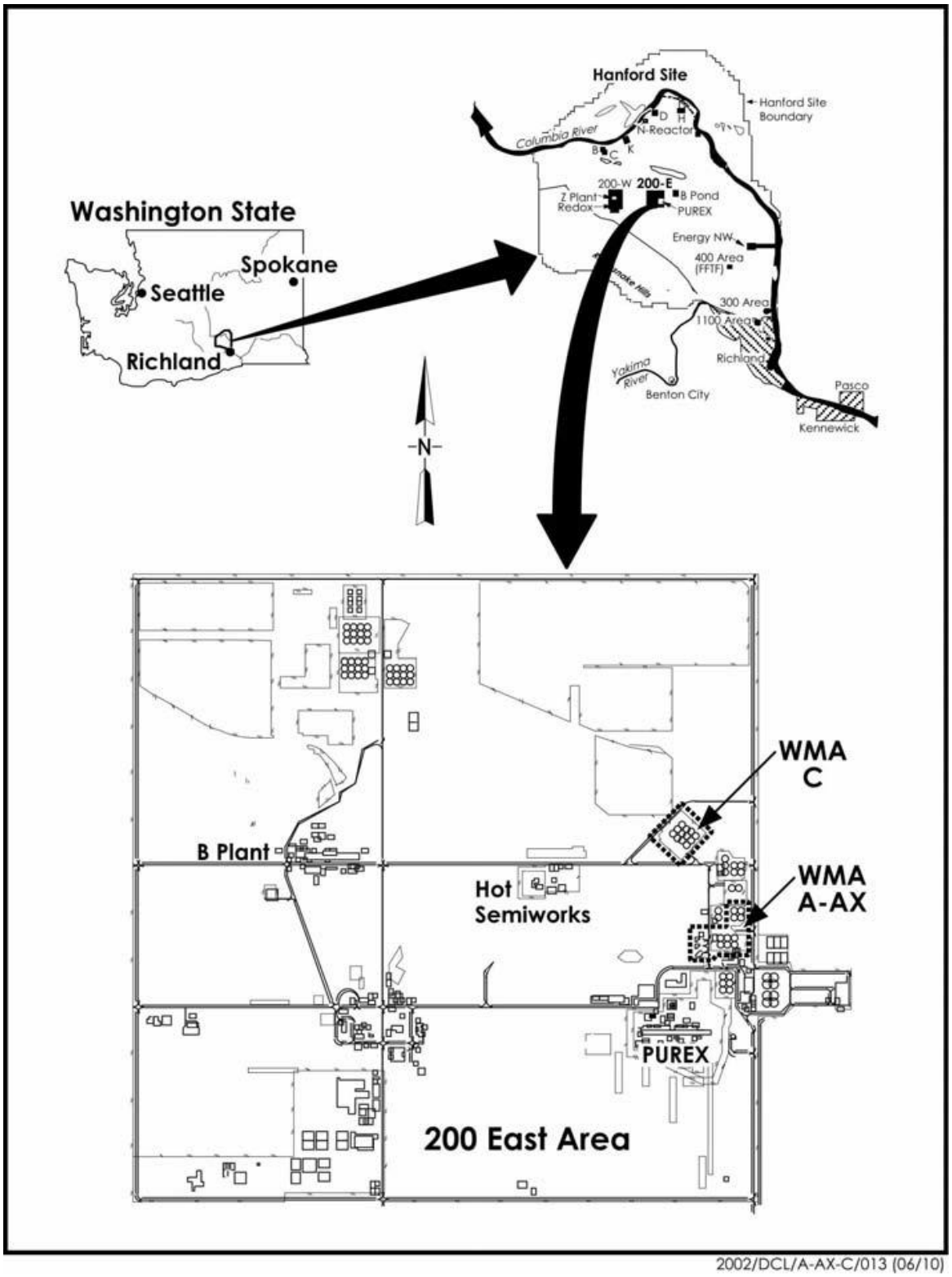
The A Farm vapor header connects to underground condensers and de-entrainment vessels and then enters the 241-A-431 fan house and de-entrainment building. The 241-A and 241-AX Tank Farm Process Condensate was removed from the 241-A and 241-AX Tank Farm off-gases and collected in tank 241-A-417. The off-gas was filtered and discharged through an exhaust stack. Initially, the condensate collected in tank 241-A-417 was either returned to 241-A or 241-AX Farm SSTs or discharged to a crib.

1.2.2 241-A Farm Tanks

The 241-A Tank Farm contains six nominally 1,000,000-gal capacity SSTs, as shown in Figure 1-3 (H-2-31880, *241-A Tank Farm Leak Detection System Plan-Section-Detail*). The tanks consist of a 75-ft diameter, carbon steel liner inside a concrete tank. The tank steel bottoms intersected the sidewalls orthogonally, rather than the dished bottoms of earlier designed tank farms. The concrete thickness is 0.5 ft on the tank bottom, 2 ft to 1.25 ft on the side walls, and 1.25 ft for the tank dome. The concrete tank dome thickness increases to ~3.5 ft along the sidewalls. Each tank was originally equipped with 9 to 11 risers and a 20-in.-diameter vapor exhaust pipeline that penetrated the tank dome and 4 airlift circulators that were operated to suspend solids, mix the tank contents, and dissipate heat.

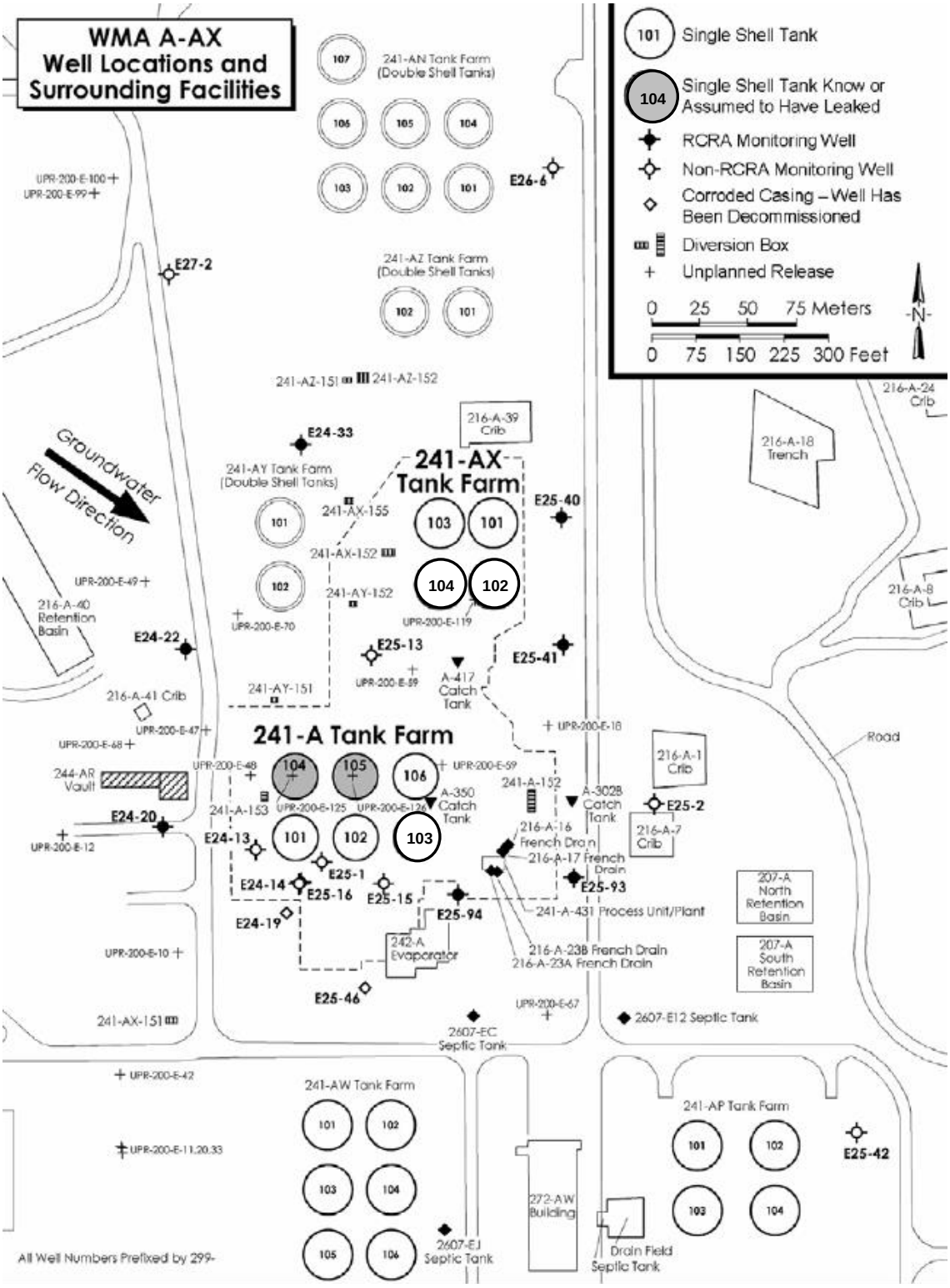
The tanks in A Farm were originally designed to contain liquid and solid wastes at a maximum temperature of 280 °F (RPP-10435, pp. A-42). After installing airlift circulators, the operating temperature limit was revised to a maximum of 300 °F at the tank bottom (RPP-10435, pp. A-54). Wastes at higher temperatures could cause buckling of the steel liner and/or structural damage to the concrete shell.

Figure 1-1. Location Map of Waste Management Area A-AX in the 200 East Area of the Hanford Site



FFTF = Fast Flux Test Facility
PUREX = Plutonium Uranium Extraction (Plant)
REDOX = Reduction-Oxidation (S Plant)
WMA = Waste Management Area

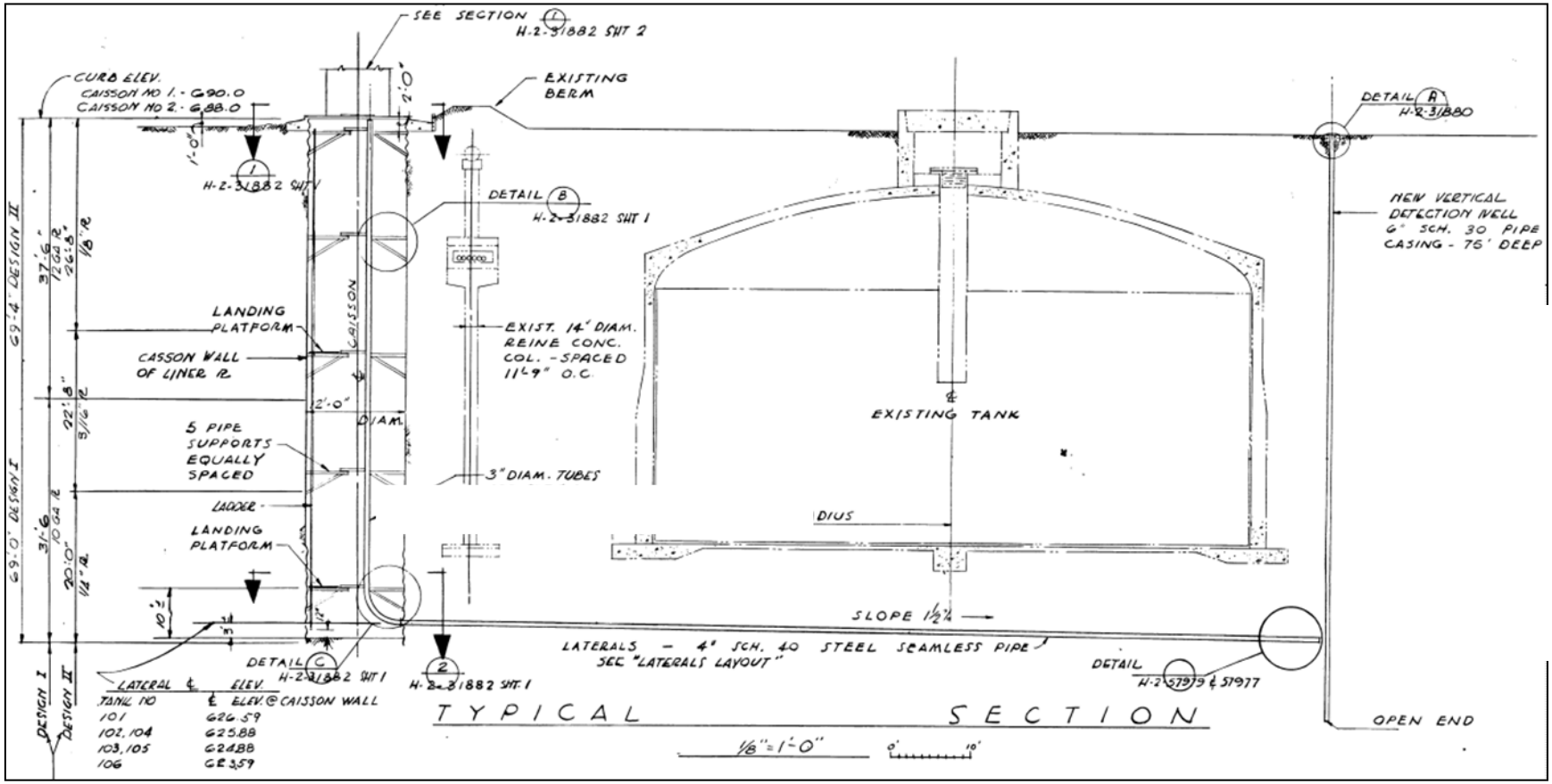
Figure 1-2. Location Map of Waste Management Area A-AX and Surrounding Area



Note: Recent assessments concluded that tanks 241-A-103, 241-AX-102 and 241-AX-104 did not leak. Dashed lines show perceived Waste Management Area (WMA) A-AX boundary lines.

RCRA = *Resource Conservation and Recovery Act of 1976*

Figure 1-3. 241-A Farm Single-Shell Tanks and Laterals



Source: H-2-31880, *241-A Tank Farm Leak Detection System Plan-Section-Detail*.

The tanks in A Farm were vented to an underground vessel ventilation header that connected to tanks in AX Farm and later to 241-AY Tank Farm (AY Farm). The purpose of the ventilation header was to remove off-gas and water vapor from tanks, which were often operated with the wastes at boiling conditions. The tanks in A Farm were isolated from the ventilation header in the early 1980s.

The design of the ventilation header included a baffled, 20-in.-diameter pipe inside each tank. The 20-in.-diameter pipe that exits the tank is connected to a 24-in.-diameter, stainless steel pipe header that is buried a minimum of 4 ft below grade. The 24-in. header ran between the tanks to the 241-A-431 ventilation building. Dresser couplings provide a compression seal on the outer surface of vapor header piping segments that are ~25 ft in length. A Dresser coupling is also used to seal the 20-in.-diameter pipe from each tank to the 24-in. main vapor header. The couplings provide for expansion and contraction of the vapor header pipe segments. For additional detail and information for A Farm see RPP-35484, *Field Investigation Report for Waste Management Areas C and A-AX* or RPP-ENV-37956, *Hanford 241-A and 241-AX Tank Farms Leak Inventory Assessment Report*.

1.2.3 241-AX Farm Tanks

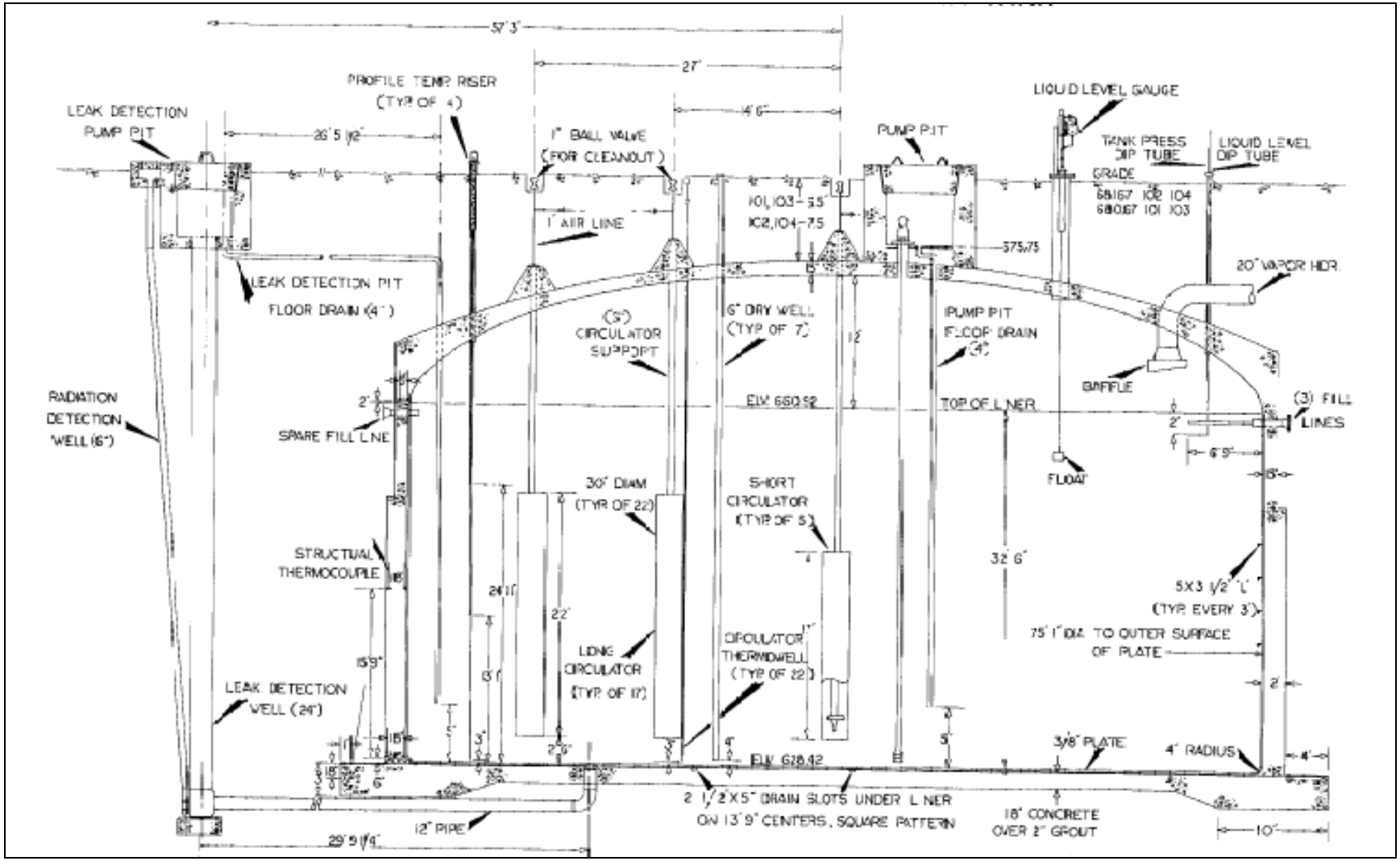
The 241-AX Tank Farm contains four 1,000,000-gal capacity SSTs. A cross section of a tank is shown in RL-SEP-9, *PUREX 241-AX Tank Farm and Waste Routing System Information Manual* and Figure 1-4. The AX Farm tanks consist of a 75-ft-diameter carbon steel liner inside a concrete tank. The tank steel bottoms intersected the sidewalls orthogonally (similar to the tanks in A Farm and 241-SX Tank Farm), rather than the dished bottoms of earlier designed tank arms. The concrete thickness is 1.5 ft on the tank bottom, 2 ft to 1.25 ft on the side walls, and 1.25 ft for the tank dome. The concrete tank dome thickness increases to ~5 ft along the sidewalls. Each tank was equipped with 54 risers that penetrated the tank dome and 22 airlift circulators that were operated to suspend solids, mix the tank contents, and dissipate heat (see Figure 1-4).

The tanks in AX Farm were vented to an underground vessel ventilation header that connected to A Farm and later to AY Farm. The purpose of this ventilation header was to remove offgas and water vapor from these tanks, which were often operated with the wastes at boiling conditions. Section 4.5.2 includes further discussion on the vessel ventilation header and analyses of samples of condensate collected from this system.

The design of this ventilation header included a baffled, 20-in.-diameter pipe inside each AX Farm tank. The 20-in.-diameter pipe exiting the tank is connected to a 24-in.-diameter, stainless steel pipe header that is buried a minimum of 4 ft below grade. The 24-in. header ran between the tanks to the 241-AX-152 diverter station and then to A Farm to tie in to that farm's ventilation header. The 241-AX ventilation header slopes upward toward the A Farm tie-in. Dresser couplings, similar to those in A Farm, provide for expansion and contraction of the vapor header pipe segments.

For additional detail and information for A Farm see RPP-35484 or RPP-ENV-37956.

Figure 1-4. 241-AX Farm Single-Shell Tanks and Leak Detection Pits



1.2.4 241-A and 241-AX Tank Farm Ancillary Equipment

Ancillary equipment in the 241-A and 241-AX Tank Farms are summarized in this section. More detailed descriptions and discussion of the ancillary equipment are provided in numerous references, including:

- DOE/RL-92-04, *PUREX Source Aggregate Area Management Study Report*,
- RPP-35484, *Field Investigation Report for Waste Management Areas C and A-AX*,
- RPP-12051, *244-AR Vault Interim Stabilization Completion Report*,
- RPP-15043, *Single-Shell Tank System Description*, and
- RPP-10466, *Status of Facilities and Waste Transfer Lines Within Single Shell Tank Farms*.

Catch Tanks

The 241-A-350 catch tank is an underground reinforced concrete pump pit, with a cover block. The pump pit drains any releases from the pump through the pump pit floor drain to an 800-gal (3,000-L) stainless steel tank below. The tank is located inside the A Farm fence, southeast of tank A-106. It is designed to receive drainage from the 241-A-A and 241-A-B valve pits, 241-A service pit, 241-A&B flush pits, 241-A cleanout boxes, 241-A-431 ventilation equipment, and out-of-specification 241-A-207 retention basin solution.

The 241-A-417 catch tank is an underground cylindrical concrete vault lined with an all-welded steel liner. Two overflow lines near the top of the vault prevent overflow of the tank. Above the tank are two rectangular pits, a pump pit and a valve pit. The floor of both pits slope to drains that empty to the tank. The tank is located inside the A Farm fence, east of the 241-A-702 Building. The tank collects condensate from the 241-A-401 Condenser House, 241-A-702, and from 241-AZ-154. Condensate may be pumped back to AX Farm or overflow to the 216-A-24 crib.

The 241-A-302B catch tank was used for transfer of waste solutions from processing and decontamination operations to the tank farms and is buried outside the tank farm perimeter fence, east of A Farm, adjacent to Canton Avenue. Shotcrete surrounds the area where the 241-A-302B catch tank is located. A riser and electrical box are visible. A staircase has been installed to provide access to the tank surface. The underground tank is positioned horizontally.

The 241-A-302B catch tank is marked and radiologically posted. The tank received liquid effluents from the 241-A-151 diversion box, located south of PUREX, and the 241-A-152 diversion box, outside the A Farm fence. The tank was isolated in 1985 and interim stabilized in 1990. The volume of waste reported to be remaining in the tank is not consistent in all documents. The Waste Tank Summary Report (HNF-EP-0182, *Waste Tank Summary Report for Month Ending January 31, 2014*) states there is a total of 18,685 L (4,943 gal) of waste remaining in the tank.

The 241-AX-152 catch tank and diverter station are located in the western portion of AX Farm. The catch tank is located under the diverter station. It is constructed of 0.76-meter (2.5-ft)-thick concrete walls. The tank walls and floor are lined with stainless steel. The tank was constructed in 1962 and declared a "leaker" in March 2001. The tank was stabilized by removing all liquid and isolated using both administrative and engineering controls.

204-AR Facility and Catch Tank

The 204-AR Unloading Facility is northwest of the 241-AX-151 diversion box and south of the 244-AR Vault and is a reinforced concrete structure. The structure includes a shielded railcar unloading room, floor drains, a 1,500-gal capacity catch tank enclosed in a stainless steel-lined pit, transfer pumps and four chemical storage tanks. The chemical tanks contained caustic, nitrite and pH buffer solutions. Combined capacity of the catch tank and pit is 4,550 gal.

The 204-AR Facility received railroad tank cars of liquid radioactive waste to be remotely unloaded inside a fully enclosed, heated, and ventilated building. The rail cars were pumped, sampled, and sluiced as needed. When sample results showed the contents of the railroad car or the catch tank did not meet tank farm specifications, chemical adjustments were made inside the rail car or catch tank. Liquids in the catch tank were periodically sent to the tank farm on a batch basis. Liquid in excess of the catch tank capacity overflows into the sump pit, from which it can be pumped to the 241-A-A valve pit. The unit also received wastes generated from decontamination and regeneration operations in the 100 and 200 Areas; from recovery, fuels fabrication, and laboratory operations in the 200 and 300 Areas; and from decontamination operations in the 400 Area. The waste is chemically adjusted in-line during pump-out to double-shell underground storage tanks to meet corrosion specifications.

244-AR Vault

The 244-AR Vault was built in 1966 and is located west of A Farm. Facilities include a canyon building, a service building, two concrete housings, and a change room. The canyon building is a reinforced concrete, two-level, multi-cell structure. The lower process cells contain four tanks and a failed equipment cell, while the upper cells contain the associated piping and equipment. The upper and lower cells are separated by cover blocks with recessed lifting bails.

The unit received waste sluiced from 241-A and 241-AX Tank Farms. Processing took place, then the waste was shipped to B Plant. The facility was the focal point for reprocessing and routing of PUREX-generated waste between the tank farms and B Plant facilities in the late 1960s and between the tank farms and the Waste Encapsulation and Storage Facility in the late 1970s. In 1984, the 244-AR Vault was upgraded for the safe and efficient transferring of PUREX-generated waste between the tank farms and B Plant. The waste consisted of cladding removal waste en route to B Plant and transuranic waste from B Plant/Waste Encapsulation and Storage Facility to the tank farms.

The last documented waste transfer for this site was in 1978. In June 2003, ~18,000 gal of liquid waste were pumped from the vault to the Double-Shell Tank (DST) System. In April and May of 2003, all the pumpable liquid in the facility was consolidated into tank 001 and sampled. In June 2003, ~66,880 L (17,600 gal) of waste and flush water were pumped out of tank 001 and transferred to tank 241-AY-102.

There are an estimated 660 gal of sludge and up to 194 gal of liquid in the tank in tank 001 cell 1 (RPP-12051, pp. 3-2). In tank 002 cell 2, there are an estimated 2,080 gal of sludge and up to 194 gal of liquid (RPP-12051, pp. 3-3). The facility is posted with multiple radiological postings including Internally Contaminated Systems, Radiation Area, Underground Radioactive Material Area, Radiological Buffer Area, Radioactive Material Area, Contamination Area, High Contamination Area, and Fixed Contamination Area.

Diversion Boxes

Diversion boxes are belowgrade, reinforced concrete structures that provide a flexible method of directing liquid waste from a given point to any other given point. The top of the diversion box is a concrete cover block that usually extends abovegrade. Cover blocks vary in thickness from box to box. Some diversion boxes are lined with steel. Transfer lines are connected in the diversion box by installing a jumper between the connecting nozzles. Jumpers either can be fixed or flexible. Jumper installation or removal can be a complex operation requiring a crane to remove and handle the cover block and to install the jumper.

The 241-AX-151 diversion box is an underground reinforced concrete structure located near the corner of 4th Street and Buffalo Avenue, south of the 244-AR Vault facility. There are four diverter tanks (tanks 241-AX-151-D, 241-AX-151-E, 241-AX-151-F and 241-AX-151-G) in individual cells and a catch tank (241-A-151CT) in a pump pit. Each cell has a stainless steel liner on the floor that extends approximately one foot up the wall. The cells and pump pit drain into the catch tank below. The structure is surrounded with posts and chain. It is posted with radiological and Inactive Miscellaneous Underground Storage Tank (IMUST) signs. The unit routed waste from the 202-A Plant to the 244-AR Vault and to the 241-AY and 241-AZ Tank Farms. This unit was isolated by the B-231 project. The last documented waste transfer for this site was in 1977. Gravel was placed on the east and south side slopes in April 2005, to prevent soil erosion.

The 241-AX-152 diverter station, diversion box is a reinforced concrete structure with the top at ground level. There are two diverter tanks in a common cell with a stainless steel liner on the floor that extends ~1 ft up the cell wall. There is also a pump pit that does not have a stainless steel liner. The cell and pump pit drain to a catch tank below.

The 241-AX-152 diverter station is located in the western portion of AX Farm and was used to transfer mixed waste solutions from processing and decontamination operations. The unit was pumped out on August 29, 1992 and declared isolated in March 2002.

The 241-A-152 diversion box is a reinforced concrete structure containing four stainless steel transfer pipes and adequate space to allow for jumper replacement activities. The major portion of the diversion box is below grade with concrete cover blocks and lifting hooks. The diversion box is located inside the A Farm fence, east of tank A-106. The 241-A-152 diversion box routes waste from 241-A-151 diversion box to 241-CR-151 diversion box through a pipe encasement containing four stainless steel lines. Waste transferred through the diversion box includes fuel decladding waste, organic wash waste, sump waste, and laboratory waste. Lead shielding may also be contained inside the diversion box. The last documented waste transfer for this diversion box was May 1980.

The 241-A-153 diversion box is a reinforced concrete structure sized to accommodate the pipes and provide space for jumper replacement. The 241-A-153 is one type of diversion box, known as a transfer box. It connects one common pipe to several others, one at a time, uses only one jumper and has the several nozzles arranged in a circle about the common nozzle. The 241-A-153 diversion box is located inside the A Farm fence, southwest of tank A-104. The 241-A-153 diversion box routes waste from A Farm to the 244-AR Vault and contains PUREX high-level waste and PUREX organic wash waste. Lead shielding may also be contained inside the diversion box. The last documented waste transfer for this site was July 1985. The diversion box has been stabilized with plastic foam to prevent surface infiltration into the unit.

Valve Pits

Valve pits are reinforced concrete structures located below ground that contain valve and jumper assemblies to route the liquid waste through the connected pipelines within a tank farm. Heavy, thick, grade-level blocks cover each of the valve pits. When several tanks are undergoing simultaneous pumping to a single receiver tank, the flow is routed to a valve pit. In the valve pit, the transfer lines of the sending tank are manifolded to the receiver tank line by means of a series of valves and jumper connections. Two- and three-way valves are built into each rigid jumper assembly to divert the flow in the required direction. Waste also can be routed through the valve pit with stainless steel flex jumpers. Each valve pit is equipped with a leak detection that is interlocked to shut down pumps. Each valve pit also has a flush line connected to a flush pit or a drain line connected to an underground storage tank.

The 241-A-A and 241-A-B valve pits were built in 1974 and are underground structures with reinforced concrete walls, floor, and cover blocks located inside the A Farm complex, south of tanks 241-A-101 and 241-A-102. The A Farm valve pits were used to route wastes to and from the 242-A Evaporator; 241-AN, 241-AW, 241-AY, and 241-AZ Tank Farms, PUREX and the 244-A Double-Contained Receiver Tank. The 204-AR Facility was connected to 241-A-A valve pit, but waste was re-routed to 241-AW-A valve pit in 2003 when line LIQW-702 was tied into line SN-220. Transfers from 244-A may have included cross-site, 244-CR, and B Plant wastes.

The 241-AX-A and 241-AX-B valve pits were built in 1965 and are underground reinforced concrete structures with 1-ft-thick walls and floor located inside AX Farm, southwest of tank 241-AX-104. The 241-AX-A and 241-AX-B valve pits were used to direct slurry into tanks or supernate out of tanks and to route waste solutions from processing and decontamination operations.

The 241-AX-501 Valve Pit is a reinforced concrete structure located inside the north end of A Farm that contains a valve that routes AX Farm condensate to the 241-A-417 Pump Pit and tank.

Ion Exchange System

The 241-AX-IX ion exchange system, located in the southern portion of AX Farm, consists of an aboveground filter and ion exchange column. The ion exchange column is enclosed in a shielded structure. The ion exchange column sits on top of an 8-ft concrete structure. The 241-AX-IX ion exchanger is comprised of the exchange column and underground piping. The resin column is located inside a shielded structure that is open at the top. It was installed in 1967 and operated from 1973 to 1976 to remove cesium from the 702-A tank vapor condensate, collected in the

241-A-417 tank. Condensate was pumped from 241-A-417 through the filter and into the top of the ion exchange column. The condensate would gravity flow through the column and normally be discharged to the 218-A-8 crib. During the summer of 2003, field work was performed to isolate the 241-A-417 tank. The drain line from the 241-A-417 tank to the ion exchange column was sealed. The floor drain was covered with foam.

Pipelines

An extensive network of transfer lines connects the various components of the tank farms. Figure 1-5 shows a diagram of a typical transfer system. The 241-A Tank Farm contains at least 121 pipelines with an average 3-in. diameter and total length of 9.1 miles ± 3 miles and a maximum pipe volume of 23,400 gal; AX Farm contains 119 pipelines with a length of 7.9 miles ± 2.3 miles and maximum pipe volume of 19,700 gal (RPP-15043). The construction specifications and hydraulic profiles for the piping system indicate that the lines were generally sloped to allow self drainage (H-2-44502, *Flow Diagram Waste Transfer and Storage Facilities*, Sheet 14). Typically, low point drains in a pipeline feed into a tank. Most lines are out of service. The pipelines were contaminated through use (direct contact with tank waste), but estimates indicate they do not contain significant volumes of waste. Table 1-1 shows pipelines in the 241-A and 241-AX Tank Farms.

1.3 TANK CLOSURE AND WASTE MANAGEMENT ENVIRONMENTAL IMPACT STATEMENT RESIDUAL INVENTORY ESTIMATES

The TC & WM EIS used the December 2002 average BBI estimate for each tank as the assumed composition of residual waste in the 241-A and 241-AX Farm tanks following retrieval. Key enabling assumptions for inventory estimates for Alternative 2B (Note: This Tank Closure alternative reflects DOE's alternative for landfill closure of tank farms) in the TC & WM EIS (DOE/EIS-0391) include the following.

a. Pre-retrieval tank inventories presented were conditions in the farm as of December 1, 2002.

b. Radionuclides were decayed to January 1, 2001, for consistency with BBIs and Hanford Tank Waste Operations Simulator (HTWOS) model results. The TC & WM EIS radionuclide values will be further decayed to January 1, 2020 for the WMA A-AX performance assessment.

c. A 99% retrieval by mass was estimated. This was calculated as 99% of the mass of each chemical constituent and 99% of the activity for each radionuclide in each 241-A and 241-AX Farm tank. The average BBI concentrations for constituents in a tank before retrieval were assumed to represent residual waste concentrations in tanks after retrieval.

d. Waste concentrations in ancillary equipment were assumed to be bounded by the average concentration of waste in 241-A or 241-AX Farm tanks, as applicable. Little concentration data exists for ancillary equipment.

e. The residual waste inventories in pits and pipelines were assumed to remain unchanged after retrieval.

Figure 1-5. Typical Pipeline System in the 241-A and 241-AX Tank Farms

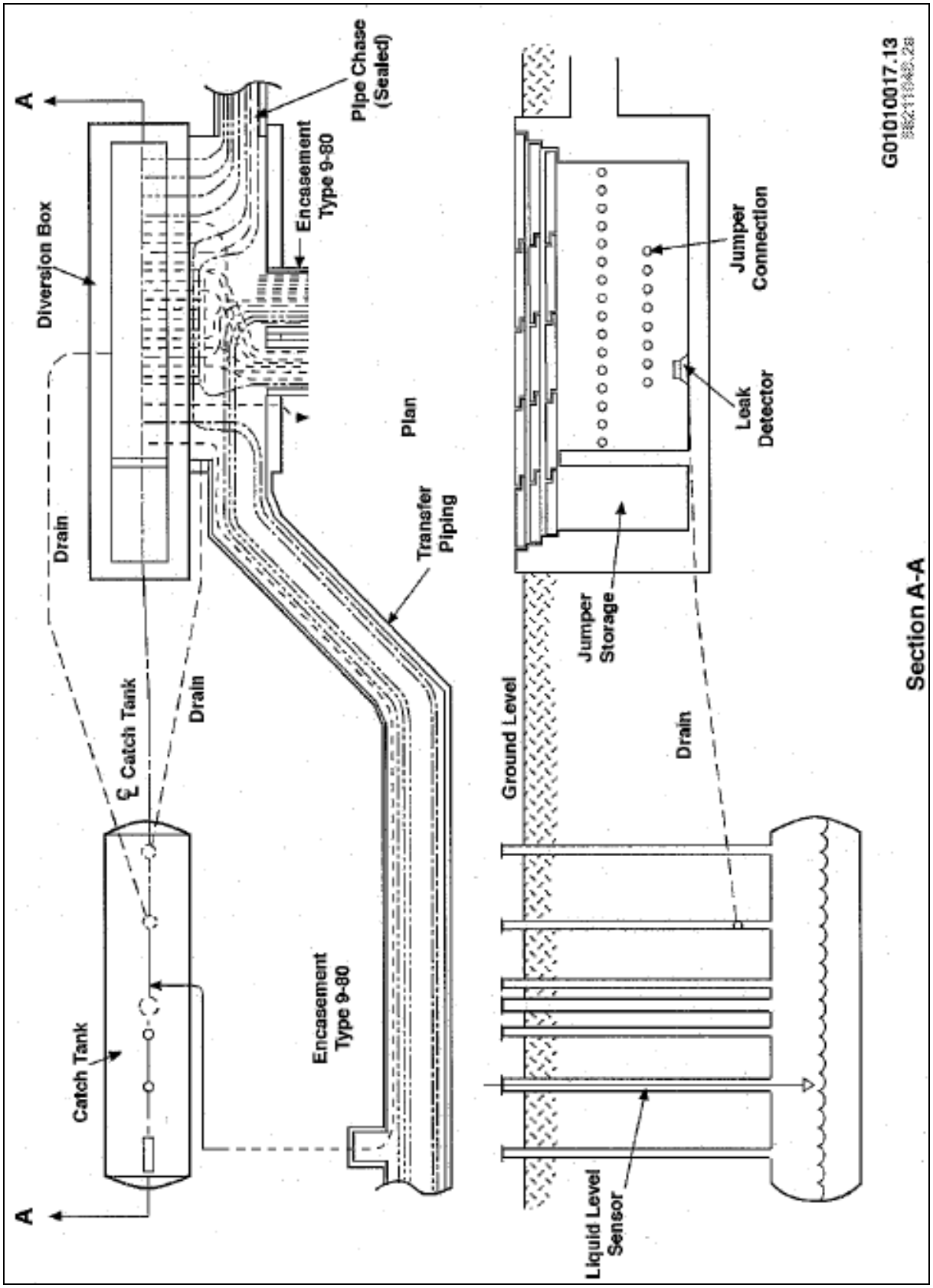


Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
AX	806	244-AR-Vault-T11	241-AY-152-A
A	4001	241-AX-151	Capped
AX	4002	241-AX-151	None Identified
AX	4003	241-AX-151	None Identified
A	4004	241-AX-151	Capped
AX	4005	241-AX-151	Capped
AX	4006	241-AX-151-E Cell	Capped
AX	4007	244-AR Vault-T8A	241-AX-151
AX	4009	241-AX-151	None Identified
AX	4010	241-AX-151-Catch Tank	241-AX-151-F-Cell
AX	4011	241-AX-151-Catch Tank	241-AX-151-E-Cell
AX	4012	241-CR-153	241-AX-151 D-Cell
AX	4013	241-AX-151-D-Cell	241-CR-152-U3A
AX	4014	241-AX-151	Capped
AX	4016	241-AX-151-Catch Tank Pit	241-AX-151-E-Cell
AX	4017	241-AX-151-Washdown	Capped
AX	4018	241-AX-151-Washdown	Capped
AX	4019	241-AX-151	Capped
AX	4020	241-AX-151	Capped
AX	4021	241-AX-151-G-Cell	241-AY-151
AX	4021	241-AY-151	241-AX-152-L2/ 153-AX
AX	4022	241-AX-151-D-Cell	241-AX-152-Pump Pit
	4024	241-AX-152-B	Capped
AX	4026	Jumper Box 153-AX-1	241-AX-101, AX-102
AX	4026	Jumper Box 153-AX-1	241-AX-102-02A-2
AX	4026	Jumper Box 153-AX-1	241-AX-103-03A-2
AX	4026	Jumper Box 153-AX-1	241-AX-104-04A-2
AX	4026	241-AX-101-01A-2	Leak Detection Pits-01E,-02E -03E, -04E
AX	4026	241-AX-152	Jumper Box 153-AX-2
AX	4030	241-AX-152	241-AX-152-B
	4044	241-AX-151-G-Cell	Capped
AX	4101	241-AX-151	241-A-101

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
AX	4102	241-AX-151	241-A-102
AX	4103	241-AX-151	241-A-103
AX	4104	241-AX-151	241-A-104
AX	4105	241-AX-151	241-A-105
AX	4106	241-AX-151	241-A-106
AX	4107		
AX	4530	241-AY-151-U4	241-A-153-U1
AX	8021	241-AY-152-U10	241-AX-103-03D-U3
AX	8022	241-AY-152-U11	241-AX-103-03C-U5
AX	8023	241-AY-152-U14	241-AX-102-02C-U3
AX	8024	241-AY-152-U15	241-AX-102-02D-U5
AX	8025	241-AY-152-U12	241-AX-101-01D-U3
AX	8026	241-AY-152-U13	241-AX-101-01C-U5
AX	8027	241-AY-152-U16	241-AX-104-04C-U3
AX	8028	241-AY-152-U17	241-AX-104-04D-U5
AX	8032	241-AX-104-04D-U3	241-AX-104-04B-U5
AX	8033	241-AX-104-04A-U4	241-AX-104-04B-U3
AX	8034	241-AX-104-04C-U5	241-AX-104-04A-U4A
AX	8036	241-AX-102-02A-U4	241-AX-102-02B-U3
AX	8039	241-AX-101-01A-U9	241-AX-101-01B-U5
AX	8040	241-AX-101-01B-U3	241-AX-101-01D-U5
AX	8041	241-AX-101-01A-U6	241-AX-101-01C-U4
AX	8042	241-AX-102-02C-U5	241-AX-102-02A-U9
AX	8043	241-AX-103-03A-U6	241-AX-103-03C-U4
AX	8044	241-AX-104-04C-U4	241-AX-104-04A-U7
AX	8061	241-AY-152-L7	241-AX-104-04A-U5
AX	8062	241-AX-102-02A-U5	241-AY-152-L6
AX	8063	241-AY-152-L5	241-AX-101-01A-U8
AX	8064	241-AY-152-L4	241-AX-102/241-AX-103
AX	8656	241-AX-151	244-CR DCRT-Tank-003
A	01A	241-A-101-01A-U7	241-A-153-U5
A	01B	241-A-101-01B-U1	241-A-153-L10

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
A	01C	241-A-101-01C-U1	241-A-153-L9
A	02A	241-A-102-02A-U7	241-A-153-U4
A	02B	241-A-102-02B-U1	241-A-153-L11
A	03A	241-A-103-03A-U7	241-A-153-U6
A	03B	241-A-103-03B-U1	241-A-153-L12
A	03C	241-A-103-03C-U1	241-A-153-L7
A	04B	241-A-104-04B-U1	241-A-153-L4
A	04C	241-A-104-04C-U1	241-A-153-L3
AA	05B	241-A-105-05B-U1	241-A-103-03A-U4
A	05C	241-A-105-05C-B	241-A-103-03D, 241-A-153-U2
A	05D	241-A-105-05D-U1	241-A-153-L2
A	06A	241-A-106-06A-U7	241-A-153-U3
A	06B	241-A-106-06B-U1	241-A-153-L5
A	06C	241-A-106-06C-U1	241-A-153-L1
A	153A	241-A-101	241-A-153-Drain
A	4001	PUREX	241-A-B-R12
AX	4002/T031/G026/402A	PUREX	244-AR
AX	4003/T037/4017	PUREX	241-AX-152
AX	4003/T037/4017	202-A	241-AX-152-B
AX	4004/G341/V029	PUREX	241-A-A-L12
AX	4005/810	241-AX-151-D-Cell	244-AR Vault-T9
AX	4006/4018	244-AR Vault-T9A	241-AX-152-A
AX	4107VO33	241-AX-151-D-Cell	241-A-152-U11
AX	4510/A107	241-AX-152-7	Capped
AX	4511		
AX	814/4002/4028/G026/4001/T031	244-AR Vault-TK-001	PUREX
AX	814/4015	241-AX-151	Capped
AX	A101	241-AX-101	241-AX-152
AX	A102	241-AX-102	241-AX-152
AX	A103	241-AX-103	241-AX-152
AX	A104	241-AX-104	241-AX-152
AX	A106		

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
AX	A108		
AX	B101	241-AX-101	241-AX-152
AX	B102	241-AX-102	241-AX-152
AX	B103	241-AX-103	241-AX-152
AX	B104	241-AX-104	241-AX-152
AX	B106		
AX	B108		
AX	C101	241-AX-101	241-AY-501
AX	C102	241-AX-102	241-AY-501
AX	C-103	241-AX-103	241-AY-501
AX	C-104	241-AX-104	241-AY-501
A	D020	PUREX	241-A-151-U19
A	D040	PUREX	241-A-151-U27
A	D070	PUREX	241-A-151-U26
A	D088	PUREX	241-A-151-U-25
A	D149	PUREX	241-A-151-U18
A	D186	PUREX	241-A-151-U5
A	Drain-300		
A	Drain-301	241-A Farm-COBs	241-A-350
A	Drain-304	COB-A-9	DR-301/241-A-350
A	Drain-307	241-A-A-Flush Pit, 241-A-B-Flush Pit	241-A-350
A	Drain-315	COB A-10	DR-317/DR-301/241-A-350
A	Drain-316	COB A-8	DR-301/241-A-350
A	DR-317		
A	Drain-325	COB AX-24	DR325/241-AX-104-Riser-7C
A	E006	PUREX	241-A-151-U24
A	E167	PUREX	241-A-151-U23
A	F241	PUREX	241-A-151-U21
A	F274	PUREX	241-A-151-U9
A	F377	PUREX	241-A-151-U14
A	F429	PUREX	241-A-151-U13
A	F719	PUREX	241-A-151-20

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
A	F791	PUREX	241-A-151-U8
A	Flush Line	241-A-A-Flush Pit	241-A-A-L6,-L8,-L17
A	Flush line	241-A-B-Flush Pit	241-A-102-02B-4
A	Flush Line	241-A-B-R6,-R8,-R17	241-A-B-Flush Pit
AX	Flush Line	241-AX-A-L6,-L8,-L17	241-AX-A-Flush Pit
AX	Flush Line	241-AX-B-R6,-R8,-R17	241-AX-B-Flush Pit
A	G057	PUREX	241-A-151-U17
A	G180	PUREX	241-A-151-U11
A	G212	PUREX	241-A-151-U16
A	M044	PUREX	241-A-151-U10
A	M045	PUREX	241-A-151-U22
A	R165	PUREX	241-A-151-U12
A	R345	PUREX-R8	241-A-151-U15
AX	SL100		
AX	SL101		
A	SL102	241-A-106-06D-A	241-A-B-R7, COB-A8,-A9
A	SL104		
A	SL105	241-A-103-03D-A	241-A-B-R5
A	SL106	241-A-B-R10	241-A-102-02D-A
A	SL107	241-A-01H	241-A-A
AX	SL108	241-AX-01A	241-AX-A
AX	SL109		
AX	SL110		
AX	SL111	241-AX-103-03A-A	241-AX-A-L7
AX	SL112	241-AX-104-04A-A	241-AX-B-R9
A	SN202		
A	SN204		
A	SN205	241-A-103-03C-A	241-A-B-R14
A	SN206	241-A-102-02C-3	241-A-102-02B-3
A	SN207	241-A-A-L14	241-A-101-01B-A
AX	SN208	241-AX-101-01B-A	241-AX-A-L15
AX	SN209	241-AX-102-02D-A	241-AX-B-R14

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
AX	SN210	241-AX-A-L19	241-AX-B-R19
AX	SN211	241-AX-103-03D-A	241-AX-A-L14
AX	SN212	241-AX-104-04B-A	241-AX-B-R15
A	SN-235	241-A-102-02B-2	Capped
A	U039	PUREX	241-A-151-U6
A	U136	PUREX	241-A-151-U7
A	Unknown	241-A-102-02C-U1	241-A-153-L8
A	Unknown	244-AR-Tank-001-T15	244-AR-Tank-004-T4
A	Unknown	241-A-104-04A-U1	241-A-101-01A-U1
A	Unknown	241-A-104-04A-U2	241-A-105-05C-A
A	Unknown	241-A-105-05A-U1	241-A-102-02A-U1
A	Unknown	241-A-106-06A-U1	241-A-103-03A-U1
A	Unknown (02C)	241-A-102-02C-U1	241-A-153-L8
A	V004	241-A-152-U2	241-A-151-L22
A	V005	241-A-152-U8	241-A-151-L21
A	V006	241-A-152-U4	241-A-151-L20
A	V007	241-A-152-U6	241-A-151-L17,-L18,-L19
A	V008	241-A-152-U10	241-A-151-L14,-L15,-L16
A	V021	241-A-151-L25	241-AW-A-L12
A	V027		
A	V028		
A	V032		
A	V038	241-A-152-L6	241-A-101
A	V039	241-A-152-L5	241-A-101
A	V040	241-A-152-L4	241-A-102
A	V041	241-A-152-L3	241-A-102
A	V042	241-A-103	241-A-152-L2
A	V043	241-A-103	241-A-152-L1
A	V044	241-A-152-L10	241-A-104
A	V045	241-A-152-L11	241-A-104
A	V046	241-A-152-L12	241-A-105
A	V047	241-A-152-L13	241-A-105

Table 1-1. 241-A and 241-AX Tank Farm Pipelines (7 sheets)

Farm	Line Number	Connecting Facility	Connecting Facility
A	V048	241-A-106	241-A-152-L14
A	V049	241-A-106	241-A-152-L15
	V050	241-A-152-L7	241-C-104
	V051	241-A-152-L8	241-C-104
A	V052	241-A-152-L9	Capped
	V058	241-A-152-A	241-A-152-A
	V059	241-A-152-B	241-A-152-B
	V060	241-A-152-C	241-A-302B, 241-A-152-C
A	V061	241-A-152-L16	Capped

COB = cleanout box
DCRT = double-contained receiver tank
PUREX = Plutonium Uranium Extraction (Plant)

Reference: RPP-13774, *Single-Shell Tank System Closure Plan*, Addendum 1.

The assumption in the EIS that post-retrieval residual waste concentrations are the same as pre-retrieval concentrations was a simplifying assumption given the limited retrieval experience and uncertainty in the BBI waste concentrations and residual volume estimates before C Farm retrievals started. This assumption will tend to overestimate the remaining soluble and more mobile constituents (for example, groundwater risk drivers such as ^{99}Tc and ^{129}I) that are preferentially removed by sluicing and underestimate the inventory for high density insoluble and less mobile constituents. For additional details and EIS inventory values, see DOE/EIS-0391, Section D.1.1 and DOE/ORP-2003-02, *Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, WA: Inventory and Source Term Data Package.*

For analysis purposes in the TC & WM EIS, the volume of waste in the ancillary equipment for a given tank farm was calculated as the product of total waste volume in ancillary equipment for all farms (3.09E5 gal, given in RPP-15043) times the number of tanks in a given farm (6 for A Farm and 4 for AX Farm) divided by the total number of tanks in the entire SST and DST systems (177) (DOE/EIS-0391, p. D-15).

The waste concentrations in 241-A and 241-AX Tank Farm ancillary equipment were assumed to be the same as average residual waste concentrations in 241-A and 241-AX Farm tanks. The inventories of chemical and radioactive constituents in the ancillary equipment were calculated as the volume of waste in the ancillary equipment times the average BBI concentration of constituents.

2. PURPOSE AND SCOPE

The purpose of this report is to provide radiological and nonradiological inventory estimates for waste residuals in tanks and ancillary equipment in 241-A and 241-AX Tank Farms at the time of closure, to be used as a source term for the performance assessment.

Inventory estimates for tank contents are presented in Section 4.0. Inventories as of December 1, 2014 were developed using the best-basis inventory (BBI) process. The BBI process and basis for current tank waste inventory estimates is described in Section 4.1. Best-basis inventory estimates and uncertainties are included in Appendix A.2. Section 4.2 describes the HTWOS approach used to estimate residual waste inventories in tanks.

The bases for inventory estimates for catch tanks, pipelines, and other ancillary equipment in 241-A and 241-AX Tank Farms are described in Section 5.0, and Section 6.0 discusses uncertainty for tank and ancillary equipment inventory estimates.

This report is limited to inventory estimates for waste contained in tanks and ancillary equipment in the 241-A and 241-AX Tank Farms. Other reports will address soil inventories including leak estimates and unplanned releases, performance assessment modeling, conceptual models, and modeling parameters for waste release and waste transport pathways (including recharge rates, and solubility or K_D factors for residuals and contaminants in soils).

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3. ASSUMPTIONS, CONSTITUENTS OF INTEREST, AND DATA QUALITY OBJECTIVES

3.1 ASSUMPTIONS

Key enabling assumptions for updated inventory estimates include the following.

a. Pre-retrieval tank inventories presented were conditions in the 241-A and 241-AX Tank Farms as of December 1, 2014.

b. Radionuclides were decayed to January 1, 2020. Therefore, the values presented will differ from the 2014 BBI values, which are decayed to January 1, 2008.

c. It was assumed that the minimum volume remaining after retrieval of waste from 241-A and 241-AX Farm tanks would be 10 kL (360 ft^3). This is the threshold limit for 100-series single-shell tanks (SSTs) specified in the *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et al. 1989).

d. The HTWOS model is assumed to provide the best estimates for threshold residual waste inventory estimates for the tanks. These estimates are found in Appendix A.3. The HTWOS assumptions are located in HNF-SD-WM-SP-012, *Tank Farm Contractor Operation and Utilization Plan*.

e. Waste concentrations in ancillary equipment are assumed to be represented by the average HTWOS residual waste concentrations for waste in 241-A Farm and 241-AX Farm tanks.

f. It is assumed that waste in catch tanks and vaults will be retrieved prior to closure (no direction has been given at this time and no limits established). Retrieval of 90% of the waste was assumed.

g. It is assumed that pipelines are 25% full of waste.

3.2 CONSTITUENTS OF INTEREST

The COIs for 241-A and 241-AX Farm tanks are those listed in RPP-23403, *Single-Shell Tank Component Closure Data Quality Objectives*. Tables 3-1 through 3-4 list COIs (primary and secondary constituents) identified in RPP-23403 for tank closure requirements. Inventory estimates in this report are limited to those constituents for which analytical inventory data or process model estimates were available. Additional data will be obtained after tank waste is retrieved.

The COIs in RPP-23403 were identified from: the *Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 8, for the Single-Shell Tank System* (CH2M HILL 2003) (Part A); underlying hazardous constituents; and Title 10, *Code of Federal Regulations*, Part 61,

"Licensing Requirements for Land Disposal of Radioactive Waste," Subpart D—Technical Requirements for Land Disposal Facilities, § 61.55, Waste Classification (10 CFR 61.55).

Table 3-1. Inorganic Constituents

Primary			
Constituent	**Inventory estimate included**	**Constituent**	**Inventory estimate included**
Acetate – $C_2H_3O_2^-$	No	Iron – Fe	Yes
Aluminum – Al	Yes [1]	Lead – Pb	Yes [2]
Ammonium – NH_4^+	No	Manganese – Mn	Yes
Antimony – Sb	Yes [1]	Mercury – Hg	Yes [2]
Arsenic – As	Yes [1,2]	Nickel – Ni	Yes [2]
Barium – Ba	Yes [1,2]	Nitrate – NO_3^-	Yes
Beryllium – Be	Yes [1,2]	Nitrite – NO_2^-	Yes
Cadmium – Cd	Yes [1,2]	Oxalate – $C_2O_4^{2-}$	Yes
Chromium – Cr	Yes [2]	pH	No
Cobalt – Co	Yes [1]	Selenium – Se	Yes [1,2]
Copper – Cu	Yes [1]	Silver – Ag	Yes [1,2]
Cyanide – CN^-	No [2]	Strontium – Sr	Yes
Ferrocyanide – $Fe(CN)_6^{4-}$	No [2]	Thallium – Tl	Yes [1]
Fluoride – F^-	Yes [2]	Uranium – U	Yes
Formate – CHO_2^-	No	Vanadium – V	Yes [1]
Glycolate – $C_2H_3O_3^-$	No	Zinc – Zn	Yes [1]

Secondary					
Constituent[2]		Constituent[2]		Constituent[2]	
Bismuth – Bi	Yes	Niobium – Nb	No	Sodium – Na	Yes
Boron – B	Yes [1]	Palladium – Pd	No	Sulfur – S	No
Bromide – Br^-	Yes [1]	Phosphate – PO_4^{3-}	Yes	Tantalum – Ta	No
Calcium – Ca	Yes	Phosphorus – P	No	Tellurium – Te	No
Cerium – Ce	Yes [1]	Potassium – K	Yes	Thorium – Th	Yes [1]
Europium – Eu	No	Praseodymium – Pr	No	Tin – Sn	No
Lanthanum – La	Yes	Rhodium – Rh	No	Titanium – Ti	Yes [1]
Lithium – Li	Yes [1]	Rubidium – Rb	No	Tungsten – W	No
Magnesium – Mg	Yes	Ruthenium – Ru	No	Yttrium – Y	No
Molybdenum – Mo	Yes [1]	Samarium – Sm	No	Zirconium – Zr	Yes
Neodymium – Nd	Yes [1]	Silicon – Si	Yes		

[1] Inventory provided only for tanks analyzed for this constituent.

[2] Dangerous Waste Constituent, listed in *Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 8, for the Single-Shell Tank System* (CH2M HILL 2003).

Reference: RPP-23403, *Single-Shell Tank Component Closure Data Quality Objectives*, Rev. 5.

Table 3-2. Primary Organic Constituents (no inventory estimates for these)

Constituent[1]	Constituent[1]
1,1,1-Trichloroethane	Chlorobenzene
1,1,2,2-Tetrachloroethene	Chloroform
1,1,2,2-Tetrachloroethane	Dichloromethane (methylene chloride)
1,1,2-Trichloro-1,2,2-trifluoroethane	Ethyl Acetate
1,1,2-Trichloroethane	Ethylbenzene
1,1,2-Trichloroethylene	Diethyl ether
1,1-Dichloroethene	Isobutanol
1,2-Dichloroethane	Methanol
Chloroethene (vinyl chloride)	n-Butyl alcohol (1-butanol)
2-Butanone (MEK)	Toluene
2-Nitropropane	trans-1,3-dichloropropene
2-Propanone (Acetone)	Trichlorofluoromethane
4-Methyl-2-pentanone (MIBK)	Xylenes
Benzene	o-Xylene
Carbon disulfide	m-Xylene
Carbon tetrachloride	p-Xylene
1,2,4-Trichlorobenzene[1]	N-nitroso-di-n-propylamine
2,4-Dinitrotoluene[1]	Ethylene glycol
2,4,5-Trichlorophenol[1]	Fluoranthene[1]
2,4,6-Trichlorophenol[1]	Hexachlorobutadiene[1]
2,6-Bis (tert-butyl)-4-methylphenol[1]	Hexachloroethane[1]
2-Chlorophenol[1]	m-Cresol (3-Methylphenol)[1]
2-Ethoxyethanol[1]	Naphthalene
2-Methylphenol (o-cresol)	Nitrobenzene[1]
4-Methylphenol (p-cresol)	n-Nitrosomorpholine[1]
Acenaphthene	o-Dichlorobenzene[1]
Butylbenzylphthalate[1]	o-Nitrophenol
Cresylic acid (cresol, mixed isomers)[1]	p-Chloro-m-cresol (4-Chloro-3-methylphenol)
Cyclohexanone[1]	Pyrene
Di-n-butylphthalate[1]	Pyridine[1]
Di-n-octylphthalate[1]	Tributyl phosphate

[1] Dangerous Waste Constituent, listed in *Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 8, for the Single-Shell Tank System* (CH2M HILL 2003).

Reference: RPP-23403, *Single-Shell Tank Component Closure Data Quality Objectives*, Rev. 5.

Table 3-3. Secondary Organic Constituents (no inventory estimates for these) (2 sheets)

Constituent	Constituent
cis-1,3-Dichloropropene	p-Nitrochlorobenzene
Ethylene dibromide (1,2, Dibromoethane)[1]	1,4-Dinitrobenzene
Butane	1,4-Dichlorobenzene[1]
1,3-Butadiene	Phenol[1]
Acrolein (propenal)[1]	Hexachlorobenzene[1]
3-Chloropropene (Allyl chloride)[1]	N,N-Diphenylamine
Propionitrile (Ethyl cyanide)[1]	Pentachloronaphthalene
Acrylonitrile[1]	Hexachloronaphtahlene
2-Pentanone	Tetrachloronaphthalene
Methylcyclohexane	Octachloronaphthalene
n-Pentane	Isodrin
5-Methyl-2-hexanone	Benzo[a]pyrene[1]
2-Heptanone	Dibenz[a,h]anthracene[1]
n-Hexane	1,3-Dichlorobenzene[1]
Cyclohexane	3-Methyl-2-butanone
n-Octane	N-Nitroso-N,N-dimethylamine[1]
4-Heptanone	Hexafluoroacetone
Acetic acid, n-butylester	Pentachloronitrobenzene (PCNB)[1]
1,4-Dioxane[1]	Pentachlorophenol[1]
n-Heptane	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)[1]
Cyclopentane	1,1'-Biphenyl
Ethyl alcohol	Acetophenone[1]
2-Propyl alcohol	Toxaphene[1]
n-propyl alcohol (1-propanol)	Nitric acid, propyl ester
Bromomethane[1]	Aldrin[1]
Chloroethane	alpha-BHC[1]
Acetonitrile[1]	beta-BHC[1]
1,1 Dichloroethane[1]	gamma-BHC (Lindane)[1]
Dichlorofluromethane	Dieldrin[1]
Chlorodifluoromethane[1]	Endrin[1]

Table 3-3. Secondary Organic Constituents (no inventory estimates for these) (2 sheets)

Constituent	Constituent
3-Methy-2-butanone	1,1-Dimethylhydrazine[1]
Hexafluoroacetone	Methylhydrazine[1]
2-Butenaldehyde (2-Butenal)	n-Nitrosomethylethylamine
Methyl isocyanate[1]	n-Nitrosodi-n-butylamine
n-Propionaldehyde	Triethylamine[1]
3-Heptanone	Oxirane[1]
Chloromethane[1]	2-Methyl-2-propanol
n-Nonane	Dichlorodifluoromethane[1]
Styrene	1,2-Dichloro-1,1,2,2-tetrafluoroethane
Tetrahydrofuran	Heptachlor[1]
Cyclohexene	1,2-Dichloropropane[1]
2-Methyl-2-propenenitrile	1-Methylpropyl alcohol
2-Hexanone	3-Pentanone

[1] Dangerous Waste Constituent per *Washington Administrative Code* 173-303-9905, "Dangerous Waste Constituents List."

Reference: RPP-23403, Rev. 5, *Single-Shell Tank Component Closure Data Quality Objectives*.

Table 3-4. Primary Radiological Constituents (inventory estimates are available for all of these)

Constituent	Constituent	Constituent
^{137}Cs	^{99}Tc	^{238}Pu
^{60}Co	^{125}Sb	$^{239/240}Pu$
^{152}Eu	^{79}Se	^{241}Pu
^{154}Eu	^{126}Sn	^{241}Am
^{155}Eu	^{233}U	^{242}Cm
^{14}C	^{234}U	^{243}Cm
^{3}H	^{235}U	^{244}Cm
^{129}I	^{236}U	228Th
^{63}Ni	^{238}U	230Th
^{90}Sr	^{237}Np	^{232}Th

Reference: RPP-23403, *Single-Shell Tank Component Closure Data Quality Objectives*, Rev. 5.

3.3 DATA QUALITY OBJECTIVES

The DQO Process (EPA/600/R-96/055, *Guidance for the Data Quality Objectives Process EPA QA/G-4*) is a strategic planning approach based on the Scientific Method to prepare for a data collection activity. It provides a systematic procedure to define the criteria that a data collection design should satisfy, including when to collect samples, where to collect samples, the tolerable level of decision error for the study, and how many samples to collect, balancing risk and cost in an acceptable manner. Thus, the DQO Process establishes the analytical requirements for sample results used in the BBI.

Data quality objectives are qualitative and quantitative statements derived from the outputs of the first six steps of the DQO Process that:

1. Clarify the study objective;

2. Define the most appropriate type of data to collect;

3. Determine the most appropriate conditions from which to collect the data; and

4. Specify tolerable limits on decision errors which will be used as the basis for establishing the quantity and quality of data needed to support the decision.

The DQO Process assures that the type, quantity, and quality of environmental data used in decision making will be appropriate for the intended application, resulting in environmental decisions that are technically and scientifically sound and legally defensible. In addition, the DQO Process guards against committing resources to data collection efforts that do not support a defensible decision.

Appendix I Section 2.1.6 of the HFFACO states, “before tank waste field retrieval activities are initiated, U.S. Department of Energy (DOE) will develop a tank or component specific retrieval data quality objectives (DQO) document for the residual tank waste characterization in coordination with the State of Washington Department of Ecology. As part of the DQO process, DOE will also develop a sampling and analysis plan for post-retrieval and closure sampling.” Similarly, DOE O 435.1, *Radioactive Waste Management* places a requirement on using the DQO Process. Based on the DQOs, sampling and analysis activities were performed in accordance with the following EPA documents:

- EPA/600/R-96/055, *Guidance for the Data Quality Objectives Process EPA QA/G-4*

- EPA/240/B-01/003, *EPA Requirements for Quality Assurance Project Plans EPA QA/R-5*, March 2001 as revised.

The DQOs applied to 241-A and 241-AX Farm tank samples are shown in Table 3-5. After waste is retrieved, the remaining tank waste residuals will be sampled and analyzed in accordance with RPP-23403.

Table 3-5. Data Quality Objectives Applied to 241-A and 241-AX Farm Tank Samples[1] (2 sheets)

Document Topic and Number	Document Title	Document Scope	Tanks where applied
Safety Screening WHC-SD-WM-SP-004	Tank Safety Screening Data Quality Objective	Data needs to determine safe storage of tank waste.	241-A-101, 241-A-102, 241-AX-101, 241-AX-102, 241-AX-103, 241-AX-104
Waste Compatibility HNF-SD-WM-DQO-001	Data Quality Objectives for Tank Farms Waste Compatibility Program	Data needed for waste transfers in the tank farms.	241-A-101, 241-AX-101, 241-AX-102
Criticality Data Quality Objective (DQO) for cores RPP-SPEC-25386	Criticality Data Quality Objectives for Tank Core Samples	Criticality data required from the solid waste portion of tank core samples.	241-A-101, 241-AX-101, 241-AX-103
Polychlorinated biphenyls (PCBs) RPP-7614	Data Quality Objectives to Support PCB Management in the Double-Shell Tank System	Data needed to manage PCBs in double-shell tank system and waste feed to the waste treatment plant.	241-A-101, 241-AX-101
Organic Solvent HNF-SD-WM-DQO-026	Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue	Data needs to resolve the safety issue of organic solvent pools in the tanks.	241-A-101, 241-A-102, 241-AX-101, 241-AX-103, 241-AX-104
Flammable Gas WHC-SD-WM-DQO-004	Flammable Gas Tank Safety Program: Data Requirements for Core Sample Analysis Developed Through the Data Quality Objectives Process	Data needs to resolve flammable gas safety issue.	241-A-101, 241-AX-101, 241-AX-102, 241-AX-103
Historical Data Acquisition Model Verification WHC-SD-WM-DQO-018	Historical Model Evaluation Data Requirements	Data needs supporting the historical model for tank grouping.	241-A-101, 241-AX-101
Organic Complexant WHC-SD-WM-DQO-006	Data Quality Objective to Support Resolution of the Organic Complexant Safety Issue	Data needs to resolve the organic complexant issue.	241-A-101
Vapor Space Phenomenology PNNL-11683	Measurements of Waste Tank Passive Ventilation Rates Using Tracer Gases	Data needs to assess homogeneity and change in vapor space concentrations with time.	241-AX-103
241-AX-104 Waste Characterization HNF-SD-WM-DQO-027	Tank 241-AX-104 Waste Characterization Data Quality Objective	Data needs to assess inventory and leachability of waste for the Hanford Tanks Initiative Project.	241-AX-104

Table 3-5. Data Quality Objectives Applied to 241-A and 241-AX Farm Tank Samples[1] (2 sheets)

Document Topic and Number	Document Title	Document Scope	Tanks where applied
Pretreatment WHC-SD-WM-DQO-022	Data Needs and Attendant Data Quality Objectives for Tank Waste Pretreatment and Disposal	Data needs to support enhanced sludge washing, solids/liquid separation, cesium removal, strontium removal, transuranic waste removal, and technetium removal.	241-A-101

4. TANK INVENTORY ESTIMATES

This section describes the BBI process used to estimate 241-A and 241-AX Tank Farm SST waste inventories prior to retrieval and HTWOS residual tank waste estimates after retrieval. The BBI waste concentrations and volumes are inputs to HTWOS.

4.1 BEST-BASIS INVENTORY

The BBI process uses available information to estimate tank compositions and inventories for DSTs and SSTs at Hanford. Best-basis inventory estimates are determined for each tank by multiplying the concentration of each constituent in a given waste layer by the volume of that layer, and summing over the layers in a tank. The BBI process, described in RPP-7625, *Guidelines for Updating Best-Basis Inventory*, involves the following steps:

1. Review available waste volume and composition information for a tank
2. Estimate waste volumes and concentrations for each waste type within a tank
3. Combine volume and concentration estimates to calculate inventories and uncertainties
4. Document basis for inventory estimates, and
5. Issue inventory estimates and BBI documentation.

The BBI includes inventory estimates for 25 chemicals and 46 radionuclides for all SSTs and DSTs (Table 4-1). Inventories for additional or "supplemental" constituents are also provided for tanks for which analytical data is available. Because sample data is not available for many constituents, the standard constituents in BBI are limited to those constituents included in historical waste process models. The standard analytes account for ~99 weight percent (wt%) of the chemical inventory (not including percent water, free hydroxide, bound hydroxide or oxygen associated with metallic oxides) and the radionuclides account for over 99% of the activity (Ci), in terms of short and long-term risk (WHC-SD-WM-TI-731, *Predominant Radionuclides in Hanford Site Waste Tanks*). Table 4-2 lists supplemental constituents that were included in the BBI as of December 1, 2014 for one or more 241-A or 241-AX Farm tanks.

The BBI is maintained under configuration control and updated on a quarterly basis, as needed, to incorporate new data and waste transfer information. As additional analytical data is obtained, the list of supplemental BBI constituents will be expanded. Inventories and concentrations as of December 1, 2014 for each waste type in each of the 241-A and 241-AX Farm SSTs are provided in Appendix A.2.

4.1.1 Best-Basis Inventory Composition Estimates

Best-basis inventory waste composition estimates are based on:

1. First, sample data, if sample data is available

2. Next, process knowledge (i.e., historical sample data pre-1989, sample data from other tanks that received similar waste types, and isotope calculations)

3. Then, model data based on the information described in Section 4.1.3.

Table 4-1. Standard Best-Basis Inventory Constituents

Constituents		Radionuclides		
Al	Na	^{3}H	^{134}Cs	^{234}U
Bi	Ni	^{14}C	^{137}Cs	^{235}U
Ca	NO_2	^{59}Ni	^{137m}Ba	^{236}U
Cl	NO_3	^{60}Co	^{151}Sm	^{237}Np
CO_3	Oxalate	^{63}Ni	^{152}Eu	^{238}Pu
Cr	Pb	^{79}Se	^{154}Eu	^{238}U
F	PO_4	^{90}Sr	^{155}Eu	^{239}Pu
Fe	Si	^{90}Y	^{226}Ra	^{240}Pu
Hg	SO_4	^{93}Zr	^{227}Ac	^{241}Am
K	Sr	^{93m}Nb	^{228}Ra	^{241}Pu
La	Total organic carbon	^{99}Tc	^{229Th}	^{242}Cm
Mn	U-TOTAL	^{106}Ru	^{231}Pa	^{242}Pu
	Zr	^{113m}Cd	^{232}Th	^{243}Am
		^{125}Sb	^{232}U	^{243}Cm
		^{126}Sn	^{233}U	^{244}Cm
		^{129}I		

Table 4-2. Supplemental Constituents for 241-A and 241-AX Tank Farms[1]

Supplemental Constituents (23)		
Ag	Co	Se
Aroclors (total polychlorinated biphenyl)	Cu	Th
As	Free OH	Ti
B	Li	Total alpha
Ba	Mg	V
Be	Mo	Zn
Cd	Nd	$^{239/240}Pu$
Ce	Sb	

[1]Analyses available for one or more of the 241-A and 241-AX Farm tanks.

An array of concentration values from a single information source (e.g., a sample event or model estimate) is referred to as a vector. Expert judgment is used to determine the BBI waste composition estimates. The value and justification for each estimate is documented in BBI summary reports.

4.1.1.1 Sample Data. All of the 241-A and 241-AX Farm tanks have been sampled. However, sample data representative of current tank contents is not available for all tank and BBI constituents. Since 1990, core samples have been obtained for tanks 241-A-101, 241-AX-101 and 241-AX-103; auger samples for tanks 241-A-102, 241-AX-102 and 241-AX-104; and grab samples for tanks 241-A-101, 241-AX-101 and 241-AX-102. Sampling and analysis of 241-A and 241-AX Farm tanks were driven by needs specified in DQOs (Table 3-5). No samples have been obtained from these tanks since 1998.

Supernatant liquid grab samples are generally assumed to be homogeneous and are taken from one or more risers at multiple depths. Average and standard deviations for the sample sets are derived from grab sample data. Core samples and/or auger samples are taken from two or more risers (ceiling access ports) from opposite sides of the tank in an attempt to account for heterogeneity. For core samples, 19-in. sample segments are obtained. Averages are calculated by first averaging primary and duplicate samples in a segment, then averaging segments representative of a waste type, and finally averaging across multiple risers.

Because inventories cannot be determined for many of the BBI standard analytes based on samples only, process knowledge (Section 4.1.2) and model-based estimates (Section 4.1.3) are needed.

4.1.1.2 Process Knowledge. Process knowledge concentration estimates are derived from:

- historical tank sample data (pre-1989 data),
- sample data from other tanks, and
- isotope calculations.

Historical sample data (pre-1989 data) generally have a lower level of quality assurance/quality control and are therefore considered process knowledge information rather than a sample-based estimate.

Sample-based template values were developed from a review of sample data for tanks with similar process histories and at least one waste layer from the same waste process (i.e., same waste type). The Hanford Site has had many different fuel reprocessing systems that generated many waste streams (WHC-MR-0132, *A History of the 200 Area Tank Farms*). Table 4-3 lists the waste types identified in the BBI as remaining in 241-A and 241-AX Farm tanks. The decision to include tank data in a template was based on tank transfer records indicating the expected waste type and depth in a tank and a comparison with expected analytical concentrations for a given waste type, and is documented in each update of the BBI for that tank. Of the waste types in 241-A and 241-AX Tank Farms, sample templates were only developed for A1-SltCk. Sample templates could not be developed for other waste types in 241-A and 241-AX Tank Farms (AR, B, P1, P2, and SRR) because smaller amounts of these waste types

were added to the tanks and representative sample layers with only these waste types could not be obtained.

Table 4-3. Waste Types in 241-A and 241-AX Farm Tanks

Waste Type	Description	Tanks
A1-SltCk	Saltcake from the first 242-A Evaporator campaign using 241-A-102 feed tank (1977-1980)	241-A-101, 241-A-102, 241-A-103, 241-A-106, 241-AX-101, 241-AX-102, 241-AX-103, 241-AX-104
AR	Water washed Plutonium Uranium Extraction (PUREX) sludge entrained in decants of recovered sludge or the water washes of this sludge and the solids remaining after acidification (1967-1976)	241-A-103, 241-A-104, 241-A-106
B	B Plant high-activity waste – Rare earth (RE) fission products, recovered current acid waste, solvent wash waste, and any solution containing high activity (including cask station receipts, cell drainage containing product spills) (1963-1972)	241-AX-102
P1	PUREX high-level waste (1956-1962)	241-A-104
P2	PUREX high-level waste (1963-1967)	241-A-101, 241-A-105, 241-AX-103, 241-AX-104
SRR	High-activity waste from B Plant processing of PUREX acidified sludge, solids centrifuged from AR Vault feed, strontium purification wastes after solvent extraction, rare earth carrier precipitation (RE) or ion exchange rework, and other solutions containing activity (including cask station receipts, cell drainage containing product spills, Waste Encapsulation and Storage Facility returns unsuitable for rework and crude RE disposal). (1969-1985)	241-A-106, 241-AX-101

Sample templates are described in RPP-8847, *Best-Basis Inventory Template Compositions of Common Tank Waste Layers*. Waste type uncertainties are presented in Chapter 6.

In the absence of specific sample data, some isotope values were estimated from measured values. For example, plutonium, americium and curium isotopes were estimated based on Hanford Defined Waste (HDW) model ratios from total alpha values for similar waste types; uranium isotopes were estimated based on HDW model ratios from total uranium measurements for similar waste types; and ^{137m}Ba and ^{90}Y were decay calculations from measured values for ^{137}Cs and ^{90}Sr, respectively.

4.1.1.3 Hanford Defined Waste Model Composition Estimates. The HDW model composition estimates are used when sample data for a given waste type are not available and when process knowledge estimates cannot be determined. Sample data or sample-based templates are available for most of the standard BBI chemicals. However, sample data data or sample-based templates are not available for many of the standard BBI radionuclides (RPP-19822, *Hanford Defined Waste Model – Revision 5.0*).

The HDW model uses a spreadsheet format to combine tank waste transfer and process information with Hanford Site irradiated fuel and separation plant process records from the Oak Ridge Isotope Generation 2 model (RPP-13489, *Activity of Fuel Batches Processed Through Hanford Separations Plants, 1944 Through 1989*) to produce total chemical and radionuclide compositions by waste type. The HDW model concentration estimates are used in the BBI to fill gaps where sample data or process knowledge data do not exist for a waste type and/or constituent.

4.1.2 Best-Basis Volume Estimates

Information such as surveillance data (e.g., waste surface level measurements, sludge level measurements, liquid observation well measurements), in-tank photographs, core sample extrusion observations, core sample analysis and waste transfer history were evaluated to estimate waste volumes used in the BBI. New volume estimates are documented in tank waste summary reports (HNF-EP-0182). Table 4-4 shows estimated waste phase volumes for each 241-A and 241-AX Farm tank.

Table 4-4. Best-Basis Volume Estimates for 241-A and 241-AX Farm Tanks

Tank	Waste Phase (kL [kgal])[1]			
	Salt Cake Solids	Salt Cake Liquid	Sludge	Supernate
241-A-101	878 (232)	148 (39)	11 (3)	0
241-A-102	106 (28)	33 (9)	0	12 (3)
241-A-103	1,071 (283)	338 (89)	8 (2)	30 (8)
241-A-104	0		102 (27)	0
241-A-105	0		139 (37)	0
241-A-106	110 (29)		189 (50)	0
241-AX-101	1,164 (308)	178 (47)	11 (3)	0
241-AX-102	90 (24)		23 (6)	0
241-AX-103	298 (79)	75 (20)	30 (8)	0
241-AX-104	0		28 (7.5)	0
Total				

4.2 RESIDUAL TANK WASTE INVENTORY ESTIMATES

Residual waste is defined in Appendix H of the HFFACO (Ecology et al. 1989) as

> "Tank waste remaining in the tank after all waste retrieval actions have been completed. Some materials may be excluded from residual waste volume calculations, subject to approval in the closure plan."

The HFFACO Appendix H requires that tanks be retrieved to less than 360 ft^3 for 100-series SSTs and 30 ft^3 for 200-series SSTs or the limit of technology, whichever is lower. Therefore, post-retrieval tank residual inventories were estimated assuming waste is retrieved to a threshold level of 360 ft^3. The HTWOS model was used to simulate the composition and inventory of waste remaining in a tank after a tank is retrieved and when the 241-A and 241-AX Tank Farms are closed.

The HTWOS model is a dynamic flowsheet mass balance model that tracks and predicts the movement of waste from current tank contents through disposal. It establishes the timing of key process steps and the life-cycle system mass balance based on current assumptions.

In simulating the waste treatment mission, the HTWOS model begins with in-tank data from the BBI process. The HTWOS addresses mixing of waste streams, partitioning of streams (evaporators, ion exchange, solid-liquid separation, wash and leach factors or decontamination factors, and a strontium solubility correlation), and certain chemical reactions. The simulation proceeds subject to a variety of constraints such as tank space, vessel volume, production rates, dwell time, and simultaneous retrieval limitations. The model does not explicitly address reaction kinetics, waste speciation, solid-liquid equilibria, heat transfer, equipment reliability, and certain flowsheet details.

The various processes are modeled in sufficient detail to estimate the overall timing of each process and the quantities and composition of the primary and secondary waste streams, taking into account the interactions, including recycle, between the various processes and unit operations. The HTWOS model and validation of the model is further described in RPP-17152, *Hanford Tank Waste Operations Simulator (HTWOS) Version 7.8 Model Design Document*, Rev. 10.

The basis for residual inventories in HTWOS is documented in ORP-11242, *River Protection Project System Plan*. Inventories assumed waste is retrieved to leave 8,500 L (300 ft^3) of residual waste in the 100-series tanks. The waste is assumed to contain 83 wt% water-washed solids with liquids at 5×10^{-4} times the concentration of bulk supernate of the waste. Appendix A.2 contains the residual waste inventory projected by the HTWOS model and documented in SVF-4057, *SVF-4057_R0_Tank_Residuals_MMR-50027_Run2-7.8-8.3r1-2015-02-10-at-03-33-29.xlsm*. Model values are ratioed from 300 ft^3 to 360 ft^3 and radionuclide values shown are back decayed from January 1, 2034 to January 1, 2020.

5. WASTE INVENTORIES IN ANCILLARY FACILITIES

Ancillary equipment in the 241-A and 241-AX Tank Farms are described in RPP-10466. Ancillary equipment includes catch tanks, pits, diversion boxes and pipelines within the SST system. Little waste composition data is available for ancillary equipment estimates. As a result, the average HTWOS tank residual waste composition estimates for A Farm and AX Farm were assumed to represent the residual waste composition in ancillary equipment in A Farm and AX Farm, respectively.

Table 5-1 summarizes residual waste volume estimates for ancillary facilities in the 241-A and 241-AX Tank Farms. The bases for these estimates are provided in the following sections:

- Catch Tanks and Vaults (Section 5.1)
- Pits (Section 5.2)
- Diversion Boxes (Section 5.3)
- Transfer Piping (Section 5.4).

Table 5-1. Ancillary Equipment Waste Volume Estimates

Structure	241-A Tank Farm kL (kgal)	241-AX Tank Farm kL (kgal)
Catch tanks and Vaults	63 (17)	12 (3)
Diversion boxes/Pits	0.04(0.01)	0.03 (0.01)
Transfer piping	23 (6)	19 (5)

Ancillary equipment residual inventory calculations are shown in Appendix A.3.

5.1 CATCH TANKS AND VAULTS

Waste will likely be retrieved from catch tanks and IMUSTs as determined during the closure process. No decision or direction has been given to date regarding removal of waste from ancillary equipment. Therefore, it was assumed (somewhat arbitrarily) that 90% of the current waste volume in catch tanks and IMUSTs will be retrieved. Table 5-2 shows current waste volume estimates for catch tanks and vaults in 241-A and 241-AX Tank Farms.

5.2 VALVE PITS AND DIVERSION BOXES

The estimate for current content of the valve pits and Diversion Boxes will vary during retrieval of tanks. It was assumed that at closure all of the waste will be flushed from the pits except waste adhered to the pit surface. This estimate was determined by multiplying the wetted surface area (sides and bottom) of the pits and diversion boxes by a waste thickness of 0.040 cm (0.0156 in.) times a grout formation factor (void space) of 0.30 (RPP-15043). The estimate is consistent with RPP-RPT-58156, *Basis for Miscellaneous Underground Storage Tanks and*

Special Surveillance Facilities Waste Volumes Published in HNF-EP-0182 Revision 320 "Waste Tank Summary Report for Month Ending August 31, 2014", which indicates that the diversion boxes contain <100 gal of waste.

Table 5-2. Catch Tank and Vault Waste Volume Estimates

Structure	Capacity kL (kgal)	Waste kL (kgal)	Reference
241-A-350 Catch Tank	3.0 (0.8)	0.42 (0.11)	RPP-RPT-58156
241-A-417 Misc Tank	~60 kgal	4.16 (1.1)	RPP-RPT-58156
241-A-302A Catch Tank	32 (8.6)	2.31 (0.61)	RPP-RPT-58156
241-A-302B Catch Tank	51 (13.5)	23.1 (6.1)	RPP-RPT-58156
204-AR Catch Tank	5.7 (1.5)	2.69 (0.71)	RPP-RPT-58156
244-A-TK Catch Tank	62 (16)	19.7 (5.2)	RPP-RPT-58156
244-AR Vault			
Tank 001 Cell 1	43 kgal	2.50 (0.66)	RPP-12051
Tank 002 Cell 2	43 kgal	0.6-7.9 (0.17-2.1)	RPP-12051
Tank 003 Cell 3	4.7 kgal	<0.19 (0.05)	RPP-12051
Tank 004 Cell 3	4.7 kgal	<0.19 (0.05)	RPP-12051
241-AX-151 Catch Tank	46 (12)	10.6 (2.8)	RPP-RPT-58156
241-AX-152 Catch Tank	42 (11)	<0.38 (0.10)	RPP-RPT-58156

References:
RPP-RPT-58156, *Basis for Miscellaneous Underground Storage Tanks and Special Surveillance Facilities Waste Volumes Published in HNF-EP-0182 Revision 320 "Waste Tank Summary Report for Month Ending August 31, 2014"*.
RPP-12051, *244-AR Vault Interim Stabilization Completion Report*.

Table 5-3 shows surface areas and estimated waste volumes for diversion boxes and pits in A Farm and AX Farm.

5.3 PIPELINES

The 241-A Tank Farm contains at least 121 pipelines with an average 3-in. diameter and total length of 9.1 miles ± 3 miles and a maximum pipe volume of 23,400 gal; AX Farm contains 119 pipelines with a length of 7.9 miles ± 2.3 miles and maximum pipe volume of 19,700 gal (RPP-15043). The pipelines were flushed after being used in an attempt to remove residual waste. No discernible residual waste was observed in pipelines studied in 241-SY Tank Farm and about 4% of the pipe volume contained waste in 15- to 18-in. vitrified clay pipes between the 231-Z building and Z Ditches (RPP-PLAN-47559, *Single-Shell Tank Waste Management Area C Pipeline Feasibility Evaluation*) (no pipeline retrieval). However, some lines in A Farm and AX Farm are known to have plugged in the past; some were flushed and unplugged, but some

may have remained plugged and some failed lines were capped and abandoned in place (RPP-ENV-37956, Table 5-2).

Table 5-3. Diversion Box and Pits Waste Volume Estimates

Structure	Approximate Dimensions (L by W by H, ft)	Surface Area (ft^2)	Calculated Waste Volume L (gal)	Reference
241-A-152 Diversion Box	45 by 6 by 12	1,494	17 (4)	H-2-55953
241-A-153 Diversion Box	14 by 6 by 12	480	5 (1)	H-2-61982
241-A-A Valve Pit	10 by 12 by 5	410	5 (1)	H-2-69188, H-2-69150
241-A-B Valve Pit	10 by 12 by 5	410	5 (1)	H-2-69188, H-2-69150
Sum 241-A			39 (10)	
241-AX-152 Diversion Box	16 by 6 by 10	472	5 (1)	H-2-44580
241-A-501 Valve Pit	23 by 14 by 2	746	8 (2)	H-2-56129
241-AX-153 Diversion Box	5 by 5 by 12	230	3 (1)	H-2-33294
241-AX-155 Diversion Box	8 by 6 by 9	276	3 (1)	H-2-90690
241-AY-152 Diversion Box	14 by 13 by 10	764	8 (2)	H-2-64330
241-AX-A Valve Pit	10 by 12 by 5	410	5 (1)	H-2-69188, H-2-69150
241-AX-B Valve Pit	10 by 12 by 5	410	5 (1)	H-2-69188, H-2-69150
241-AX-501 Valve Pit	5 by 3 by 3	63	1 (0.2)	H-2-44607
Sum 241-AX			29 (8)	

References:
H-2-33294, *Isolation Jumper Pit 241-AX-153 241-AX Tank Farm*.
H-2-44580, *Structural-241-AX-152 – Diverter Station Plans & Sections*.
H-2-44607, *Structural & Piping Valve Pit*.
H-2-55953, *Diversion Box 241-A-152 Concrete & Steel Details*.
H-2-56129, *Contact Condenser, 241-A-501 Valve Pit Piping Arrangement*.
H-2-61982, *Structural & Civil Transfer Box 241-A-153 Plans & Details*.
H-2-64330, *Structural Transfer Box 241-AY-152 Plans, Sections, & Details*.
H-2-69150, *Structural Valve Pits 241-A-A & B, 241-AX-A & B*.
H-2-69188, *Piping Plan Valve Pits 241-A-A & B*.
H-2-90690, *Structural Diversion Box 241-AX-155 Plan and Misc Details*.

If as much as 25% of the pipelines were plugged or contained waste there would be ~6,000 gal of waste in A Farm pipes and ~5,000 gal in AX Farm pipes. The volume of waste may be closer to 5% or less, as was assumed for 241-C Tank Farm (C Farm) pipes.

Appendix A.3 shows pipeline inventory estimates by constituent by farm. The estimates were calculated by multiplying the average residual tank waste compositions in A Farm and AX Farm by 25% of the pipe volume in a farm.

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6. INVENTORY UNCERTAINTY

This section summarizes the uncertainty of tank and ancillary equipment residual inventory estimates. Tank volume, composition and inventory uncertainties estimated in the BBI are discussed in Section 5.1. Section 5.2 discusses residual tank inventory uncertainties and Section 5.3 discusses uncertainty in ancillary equipment inventory estimates.

Residual waste that will remain in ancillary equipment is also highly uncertain. As a result, the inventory based on current waste volumes and waste composition (prior to retrieval) was determined as an upper range for tanks and catch tanks. An upper range inventory for pipelines was estimated assuming the pipelines will be completely full of waste at closure.

Best-basis inventory uncertainties for specific tank inventories and constituents are presented in Appendix A.2.

6.1 BEST-BASIS UNCERTAINTY

Inventory uncertainties were divided into three phases: sludge, saltcake, and supernate. For each phase, the equation for the inventory of a constituent is

$$I = C \times D \times V$$

where

I = Inventory
C = Concentration
D = Density
V = Volume

The term “density” is used to denote “Bulk Density” or “Specific Gravity” depending on the waste phase, solid or liquid. In this equation, C denotes constituent concentration, D the density of the waste, and V the volume of the waste in the phase.

The uncertainty in the inventory is calculated in terms of standard deviations (SD). The relative standard deviation (RSD) is the SD divided by the mean; i.e., it is the SD expressed as a percent of the mean. If it is assumed that the three variables C, D, and V are independent of each other, then the RSD^2 of the product is, approximately,

$$RSD^2(I) \cong RSD^2(C) + RSD^2(D) + RSD^2(V)$$

Therefore, the uncertainty of the inventory is a function of the uncertainty (RSD) of each of its components; concentration (C), density (D), and volume (V). For liquids, the RSD associated with density (specific gravity) is omitted from the equation because the concentrations are reported on a volumetric basis (μg/mL or μCi/mL) and the density is not used in calculating the inventory.

6.1.1 Concentration Uncertainty

6.1.1.1 Sample Uncertainty. Sample-based (S) concentration RSDs were less than 0.4 for all constituents (see Appendix A.2). Sample uncertainty estimates are determined for each constituent and sample analyzed considering precision and accuracy of samples. Differences between sample results from two or more locations provide a measure of spacial variability and representativeness of the tank samples. The BBI calculates mean concentrations and RSDs for the constituents in each waste phase based on tank sample data and sample analytical reports. These values are included in the Calculation Detail Reports (Appendix A.2). Radionuclides and chemical constituents with low concentrations tend to have higher RSDs than those with high concentrations. An RSD value of 1 was assigned for "less than" values used.

6.1.1.2 Sample Based Template Uncertainty. A1-SltCk Sample Based Template (TS) values were used for tanks where analytical sample data for A1-SltCk waste were not available or where detection level sample values were lower than TS values. The RSDs for sample-based A1-SltCk templates were calculated based on variability in R-SltCk, T2-SltCk, S1-SltCk, S2-SltSlr, A1-SltCk, A2-SltSlr. Template RSDs ranged from as high as 1.97 for Mn to 0.10; most reported values were < 1. Waste type templates and uncertainties are described in RPP-8847 and uncertainties are included in Appendix A.2.

An RSD value of 1.00 was assumed if more than 50% of concentrations used in a TS calculation for a given constituent are below detection limits or when concentration data were limited to a single detected value that was determined to be reasonable based on comparison to other detection limits and/or the HDW model.

6.1.1.3 Model Based Temple Uncertainty. The uncertainty in model based template concentration estimates for 241-A and 241-AX Farm tank waste is unknown, but may be much higher than for TSs.

6.1.2 Density Uncertainty

The density or specific gravity of the waste is also estimated from tank sample data. However, analytical density/specific gravity measurements were not available for many of the tanks. As a result, pooled RSDs of the density for SST and DST liquids and solids were determined and applied to all tanks. The technique for estimating the RSDs for density is reported in RPP-6924, *Statistical Methods for Estimating the Uncertainty in the Best Basis Inventories*. The density RSDs are given in Table 6-1.

Table 6-1. Relative Standard Deviations for Bulk Density and Specific Gravity by Type of Tank and Waste Phase

Tank and Phase	Method	Relative Standard Deviation (%)
Single-shell tank, liquid	Specific gravity	5.9%
Single-shell tank, solid	Bulk density	7.6%

Pooled density RSDs are generally used to calculate the RSD for the inventories. Sample based RSDs are used when sample data is available.

6.1.3 Volume Uncertainty

Enraf®[1] and zip cord measurements were used to estimate the the volume of waste in 241-A and 241-AX Farm tanks.

Enraf® gauge tracks level changes in tank waste by using a load cell to monitor the weight of a displacer. Enraf® measurements are reported to be within 0.01 in. for a liquid surface (RPP-6570, *Volume Uncertainty Estimates for Hanford Tank Wastes*). However, none of the 241-A or 241-AX Farm tanks have a liquid surface. Consequently, the variability in solid surface level measurements is based on ranges in Enraf®, zip cord and other surface level core profile measurements across a tank surface.

A zip cord measurement is taken with a tape lowered into the tank, and the distance to the waste level is measured. Zip cord measurements are usually taken prior to initiating tank activity, such as core sampling, in a riser.

Waste volume uncertainties are based on the average variability in surface level measurements at different locations within tanks with similar waste surfaces. Tables 6-2 and 6-3 show the tanks included in variability estimates and the range of the surface level readings for these tanks. The 241-A and 241-AX Farm tanks have both saltcake and sludge surfaces. For a sludge surface, the average standard deviation of the surface level readings is 11 cm (4.3 in.) or ~4,500 L (12,000 gal). The volume RSD for each sludge tank not yet retrieved is the standard deviation (4.3 in.) divided by the total depth of waste in the tank. Note that the RSD for volume based on the surface level increases as the volume of waste decreases.

6.1.4 Inventory Uncertainty

The statistical techniques used to combine the inventory estimates for the waste phases and used to combine the RSDs are given in detail in RPP-6924. RPP-6924 also gives the derivation of the equation for $RSD^2(I)$ being the sum of squares of the individual RSDs and gives equations that are similar to confidence intervals for constituent inventories. The sample-based and template-based inventory RSD results are presented in the calculation detail report in the Tank Waste Information Network System (see Appendix A.1).

6.2 RESIDUAL TANK WASTE UNCERTAINTY

6.2.1 Residual Volume Uncertainty

The residual waste volume for 241-A and 241-AX Farm SSTs after retrieval is unknown; as a lower volume, it was assumed that waste will be retrieved to the threshold requirement of 360 ft^3.

[1] Honeywell Enraf® is a registered trademark of Honeywell International Inc., Corporation Delaware, 101 Columbia Road Morristown, New Jersey.

In C Farm only 4 of 9 of the 550,000-gal SSTs retrieved to date were retrieved to less than 360 ft^3. The current BBI tank volume estimate can be used as an upper bound for the 241-A and 241-AX Farm tank volumes.

Table 6-2. Range of Sludge Surface Level Measurements

Tank	Range cm (in.)	Reference
241-C-104	2.82 (1.11)	RPP-RPT-43031, *2009 Auto-TCR for Tank 241-C-104*
241-C-107	0.00	RPP-RPT-43034, *2009 Auto-TCR for Tank 241-C-107*
241-T-105	21.6 (8.50)	WS-97-00119/W, *241-T-105 Riser Prep/Inspect*
241-T-106	5.1 (2.0)	WS-96-00052/W, *241-T-106 Riser Prep/Inspect for LDUA*
241-T-202	43.2 (17.0)	WS-96-00280/W, *241-T-202 Riser Prep/Inspect*
241-T-203	38.1 (15.0)	WS-96-00281/W, *241-T-203 Riser Prep/Inspect*
241-T-204	45.7 (18.0)	WS-96-00282/W, *241-T-204 Riser Prep/Inspect*
241-U-112	19.1 (7.50)	WS-96-00274/W, *241-U-112 Riser Prep for Vapor Sample*
Average range	21.9 (8.64)	
Standard deviation (Range/2)	11.0 (4.32)	

Table 6-3. Range of Saltcake Surface Level Measurements

Tank	Range cm (in.)	Reference
241-BY-102	17 (6.7)	RPP-RPT-42996, *2009 Auto-TCR for Tank 241-BY-102*
241-BY-111	99 (39)	ES-96-00606, *241-BY-111 Riser Preparation and Inspection*
241-S-106	13 (5.2)	RPP-RPT-43049, *2009 Auto-TCR for Tank 241-S-106*
241-TX-107	90 (35.5)	WS-95-00232, *241-TX-107 Riser Prep/Inspect*
241-TX-118	69 (27)	WS-96-00324, *241-TX-118 Riser Prep/Inspect*
241-TY-102	62 (24.5)	WS-97-00055, *241-TY-102 Riser Prep/Inspect*
Average	58 (23)	
Standard Deviation (Range/2)	29 (11.5)	

6.2.2 Residual Concentration Uncertainty

Residual waste concentrations for sample based values for the the 241-A and 241-AX Farm tanks were estimated using the HTWOS model (Section 4.2.2). A general idea of how well HTWOS predicts tank waste residual inventories was shown by comparing the 2002 HTWOS residual concentration estimates for tank 241-C-103 with post-retrieval measurements for the tank (RPP-RPT-42323, *Hanford C-Farm Tank and Ancillary Equipment Residual Waste Inventory Estimates*, Appendix A.2). On average, the HTWOS overestimated the measured

C Farm chemical values for concentrations greater than 10^{-3} g/L by a factor of ~3 and underestimated measured radionuclide concentrations > 10^{-7} Ci/L by a factor of ~0.7. In general, the HTWOS estimates were closer to measured values for constituents with higher concentrations. The HTWOS concentration estimates for total chemicals (kg/L) were a factor of 1.8 times higher than post-retrieval measurements for tank 241-C-106 and 0 to 10 times lower for other C Farm tanks retrieved. The HTWOS concentration estimates for total radionuclides (Ci/L) were 2 to 35 times lower than post-retrieval measurements.

The uncertainty in model based concentration estimates for 241-A and 241-AX Farm tank waste is unknown and may be higher than TS uncertainties.

6.3 ANCILLARY EQUIPMENT RESIDUAL WASTE UNCERTAINTY

6.3.1 Volume Uncertainty

Retrieval of 90% of the remaining waste is assumed for catch tanks and vaults. This is an arbitrary value because no decision has been made to date regarding retrieval of the catch tanks and vaults. As an upper bound estimate for the volume of waste in catch tanks and vaults, no retrieval could be assumed.

It is assumed that most of the waste has been removed from diversion boxes and pits and that remaining waste is adsorbed to the surface of pits and diversion boxes. While this assumption is uncertain, the volume of waste remaining in pits and diversion boxes should be negligible compared to residuals in tanks and pipelines.

The estimated volume of waste in pipelines is also uncertain. An effort was made to provide a conservative estimate. Limited pipeline evaluations conducted in other farms and outside tank farms indicate that the lines should be flushed; none of the 121 lines in 241-A and 241-AX Tank Farms are known to be plugged. However, some of the lines may be plugged or not well flushed. Therefore, as a base case it is assumed that residual waste may be contained in as much as 25% of the pipeline volume. As a worst case, it could be assumed that all of the lines are plugged and full of waste (4 times the base case estimate).

6.3.2 Concentration Uncertainty

Because little composition data is available for waste in ancillary equipment, it was assumed that the average residual waste composition in A Farm tanks is representative of waste in A Farm ancillary equipment and the average residual waste composition in AX Farm tanks is representative of waste in AX Farm ancillary equipment. Pre-retrieval waste compositions may be more representative of waste in plugged lines or of unretrieved/unflushed waste in catch tanks, if any. If waste is not well flushed, the composition of soluble constituents would be greater and the composition of less soluble or insoluble constituents would be lower than for residual waste. As a bounding case, the worst case residual or BBI composition for all of the tanks in 241-A or 241-AX Tank Farms could be used for each BBI constituent. Concentration values by tank and by constituent are provided in Appendix A.2.

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APPENDIX A

HANFORD A AND AX FARM TANK AND ANCILLARY EQUIPMENT RESIDUAL WASTE INVENTORY CALCULATIONS

A.1 DOCUMENTATION A-1

A.2 BEST-BASIS TANK WASTE INVENTORY AND COMPOSITION ESTIMATES A-3

A.3 HTWOS TANK WASTE RESIDUAL INVENTORY AND COMPOSITION ESTIMATES A-39

A.4 ANCILLARY EQUIPMENT RESIDUAL WASTE INVENTORY ESTIMATES A-59

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A.1 DOCUMENTATION

Spreadsheet Documentation

Spreadsheet Name	2014 A&AX Tank Inventory.xlsx
Spreadsheet Location	\\hanford\data\sitedata\projenveng\WMA-A-AX Inv Est\
Spreadsheet Owner	J. G. Field, 376-3753
Related Documents	RPP-RPT-58293, Hanford A and AX Farm Tank and Ancillary Equipment Residual Waste Inventory Estimates
Purpose	This spreadsheet was developed to document A and AX-Farm tank waste inventories and concentrations using BBI and HTWOS estimates as inputs. The spreadsheet results willl be incorporated as Appendix A and B of RPP-RPT-58293.
Overview	The Best Basis Inventory (BBI) for this worksheet was downloaded on 12-2-2014. The HTWOS post-retrieval inventory estimates are from HTWOS model run MMR-50027_Run2 (SVF-4057, _R0_Tank_Residuals_MMR-50027_Run2-7.8-8.3r1-2015-02-10-at-03-33-29.xlsm. The spreadsheet scales the HTWOS inventory estimates from 300 ft3 to 360 ft3 and calculates radionuclides for a decay date of 1/1/2020. Tabs are included to calculate waste concentrations by Tank and average concentrations by farm for BBI constituents.
Worksheet Descriptions	BBI Inv worksheet: This worksheet presents BBI standard chemical and radionuclide inventory estimates (rows 2-79). The 2014 inventory estimates are decayed to 1-1-2020 (rows 82-129) by multiplying the BBI values by decay factors from the "concentration" work sheet.
	BBI Conc Worksheet: This worksheet calculates standard BBI chemical and radionuclide concentrations by dividing the inventory values from the "inventory" worksheet by BBI tank waste volume estimates. The radionuclide concentrations are then decayed to 1-1-2020 values by mutiplying by decay values for corresponding rows in column U. The decay values in column U are calculated based on the 1/2 life of radionuclides and formulas in SVF-2545, Spreadsheet for Data Entry and Decay Calculation (Rows 71-125, Columns W-AA). Start and end decay dates are inputs in cells U73 and U74 respectively. SVF-2545 is based on 1/2 life values taken from the 16th edition of chart of the nuclides. Column S shows average concentrations for all of the C-Farm tanks for each applicable constituent. Column U shows average values for tanks retrieved and sampled as of 4-1-2014.
	HTWOS Download Worksheet: A and AX Farm residual waste inventory estimates downloaded from HTWOS version 7.8, MMR-50027_Run2-7.8-8.3r1-2015-02-10-at-03-33-29.
	HTWOS Resid Inv Worksheet: Calculated residual inventories from HTWOS. Values scaled to 360 ft3 and radionuclide values decayed from 1/1/2034 to 1/1/2020. Chemical values for Al, Cr and Mn calculated from species data in the HTWOS download.

	HTWOS Resid Conc Worksheet: Residual inventory estimates are divided by the waste volume (360 ft3) to calculate constituent concentrations in units of kg/L and Ci/L by tank. Average constituent concentrations by Farm are also calculated. Columns Q and R show concentration estimates in mass units calculated by mutiplying kg/L and Ci/L by a density factor or 2.68 and by unit conversion factors. The density factor of 2.68 is calculated from HTWOS assumptions that solids willl make up 83% by wt of the waste and have a density of 3 g/mL. Liquids make up the other 17% by wt of the waste and have an assumed density of 1.1. The liquid densities before retrieval were about 1.5 g/mL. HTWOS multiplies pre-retrieval liquid concentration estimates by a factor of 5 x 10-4. this would leave a density slightly greater than 1 so values are rounded up to 1.1 for this application.
	Ancillary Inv Worksheet: Residual inventory estimates for ancillary equipment, including catch tanks and vaults, pit, diversion boxes and pipelines. Values based on residual volume estimates described in RPP-ENV-5XXX multiplied by average concentrations of residual waste in A/AX farm tanks from HTWOS resid conc. worksheet.
	BBI Calc Detail Worksheet: Calculation detail and and uncertainty estimates for A-AX Farm standard BBI chemicals and radionuclides.
	TS Unc Worksheet: Relative standard deviations for A1-Saltcake constituents based on sample templates (RPP-8847, *Best-Basis Inventory Template Compositions of Common Tank Waste Layers*).
	Supplemental Worksheet: Analytical data for A and AX farm tanks for supplemental (non-standard) BBI constituents.
	RPP-RPT-58293 Worksheet: This is a title page for this spreadsheet.
Macros and Add-in software	None
Key Assumptions	None
Units	Inventory units are shown (kg or Ci). Concentration units g/L or Ci/L as shown. Waste volumes are shown as kL and ft3. Conversions: 1 gal = 3.785 L, 1 ft3 = 7.481 gal, .
Input Data	BBI inventory values; SVF-2545 spreadsheet, and Start and end dates for decay calcualtions, "concentration" worksheet cells AA73 and AA74.
Verification	By: L. A. Fort
	Date: April 7, 2015
	Summary: Checked and verified worksheet inputs and formulas

A.2 BEST-BASIS TANK WASTE INVENTORY AND COMPOSITION ESTIMATES

Best-Basis Tank Inventory Summary, Downloaded from the Tank Waste Information Network System (TWINS) on 12-2-2014

Analyte	units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A	AX-101	AX-102	AX-103	AX-104	Sum AX	Sum A and AX
Volume	kL	1037	151	1447	102	139	308	3.18E+03	1353	113	403	28	1897	5081
Al	kg	4.50E+04	7.56E+03	4.05E+04	8.06E+03	8.28E+03	1.47E+04	1.24E+05	5.12E+04	2.37E+03	1.51E+04	2.67E+03	7.13E+04	1.95E+05
Bi	kg	3.54E+01	6.24E+01	2.55E+02	8.05E-02	0.00E+00	1.18E+02	4.71E+02	4.49E+01	2.63E+00	1.01E+01	0.00E+00	5.76E+01	5.29E+02
Ca	kg	1.27E+03	1.26E+02	3.90E+03	1.74E+03	2.33E+03	3.40E+03	1.28E+04	1.00E+03	2.44E+02	3.51E+02	6.10E+02	2.21E+03	1.50E+04
Cl	kg	7.17E+03	1.81E+03	1.18E+04	1.29E+02	9.32E+01	4.38E+03	2.54E+04	8.63E+03	1.09E+02	3.22E+03	1.58E+01	1.20E+04	3.74E+04
TIC as CO3	kg	1.74E+05	4.90E+03	1.55E+05	3.02E+03	2.09E+04	1.19E+04	3.70E+05	2.28E+05	1.24E+04	3.29E+04	4.51E+03	2.78E+05	6.48E+05
Cr	kg	6.58E+03	1.59E+03	3.48E+03	1.79E+02	6.37E+02	3.27E+03	1.57E+04	6.14E+03	1.02E+02	2.13E+03	2.91E+01	8.40E+03	2.41E+04
F	kg	9.85E+02	5.22E+01	1.50E+03	2.12E+00	3.01E+01	5.74E+01	2.63E+03	1.62E+03	5.92E+01	5.39E+02	5.09E+00	2.22E+03	4.85E+03
Fe	kg	7.34E+02	3.53E+03	1.38E+03	2.95E+04	1.92E+04	1.70E+04	7.13E+04	1.39E+03	6.40E+03	4.54E+03	1.36E+04	2.59E+04	9.73E+04
Hg	kg	3.40E+00	1.89E-01	3.05E+00	3.66E+01	3.83E+01	2.59E+02	3.41E+02	1.36E+01	7.59E+00	5.24E+00	8.27E+00	3.47E+01	3.75E+02
K	kg	5.54E+03	8.12E+02	6.19E+03	5.72E+01	3.74E+01	1.45E+03	1.41E+04	7.43E+03	6.15E+01	2.02E+03	8.07E+00	9.52E+03	2.36E+04
La	kg	2.02E+01	1.86E+01	1.10E-03	7.73E+00	4.37E+02	5.66E+01	5.40E+02	1.09E-03	6.84E+00	5.51E+01	7.41E+01	1.36E+02	6.76E+02
Mn	kg	2.06E+02	6.09E+02	2.90E+02	4.13E+03	6.49E+02	9.11E+02	6.80E+03	6.72E+01	5.22E+02	6.15E+02	2.36E+02	1.44E+03	8.24E+03
Na	kg	3.86E+05	3.22E+04	4.89E+05	3.23E+04	5.50E+04	7.86E+04	1.07E+06	4.90E+05	2.43E+04	1.07E+05	2.17E+03	6.23E+05	1.70E+06
Ni	kg	3.27E+02	7.58E+01	2.83E+02	1.92E+03	2.78E+03	4.03E+02	5.79E+03	1.97E+02	1.49E+02	2.70E+02	7.35E+02	1.35E+03	7.14E+03
NO2	kg	1.33E+05	2.27E+04	1.99E+05	6.74E+03	6.67E+02	4.57E+04	4.08E+05	1.65E+05	5.07E+03	5.39E+04	1.13E+02	2.24E+05	6.32E+05
NO3	kg	2.44E+05	2.48E+04	2.70E+05	3.02E+02	1.71E+04	5.03E+04	6.07E+05	3.35E+05	2.58E+04	6.83E+04	2.30E+03	4.31E+05	1.04E+06
Pb	kg	3.28E+02	2.58E+02	2.90E+02	5.76E+01	2.76E+03	6.72E+02	4.37E+03	2.01E+02	4.43E+02	3.88E+02	4.67E+02	1.50E+03	5.86E+03
Oxalate	kg	2.55E+04	2.16E+03	2.86E+04	0.00E+00	0.00E+00	6.54E+03	6.28E+04	2.63E+04	3.06E+03	3.62E+03	5.25E+01	3.30E+04	9.58E+04
PO4	kg	9.67E+03	1.31E+03	1.53E+04	5.67E+02	9.51E+03	3.47E+04	7.11E+04	8.86E+03	1.16E+03	3.46E+03	1.26E+02	1.36E+04	8.47E+04
Si	kg	1.62E+03	7.15E+02	2.55E+04	2.47E+03	4.86E+03	2.48E+04	6.00E+04	1.29E+03	1.01E+03	1.17E+03	4.38E+01	3.51E+03	6.35E+04
SO4	kg	4.64E+04	9.59E+02	3.88E+04	1.50E+03	8.82E+03	2.46E+03	9.89E+04	5.95E+04	4.62E+02	8.25E+03	2.39E+02	6.85E+04	1.67E+05
Sr	kg	1.83E+01	5.68E+00	3.20E+00	5.54E+01	6.40E+01	3.35E+01	1.80E+02	4.55E+00	1.16E+02	4.58E+01	4.80E+01	2.14E+02	3.94E+02
TOC	kg	1.26E+04	2.76E+03	1.85E+04	0.00E+00	0.00E+00	4.31E+03	3.82E+04	1.13E+04	6.05E+03	2.54E+03	1.46E+01	1.99E+04	5.81E+04
UTOTAL	kg	1.28E+03	6.36E+03	3.29E+03	1.74E+03	2.57E+00	5.18E+02	1.32E+04	1.66E+03	5.39E+02	1.93E+02	1.65E+02	2.56E+03	1.57E+04
Zr	kg	1.34E+02	8.76E+01	4.58E+02	2.08E+01	1.18E+03	7.76E+02	2.66E+03	6.14E+01	1.89E+01	1.54E+02	1.99E+02	4.33E+02	3.09E+03
SUM	kg	1.10E+06	1.15E+05	1.31E+06	9.45E+04	1.55E+05	3.07E+05	3.09E+06	1.40E+06	9.05E+04	3.11E+05	2.84E+04	1.83E+06	4.92E+06

BBI Radionuclide values; decayed to 1/1/2008 (standard BBI decay date)

Analyte	units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A	AX-101	AX-102	AX-103	AX-104	Sum AX	Sum A and AX
106Ru	Ci	1.62E-06	1.24E-07	1.17E-06	7.31E-07	4.62E-06	6.19E-05	7.02E-05	4.40E-06	6.56E-05	1.92E-06	2.83E-06	7.48E-05	1.45E-04
113mCd	Ci	6.31E+01	7.85E+00	7.20E+01	1.95E+00	4.41E+00	9.72E+00	1.59E+02	7.94E+01	5.31E+00	1.73E+01	9.52E-01	1.03E+02	2.62E+02
125Sb	Ci	1.48E+00	1.55E-01	1.33E+00	1.45E+01	1.08E+01	1.11E+01	3.94E+01	1.90E+00	1.37E+02	8.76E+00	8.73E+00	1.56E+02	1.96E+02
126Sn	Ci	3.79E+00	7.03E-01	5.43E+00	2.04E-01	4.09E-01	5.80E-01	1.11E+01	4.82E+00	1.08E+00	1.26E+00	8.85E-02	7.25E+00	1.84E+01
129I	Ci	2.33E-01	2.18E-02	5.18E-02	7.28E-03	1.70E-03	6.32E-02	3.79E-01	2.95E-01	1.68E-02	6.77E-02	3.66E-04	3.80E-01	7.59E-01
134Cs	Ci	4.56E-02	6.14E-03	5.27E-02	4.88E-02	7.32E-02	2.70E-02	2.53E-01	5.45E-02	3.33E-03	1.99E-02	1.58E-02	9.35E-02	3.47E-01
137Cs	Ci	2.76E+05	3.70E+04	3.08E+05	5.65E+04	9.80E+04	5.86E+04	8.34E+05	3.71E+05	2.24E+04	1.05E+05	4.53E+04	5.44E+05	1.38E+06
137mBa	Ci	2.61E+05	3.50E+04	2.90E+05	5.33E+04	9.25E+04	5.53E+04	7.87E+05	3.50E+05	2.11E+04	9.95E+04	4.27E+04	5.13E+05	1.30E+06
14C	Ci	6.57E+00	2.54E-01	5.88E+00	3.71E-01	4.94E-01	5.18E-01	1.41E+01	8.23E+00	6.64E-02	1.73E+00	1.07E-01	1.01E+01	2.42E+01
151Sm	Ci	1.84E+04	1.47E+03	1.50E+04	4.23E+04	1.38E+05	3.10E+05	5.25E+05	2.90E+04	3.69E+04	2.06E+04	2.99E+04	1.16E+05	6.42E+05
152Eu	Ci	6.48E+00	2.07E-01	2.16E+00	7.32E+00	1.02E+02	5.48E+01	1.73E+02	4.77E+00	1.71E+01	1.33E+01	2.20E+01	5.72E+01	2.30E+02
154Eu	Ci	4.15E+02	1.29E+01	1.33E+02	9.36E+02	2.09E+03	3.42E+03	7.01E+03	2.95E+02	5.61E+02	1.39E+03	6.34E+02	2.88E+03	9.89E+03
155Eu	Ci	1.39E+02	3.71E+00	3.91E+01	1.55E+02	2.71E+02	1.07E+03	1.68E+03	8.90E+01	1.89E+02	3.00E+02	2.47E+02	8.25E+02	2.50E+03
226Ra	Ci	7.28E-05	9.90E-06	8.72E-05	1.94E-06	3.98E-06	1.03E-05	1.86E-04	9.18E-05	5.80E-06	2.05E-05	8.60E-07	1.19E-04	3.05E-04
227Ac	Ci	1.70E-02	2.46E-03	2.10E-02	1.55E-05	2.04E-05	1.67E-03	4.22E-02	2.15E-02	1.27E-03	4.81E-03	4.40E-06	2.76E-02	6.98E-02
228Ra	Ci	1.10E-04	1.59E-05	1.36E-04	1.87E-06	3.39E-11	1.24E-05	2.76E-04	1.39E-04	1.19E-03	1.22E-04	7.33E-12	1.45E-03	1.73E-03
229Th	Ci	3.02E-05	4.39E-06	3.76E-05	7.34E-07	2.41E-08	3.62E-06	7.66E-05	3.83E-05	2.25E-06	8.58E-06	5.22E-09	4.91E-05	1.26E-04
231Pa	Ci	8.26E-02	1.20E-02	1.03E-01	2.65E-05	2.82E-05	8.07E-03	2.06E-01	1.05E-01	6.15E-03	2.34E-02	6.09E-06	1.35E-01	3.40E-01
232Th	Ci	1.10E-04	1.59E-05	1.36E-04	1.87E-06	3.39E-11	1.24E-05	2.76E-04	1.39E-04	1.19E-03	1.22E-04	7.33E-12	1.45E-03	1.73E-03
232U	Ci	4.07E-02	2.09E-01	1.07E-01	3.38E-03	6.39E-08	6.55E-03	3.67E-01	3.73E-02	1.66E-02	1.03E-02	4.11E-06	6.42E-02	4.31E-01
233U	Ci	2.63E+00	1.35E+01	6.88E+00	2.22E-01	1.24E-07	4.22E-01	2.37E+01	2.40E+00	1.07E+00	9.15E-02	7.97E-06	3.56E+00	2.72E+01
234U	Ci	4.75E-01	2.36E+00	1.22E+00	5.83E-01	8.77E-04	1.82E-01	4.82E+00	6.01E-01	2.03E-01	1.04E-01	5.65E-02	9.65E-01	5.79E+00
235U	Ci	1.93E-02	9.57E-02	4.95E-02	2.45E-02	3.67E-05	7.56E-03	1.97E-01	2.47E-02	8.25E-03	2.75E-03	2.36E-03	3.81E-02	2.35E-01
236U	Ci	1.24E-02	6.19E-02	3.20E-02	1.40E-02	2.26E-05	4.68E-03	1.25E-01	1.58E-02	5.67E-03	3.67E-03	1.45E-03	2.66E-02	1.52E-01
237Np	Ci	1.35E+00	1.49E-01	1.45E+00	5.75E-02	7.59E-02	2.26E-01	3.31E+00	1.69E+00	2.71E-01	4.80E-02	1.64E-02	2.03E+00	5.33E+00
238Pu	Ci	3.45E+00	1.24E+01	1.07E+01	2.19E+01	2.53E+01	3.90E+01	1.13E+02	4.63E+00	1.37E+01	4.20E+00	1.23E+01	3.48E+01	1.48E+02
238U	Ci	4.27E-01	2.12E+00	1.10E+00	5.80E-01	8.57E-04	1.73E-01	4.40E+00	5.53E-01	1.80E-01	6.45E-02	5.52E-02	8.53E-01	5.25E+00
239Pu	Ci	7.99E+01	3.12E+02	2.76E+02	6.81E+02	5.56E+02	1.03E+03	2.93E+03	1.16E+02	1.52E+02	9.26E+01	2.69E+02	6.30E+02	3.56E+03
240Pu	Ci	1.92E+01	7.24E+01	6.35E+01	1.49E+02	1.36E+02	2.36E+02	6.76E+02	2.68E+01	4.87E+01	2.34E+01	6.61E+01	1.65E+02	8.41E+02
241Am	Ci	3.77E+02	2.50E+02	3.02E+02	8.07E+02	5.59E+03	5.86E+02	7.91E+03	3.92E+02	2.14E+03	7.24E+02	9.45E+02	4.20E+03	1.21E+04
241Pu	Ci	1.22E+02	4.65E+02	3.93E+02	6.85E+02	8.68E+02	1.37E+03	3.90E+03	1.65E+02	5.95E+02	1.44E+02	4.20E+02	1.32E+03	5.23E+03
242Cm	Ci	3.37E-01	2.07E-01	2.53E-01	5.14E-01	4.89E+00	4.10E-01	6.61E+00	3.24E-01	3.15E+00	6.35E-01	8.23E-01	4.93E+00	1.15E+01
242Pu	Ci	1.41E-03	5.42E-03	4.54E-03	7.43E-03	9.88E-03	1.56E-02	4.43E-02	1.90E-03	7.45E-03	1.64E-03	4.79E-03	1.58E-02	6.01E-02
243Am	Ci	2.12E-01	1.42E-01	1.75E-01	4.03E-01	3.00E+00	3.06E-01	4.24E+00	2.42E-01	1.96E+00	3.90E-01	5.05E-01	3.10E+00	7.34E+00
243Cm	Ci	1.57E-02	7.22E-03	8.92E-03	2.17E-02	2.56E-01	2.00E-02	3.30E-01	1.89E-02	2.83E-01	3.29E-02	4.32E-02	3.78E-01	7.08E-01
244Cm	Ci	3.37E-01	1.60E-01	1.97E-01	4.67E-01	5.43E+00	4.40E-01	7.03E+00	4.16E-01	6.25E+00	6.98E-01	9.13E-01	8.28E+00	1.53E+01
3H	Ci	1.57E+01	1.74E+00	1.69E+01	1.37E+00	1.32E+00	3.86E+00	4.09E+01	1.97E+01	1.48E+00	4.14E+00	2.86E-01	2.56E+01	6.65E+01
59Ni	Ci	1.41E+01	1.52E+00	1.50E+01	9.84E+00	1.29E+01	1.13E+01	6.47E+01	1.70E+01	1.71E+00	5.06E+00	2.79E+00	2.66E+01	9.12E+01
60Co	Ci	2.53E+01	1.08E+01	1.16E+01	7.86E+01	1.80E+02	2.91E+01	3.35E+02	2.64E+01	5.98E+01	4.16E+01	8.74E+01	2.15E+02	5.51E+02
63Ni	Ci	1.28E+03	1.38E+02	1.36E+03	8.90E+02	1.18E+03	1.02E+03	5.87E+03	1.54E+03	1.56E+02	4.61E+02	2.55E+02	2.41E+03	8.28E+03
79Se	Ci	1.48E+00	2.07E-01	1.80E+00	1.01E-01	2.03E-01	2.87E-01	4.08E+00	1.87E+00	3.55E-02	4.37E-01	4.39E-02	2.39E+00	6.46E+00
90Sr	Ci	1.10E+05	7.05E+04	1.28E+05	2.08E+06	2.62E+06	4.45E+05	5.45E+06	2.01E+05	2.09E+05	4.04E+05	1.87E+06	2.68E+06	8.14E+06
90Y	Ci	1.10E+05	7.05E+04	1.28E+05	2.08E+06	2.62E+06	4.45E+05	5.45E+06	2.01E+05	2.09E+05	4.04E+05	1.87E+06	2.68E+06	8.14E+06
93mNb	Ci	3.46E+01	5.00E+00	4.28E+01	2.31E+00	4.55E+00	6.48E+00	9.57E+01	4.35E+01	2.70E+00	1.03E+01	9.83E-01	5.75E+01	1.53E+02
93Zr	Ci	4.05E+01	5.84E+00	5.00E+01	2.68E+00	5.37E+00	7.62E+00	1.12E+02	5.10E+01	3.16E+00	1.21E+01	1.16E+00	6.74E+01	1.79E+02
99Tc	Ci	2.29E+02	3.70E+01	3.13E+02	1.41E+01	2.82E+01	1.48E+02	7.69E+02	2.90E+02	6.30E+00	7.03E+01	2.06E+01	3.87E+02	1.16E+03
SUM	sum	7.78E+05	2.16E+05	8.72E+05	4.32E+06	5.58E+06	1.32E+06	1.31E+07	1.16E+06	5.03E+05	1.04E+06	3.86E+06	6.56E+06	1.96E+07

Radionuclide values decayed to 1/1/2020 for closure data package

Analyte	units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A	AX-101	AX-102	AX-103	AX-104	Sum AX	Sum A and AX	Decay values from Conc. Sheet
106Ru	Ci	4.66E-10	3.56E-11	3.36E-10	2.10E-10	1.33E-09	1.78E-08	2.02E-08	1.26E-09	1.89E-08	5.52E-10	8.13E-10	2.15E-08	4.16E-08	0.000287
113mCd	Ci	3.50E+01	4.35E+00	3.99E+01	1.08E+00	2.44E+00	5.39E+00	8.82E+01	4.40E+01	2.94E+00	9.59E+00	5.28E-01	5.71E+01	1.45E+02	0.554376
125Sb	Ci	7.25E-02	7.60E-03	6.52E-02	7.11E-01	5.29E-01	5.44E-01	1.93E+00	9.31E-02	6.71E+00	4.29E-01	4.28E-01	7.66E+00	9.59E+00	0.049003
126Sn	Ci	3.79E+00	7.03E-01	5.43E+00	2.04E-01	4.09E-01	5.80E-01	1.11E+01	4.82E+00	1.08E+00	1.26E+00	8.85E-02	7.25E+00	1.84E+01	0.999964
129I	Ci	2.33E-01	2.18E-02	5.18E-02	7.28E-03	1.70E-03	6.32E-02	3.79E-01	2.95E-01	1.68E-02	6.77E-02	3.66E-04	3.80E-01	7.59E-01	0.999999
134Cs	Ci	8.12E-04	1.09E-04	9.39E-04	8.69E-04	1.30E-03	4.81E-04	4.51E-03	9.71E-04	5.93E-05	3.54E-04	2.81E-04	1.67E-03	6.18E-03	0.01781
137Cs	Ci	2.09E+05	2.81E+04	2.34E+05	4.28E+04	7.43E+04	4.44E+04	6.33E+05	2.81E+05	1.70E+04	7.96E+04	3.44E+04	4.12E+05	1.04E+06	0.758348
137mBa	Ci	1.87E+05	2.51E+04	2.08E+05	3.82E+04	6.62E+04	3.96E+04	5.63E+05	2.51E+05	1.51E+04	7.12E+04	3.06E+04	3.67E+05	9.31E+05	0.71588
14C	Ci	6.56E+00	2.54E-01	5.87E+00	3.70E-01	4.93E-01	5.17E-01	1.41E+01	8.22E+00	6.63E-02	1.73E+00	1.07E-01	1.01E+01	2.42E+01	0.998546
151Sm	Ci	1.68E+04	1.34E+03	1.37E+04	3.86E+04	1.26E+05	2.83E+05	4.79E+05	2.64E+04	3.36E+04	1.88E+04	2.73E+04	1.06E+05	5.85E+05	0.911722
152Eu	Ci	3.51E+00	1.12E-01	1.17E+00	3.96E+00	5.52E+01	2.96E+01	9.36E+01	2.58E+00	9.25E+00	7.20E+00	1.19E+01	3.09E+01	1.25E+02	0.541014
154Eu	Ci	1.58E+02	4.90E+00	5.05E+01	3.56E+02	7.94E+02	1.30E+03	2.66E+03	1.12E+02	2.13E+02	5.28E+02	2.41E+02	1.09E+03	3.76E+03	0.379853
155Eu	Ci	2.41E+01	6.44E-01	6.79E+00	2.69E+01	4.70E+01	1.86E+02	2.91E+02	1.54E+01	3.28E+01	5.21E+01	4.29E+01	1.43E+02	4.34E+02	0.173581
226Ra	Ci	7.24E-05	9.85E-06	8.67E-05	1.93E-06	3.96E-06	1.02E-05	1.85E-04	9.13E-05	5.77E-06	2.04E-05	8.56E-07	1.18E-04	3.03E-04	0.994812
227Ac	Ci	1.16E-02	1.68E-03	1.43E-02	1.06E-05	1.39E-05	1.14E-03	2.88E-02	1.47E-02	8.67E-04	3.28E-03	3.00E-06	1.88E-02	4.76E-02	0.682468
228Ra	Ci	2.60E-05	3.75E-06	3.21E-05	4.41E-07	8.00E-12	2.93E-06	6.52E-05	3.28E-05	2.81E-04	2.88E-05	1.73E-12	3.42E-04	4.08E-04	0.235969
229Th	Ci	3.02E-05	4.39E-06	3.76E-05	7.33E-07	2.41E-08	3.62E-06	7.65E-05	3.83E-05	2.25E-06	8.57E-06	5.21E-09	4.91E-05	1.26E-04	0.998861
231Pa	Ci	8.26E-02	1.20E-02	1.03E-01	2.65E-05	2.82E-05	8.07E-03	2.06E-01	1.05E-01	6.15E-03	2.34E-02	6.09E-06	1.35E-01	3.40E-01	0.999746
232Th	Ci	1.10E-04	1.59E-05	1.36E-04	1.87E-06	3.39E-11	1.24E-05	2.76E-04	1.39E-04	1.19E-03	1.22E-04	7.33E-12	1.45E-03	1.73E-03	1
232U	Ci	3.61E-02	1.86E-01	9.50E-02	3.00E-03	5.67E-08	5.81E-03	3.25E-01	3.31E-02	1.47E-02	9.14E-03	3.65E-06	5.70E-02	3.82E-01	0.887661
233U	Ci	2.63E+00	1.35E+01	6.88E+00	2.22E-01	1.24E-07	4.22E-01	2.37E+01	2.40E+00	1.07E+00	9.15E-02	7.97E-06	3.56E+00	2.72E+01	0.999948
234U	Ci	4.75E-01	2.36E+00	1.22E+00	5.83E-01	8.77E-04	1.82E-01	4.82E+00	6.01E-01	2.03E-01	1.04E-01	5.65E-02	9.64E-01	5.79E+00	0.999966
235U	Ci	1.93E-02	9.57E-02	4.95E-02	2.45E-02	3.67E-05	7.56E-03	1.97E-01	2.47E-02	8.25E-03	2.75E-03	2.36E-03	3.81E-02	2.35E-01	1
236U	Ci	1.24E-02	6.19E-02	3.20E-02	1.40E-02	2.26E-05	4.68E-03	1.25E-01	1.58E-02	5.67E-03	3.67E-03	1.45E-03	2.66E-02	1.52E-01	1
237Np	Ci	1.35E+00	1.49E-01	1.45E+00	5.75E-02	7.59E-02	2.26E-01	3.31E+00	1.69E+00	2.71E-01	4.80E-02	1.64E-02	2.03E+00	5.33E+00	0.999996
238Pu	Ci	3.14E+00	1.13E+01	9.73E+00	1.99E+01	2.30E+01	3.55E+01	1.03E+02	4.21E+00	1.25E+01	3.82E+00	1.12E+01	3.17E+01	1.34E+02	0.909515
238U	Ci	4.27E-01	2.12E+00	1.10E+00	5.80E-01	8.57E-04	1.73E-01	4.40E+00	5.53E-01	1.80E-01	6.45E-02	5.52E-02	8.53E-01	5.25E+00	1
239Pu	Ci	7.99E+01	3.12E+02	2.76E+02	6.81E+02	5.56E+02	1.03E+03	2.93E+03	1.16E+02	1.52E+02	9.26E+01	2.69E+02	6.29E+02	3.56E+03	0.999655
240Pu	Ci	1.92E+01	7.23E+01	6.34E+01	1.49E+02	1.36E+02	2.36E+02	6.75E+02	2.68E+01	4.86E+01	2.34E+01	6.60E+01	1.65E+02	8.40E+02	0.998733
241Am	Ci	3.70E+02	2.45E+02	2.96E+02	7.92E+02	5.48E+03	5.75E+02	7.76E+03	3.85E+02	2.10E+03	7.10E+02	9.27E+02	4.12E+03	1.19E+04	0.980961
241Pu	Ci	6.85E+01	2.61E+02	2.21E+02	3.84E+02	4.87E+02	7.69E+02	2.19E+03	9.26E+01	3.34E+02	8.08E+01	2.36E+02	7.43E+02	2.93E+03	0.561231
242Cm	Ci	3.18E-01	1.95E-01	2.39E-01	4.85E-01	4.61E+00	3.87E-01	6.23E+00	3.05E-01	2.97E+00	5.99E-01	7.76E-01	4.65E+00	1.09E+01	0.942715
242Pu	Ci	1.41E-03	5.42E-03	4.54E-03	7.43E-03	9.88E-03	1.56E-02	4.43E-02	1.90E-03	7.45E-03	1.64E-03	4.79E-03	1.58E-02	6.01E-02	0.999978
243Am	Ci	2.12E-01	1.42E-01	1.75E-01	4.03E-01	3.00E+00	3.06E-01	4.23E+00	2.42E-01	1.96E+00	3.90E-01	5.04E-01	3.09E+00	7.33E+00	0.998872
243Cm	Ci	1.18E-02	5.43E-03	6.70E-03	1.63E-02	1.92E-01	1.50E-02	2.48E-01	1.42E-02	2.13E-01	2.47E-02	3.25E-02	2.84E-01	5.32E-01	0.751387
244Cm	Ci	2.13E-01	1.01E-01	1.24E-01	2.95E-01	3.43E+00	2.78E-01	4.44E+00	2.63E-01	3.95E+00	4.41E-01	5.77E-01	5.23E+00	9.67E+00	0.631571
3H	Ci	7.99E+00	8.86E-01	8.60E+00	6.97E-01	6.72E-01	1.97E+00	2.08E+01	1.00E+01	7.53E-01	2.11E+00	1.46E-01	1.30E+01	3.39E+01	0.509083
59Ni	Ci	1.41E+01	1.52E+00	1.50E+01	9.84E+00	1.29E+01	1.13E+01	6.47E+01	1.70E+01	1.71E+00	5.06E+00	2.79E+00	2.66E+01	9.12E+01	0.999891
60Co	Ci	5.22E+00	2.23E+00	2.39E+00	1.62E+01	3.71E+01	6.01E+00	6.92E+01	5.45E+00	1.23E+01	8.59E+00	1.80E+01	4.44E+01	1.14E+02	0.206382
63Ni	Ci	1.18E+03	1.27E+02	1.25E+03	8.20E+02	1.09E+03	9.39E+02	5.40E+03	1.42E+03	1.44E+02	4.25E+02	2.35E+02	2.22E+03	7.63E+03	0.920946
79Se	Ci	1.48E+00	2.07E-01	1.80E+00	1.01E-01	2.03E-01	2.87E-01	4.08E+00	1.87E+00	3.55E-02	4.37E-01	4.39E-02	2.39E+00	6.46E+00	0.999971
90Sr	Ci	8.24E+04	5.28E+04	9.59E+04	1.56E+06	1.96E+06	3.33E+05	4.08E+06	1.51E+05	1.57E+05	3.03E+05	1.40E+06	2.01E+06	6.10E+06	0.749003
90Y	Ci	8.24E+04	5.28E+04	9.59E+04	1.56E+06	1.96E+06	3.33E+05	4.08E+06	1.51E+05	1.57E+05	3.03E+05	1.40E+06	2.01E+06	6.10E+06	0.749003
93mNb	Ci	2.06E+01	2.98E+00	2.55E+01	1.38E+00	2.71E+00	3.87E+00	5.71E+01	2.59E+01	1.61E+00	6.14E+00	5.86E-01	3.43E+01	9.14E+01	0.596527
93Zr	Ci	4.05E+01	5.84E+00	5.00E+01	2.68E+00	5.37E+00	7.62E+00	1.12E+02	5.10E+01	3.16E+00	1.21E+01	1.16E+00	6.74E+01	1.79E+02	0.999994
99Tc	Ci	2.29E+02	3.70E+01	3.13E+02	1.41E+01	2.82E+01	1.48E+02	7.69E+02	2.90E+02	6.30E+00	7.03E+01	2.06E+01	3.87E+02	1.16E+03	0.999961
SUM	sum	5.80E+05	1.61E+05	6.49E+05	3.24E+06	4.20E+06	1.04E+06	9.87E+06	8.62E+05	3.82E+05	7.77E+05	2.90E+06	4.92E+06	1.48E+07	

A and AX Farm Tank Waste Concentrations and Average Concentrations by Constituent													
Analyte	**Units**	**A-101**	**A-102**	**A-103**	**A-104**	**A-105**	**A-106**	**Average A**	**AX-101**	**AX-102**	**AX-103**	**AX-104**	**Average AX**
Tank Volume	kL	1.04E+03	1.51E+02	1.45E+03	1.02E+02	1.39E+02	3.08E+02		1.35E+03	1.13E+02	4.03E+02	2.80E+01	
Al	g/L	4.34E+01	5.01E+01	2.80E+01	7.90E+01	5.96E+01	4.77E+01	5.13E+01	3.78E+01	2.10E+01	3.75E+01	9.54E+01	4.79E+01
Bi	g/L	3.41E-02	4.13E-01	1.76E-01	7.89E-04	0.00E+00	3.83E-01	1.68E-01	3.32E-02	2.33E-02	2.51E-02	0.00E+00	2.04E-02
Ca	g/L	1.22E+00	8.34E-01	2.70E+00	1.71E+01	1.68E+01	1.10E+01	8.27E+00	7.39E-01	2.16E+00	8.71E-01	2.18E+01	6.39E+00
Cl	g/L	6.91E+00	1.20E+01	8.15E+00	1.26E+00	6.71E-01	1.42E+01	7.20E+00	6.38E+00	9.65E-01	7.99E+00	5.64E-01	3.97E+00
TIC as CO3	g/L	1.68E+02	3.25E+01	1.07E+02	2.96E+01	1.50E+02	3.86E+01	8.77E+01	1.69E+02	1.10E+02	8.16E+01	1.61E+02	1.30E+02
Cr	g/L	6.35E+00	1.05E+01	2.40E+00	1.75E+00	4.58E+00	1.06E+01	6.04E+00	4.54E+00	9.03E-01	5.29E+00	1.04E+00	2.94E+00
F	g/L	9.50E-01	3.46E-01	1.04E+00	2.08E-02	2.17E-01	1.86E-01	4.59E-01	1.20E+00	5.24E-01	1.34E+00	1.82E-01	8.10E-01
Fe	g/L	7.08E-01	2.34E+01	9.54E-01	2.89E+02	1.38E+02	5.52E+01	8.46E+01	1.03E+00	5.66E+01	1.13E+01	4.86E+02	1.39E+02
Hg	g/L	3.28E-03	1.25E-03	2.11E-03	3.59E-01	2.76E-01	8.41E-01	2.47E-01	1.01E-02	6.72E-02	1.30E-02	2.95E-01	9.64E-02
K	g/L	5.34E+00	5.38E+00	4.28E+00	5.61E-01	2.69E-01	4.71E+00	3.42E+00	5.49E+00	5.44E-01	5.01E+00	2.88E-01	2.83E+00
La	g/L	1.95E-02	1.23E-01	7.60E-07	7.58E-02	3.14E+00	1.84E-01	5.91E-01	8.06E-07	6.05E-02	1.37E-01	2.65E+00	7.11E-01
Mn	g/L	1.99E-01	4.03E+00	2.00E-01	4.05E+01	4.67E+00	2.96E+00	8.76E+00	4.97E-02	4.62E+00	1.53E+00	8.43E+00	3.66E+00
Na	g/L	3.72E+02	2.13E+02	3.38E+02	3.17E+02	3.96E+02	2.55E+02	3.15E+02	3.62E+02	2.15E+02	2.66E+02	7.75E+01	2.30E+02
Ni	g/L	3.15E-01	5.02E-01	1.96E-01	1.88E+01	2.00E+01	1.31E+00	6.86E+00	1.46E-01	1.32E+00	6.70E-01	2.63E+01	7.10E+00
NO2	g/L	1.28E+02	1.50E+02	1.38E+02	6.61E+01	4.80E+00	1.48E+02	1.06E+02	1.22E+02	4.49E+01	1.34E+02	4.04E+00	7.62E+01
NO3	g/L	2.35E+02	1.64E+02	1.87E+02	2.96E+00	1.23E+02	1.63E+02	1.46E+02	2.48E+02	2.28E+02	1.69E+02	8.21E+01	1.82E+02
Pb	g/L	3.16E-01	1.71E+00	2.00E-01	5.65E-01	1.99E+01	2.18E+00	4.14E+00	1.49E-01	3.92E+00	9.63E-01	1.67E+01	5.43E+00
Oxalate	g/L	2.46E+01	1.43E+01	1.98E+01	0.00E+00	0.00E+00	2.12E+01	1.33E+01	1.94E+01	2.71E+01	8.98E+00	1.88E+00	1.43E+01
PO4	g/L	9.32E+00	8.68E+00	1.06E+01	5.56E+00	6.84E+01	1.13E+02	3.59E+01	6.55E+00	1.03E+01	8.59E+00	4.50E+00	7.47E+00
Si	g/L	1.56E+00	4.74E+00	1.76E+01	2.42E+01	3.50E+01	8.05E+01	2.73E+01	9.53E-01	8.94E+00	2.90E+00	1.56E+00	3.59E+00
SO4	g/L	4.47E+01	6.35E+00	2.68E+01	1.47E+01	6.35E+01	7.99E+00	2.73E+01	4.40E+01	4.09E+00	2.05E+01	8.54E+00	1.93E+01
Sr	g/L	1.76E-02	3.76E-02	2.21E-03	5.43E-01	4.60E-01	1.09E-01	1.95E-01	3.36E-03	1.03E+00	1.14E-01	1.71E+00	7.14E-01
TOC	g/L	1.22E+01	1.83E+01	1.28E+01	0.00E+00	0.00E+00	1.40E+01	9.53E+00	8.35E+00	5.35E+01	6.30E+00	5.21E-01	1.72E+01
UTOTAL	g/L	1.23E+00	4.21E+01	2.27E+00	1.71E+01	1.85E-02	1.68E+00	1.07E+01	1.23E+00	4.77E+00	4.79E-01	5.89E+00	3.09E+00
Zr	g/L	1.29E-01	5.80E-01	3.17E-01	2.04E-01	8.49E+00	2.52E+00	2.04E+00	4.54E-02	1.67E-01	3.82E-01	7.11E+00	1.93E+00

A and AX Farm Tank Waste Concentrations and Average Concentrations by Constituent

Radioactivity		**Radionuclides decayed to 1/1/2008 (standard BBI values)**											
106Ru	Ci/L	1.56E-12	8.21E-13	8.09E-13	7.17E-12	3.32E-11	2.01E-10	4.08E-11	3.25E-12	5.81E-10	4.76E-12	1.01E-10	1.72E-10
113mCd	Ci/L	6.08E-05	5.20E-05	4.98E-05	1.91E-05	3.17E-05	3.16E-05	4.08E-05	5.87E-05	4.70E-05	4.29E-05	3.40E-05	4.57E-05
125Sb	Ci/L	1.43E-06	1.03E-06	9.19E-07	1.42E-04	7.77E-05	3.60E-05	4.32E-05	1.40E-06	1.21E-03	2.17E-05	3.12E-04	3.87E-04
126Sn	Ci/L	3.65E-06	4.66E-06	3.75E-06	2.00E-06	2.94E-06	1.88E-06	3.15E-06	3.56E-06	9.56E-06	3.13E-06	3.16E-06	4.85E-06
129I	Ci/L	2.25E-07	1.44E-07	3.58E-08	7.14E-08	1.22E-08	2.05E-07	1.16E-07	2.18E-07	1.49E-07	1.68E-07	1.31E-08	1.37E-07
134Cs	Ci/L	4.40E-08	4.07E-08	3.64E-08	4.78E-07	5.27E-07	8.77E-08	2.02E-07	4.03E-08	2.95E-08	4.94E-08	5.64E-07	1.71E-07
137Cs	Ci/L	2.66E-01	2.45E-01	2.13E-01	5.54E-01	7.05E-01	1.90E-01	3.62E-01	2.74E-01	1.98E-01	2.61E-01	1.62E+00	5.88E-01
137mBa	Ci/L	2.52E-01	2.32E-01	2.00E-01	5.23E-01	6.65E-01	1.80E-01	3.42E-01	2.59E-01	1.87E-01	2.47E-01	1.53E+00	5.54E-01
14C	Ci/L	6.34E-06	1.68E-06	4.06E-06	3.64E-06	3.55E-06	1.68E-06	3.49E-06	6.08E-06	5.88E-07	4.29E-06	3.82E-06	3.70E-06
151Sm	Ci/L	1.77E-02	9.74E-03	1.04E-02	4.15E-01	9.93E-01	1.01E+00	4.09E-01	2.14E-02	3.27E-01	5.11E-02	1.07E+00	3.67E-01
152Eu	Ci/L	6.25E-06	1.37E-06	1.49E-06	7.18E-05	7.34E-04	1.78E-04	1.65E-04	3.53E-06	1.51E-04	3.30E-05	7.86E-04	2.43E-04
154Eu	Ci/L	4.00E-04	8.54E-05	9.19E-05	9.18E-03	1.50E-02	1.11E-02	5.98E-03	2.18E-04	4.96E-03	3.45E-03	2.26E-02	7.82E-03
155Eu	Ci/L	1.34E-04	2.46E-05	2.70E-05	1.52E-03	1.95E-03	3.47E-03	1.19E-03	6.58E-05	1.67E-03	7.44E-04	8.82E-03	2.83E-03
226Ra	Ci/L	7.02E-11	6.56E-11	6.03E-11	1.90E-11	2.86E-11	3.34E-11	4.62E-11	6.78E-11	5.13E-11	5.09E-11	3.07E-11	5.02E-11
227Ac	Ci/L	1.64E-08	1.63E-08	1.45E-08	1.52E-10	1.47E-10	5.42E-09	8.82E-09	1.59E-08	1.12E-08	1.19E-08	1.57E-10	9.81E-09
228Ra	Ci/L	1.06E-10	1.05E-10	9.40E-11	1.83E-11	2.44E-16	4.03E-11	6.07E-11	1.03E-10	1.05E-08	3.03E-10	2.62E-16	2.73E-09
229Th	Ci/L	2.91E-11	2.91E-11	2.60E-11	7.20E-12	1.73E-13	1.18E-11	1.72E-11	2.83E-11	1.99E-11	2.13E-11	1.86E-13	1.74E-11
231Pa	Ci/L	7.97E-08	7.95E-08	7.12E-08	2.60E-10	2.03E-10	2.62E-08	4.28E-08	7.76E-08	5.44E-08	5.81E-08	2.18E-10	4.76E-08
232Th	Ci/L	1.06E-10	1.05E-10	9.40E-11	1.83E-11	2.44E-16	4.03E-11	6.07E-11	1.03E-10	1.05E-08	3.03E-10	2.62E-16	2.73E-09
232U	Ci/L	3.92E-08	1.38E-06	7.39E-08	3.31E-08	4.60E-13	2.13E-08	2.59E-07	2.76E-08	1.47E-07	2.56E-08	1.47E-10	5.00E-08
233U	Ci/L	2.54E-06	8.94E-05	4.75E-06	2.18E-06	8.92E-13	1.37E-06	1.67E-05	1.77E-06	9.47E-06	2.27E-07	2.85E-10	2.87E-06
234U	Ci/L	4.58E-07	1.56E-05	8.43E-07	5.72E-06	6.31E-09	5.91E-07	3.87E-06	4.44E-07	1.80E-06	2.58E-07	2.02E-06	1.13E-06
235U	Ci/L	1.86E-08	6.34E-07	3.42E-08	2.40E-07	2.64E-10	2.45E-08	1.59E-07	1.83E-08	7.30E-08	6.82E-09	8.43E-08	4.56E-08
236U	Ci/L	1.20E-08	4.10E-07	2.21E-08	1.37E-07	1.63E-10	1.52E-08	9.94E-08	1.17E-08	5.02E-08	9.11E-09	5.18E-08	3.07E-08
237Np	Ci/L	1.30E-06	9.87E-07	1.00E-06	5.64E-07	5.46E-07	7.34E-07	8.56E-07	1.25E-06	2.40E-06	1.19E-07	5.86E-07	1.09E-06
238Pu	Ci/L	3.33E-06	8.21E-05	7.39E-06	2.15E-04	1.82E-04	1.27E-04	1.03E-04	3.42E-06	1.21E-04	1.04E-05	4.39E-04	1.44E-04
238U	Ci/L	4.12E-07	1.40E-05	7.60E-07	5.69E-06	6.17E-09	5.62E-07	3.58E-06	4.09E-07	1.59E-06	1.60E-07	1.97E-06	1.03E-06
239Pu	Ci/L	7.70E-05	2.07E-03	1.91E-04	6.68E-03	4.00E-03	3.34E-03	2.73E-03	8.57E-05	1.35E-03	2.30E-04	9.61E-03	2.82E-03
240Pu	Ci/L	1.85E-05	4.79E-04	4.39E-05	1.46E-03	9.78E-04	7.66E-04	6.25E-04	1.98E-05	4.31E-04	5.81E-05	2.36E-03	7.17E-04

A and AX Farm Tank Waste Concentrations and Average Concentrations by Constituent

Radioactivity		**Radionuclides decayed to 1/1/2008 (standard BBI values)**											
241Am	Ci/L	3.64E-04	1.66E-03	2.09E-04	7.91E-03	4.02E-02	1.90E-03	8.71E-03	2.90E-04	1.89E-02	1.80E-03	3.38E-02	1.37E-02
241Pu	Ci/L	1.18E-04	3.08E-03	2.72E-04	6.72E-03	6.24E-03	4.45E-03	3.48E-03	1.22E-04	5.27E-03	3.57E-04	1.50E-02	5.19E-03
242Cm	Ci/L	3.25E-07	1.37E-06	1.75E-07	5.04E-06	3.52E-05	1.33E-06	7.24E-06	2.39E-07	2.79E-05	1.58E-06	2.94E-05	1.48E-05
242Pu	Ci/L	1.36E-09	3.59E-08	3.14E-09	7.28E-08	7.11E-08	5.06E-08	3.92E-08	1.40E-09	6.59E-08	4.07E-09	1.71E-07	6.06E-08
243Am	Ci/L	2.04E-07	9.40E-07	1.21E-07	3.95E-06	2.16E-05	9.94E-07	4.63E-06	1.79E-07	1.73E-05	9.68E-07	1.80E-05	9.13E-06
243Cm	Ci/L	1.51E-08	4.78E-08	6.16E-09	2.13E-07	1.84E-06	6.49E-08	3.65E-07	1.40E-08	2.50E-06	8.16E-08	1.54E-06	1.04E-06
244Cm	Ci/L	3.25E-07	1.06E-06	1.36E-07	4.58E-06	3.91E-05	1.43E-06	7.77E-06	3.07E-07	5.53E-05	1.73E-06	3.26E-05	2.25E-05
3H	Ci/L	1.51E-05	1.15E-05	1.17E-05	1.34E-05	9.50E-06	1.25E-05	1.23E-05	1.46E-05	1.31E-05	1.03E-05	1.02E-05	1.20E-05
59Ni	Ci/L	1.36E-05	1.01E-05	1.04E-05	9.65E-05	9.28E-05	3.67E-05	4.33E-05	1.26E-05	1.51E-05	1.26E-05	9.96E-05	3.50E-05
60Co	Ci/L	2.44E-05	7.15E-05	8.02E-06	7.71E-04	1.29E-03	9.45E-05	3.77E-04	1.95E-05	5.29E-04	1.03E-04	3.12E-03	9.43E-04
63Ni	Ci/L	1.23E-03	9.14E-04	9.40E-04	8.73E-03	8.49E-03	3.31E-03	3.94E-03	1.14E-03	1.38E-03	1.14E-03	9.11E-03	3.19E-03
79Se	Ci/L	1.43E-06	1.37E-06	1.24E-06	9.90E-07	1.46E-06	9.32E-07	1.24E-06	1.38E-06	3.14E-07	1.08E-06	1.57E-06	1.09E-06
90Sr	Ci/L	1.06E-01	4.67E-01	8.85E-02	2.04E+01	1.88E+01	1.44E+00	6.89E+00	1.49E-01	1.85E+00	1.00E+00	6.68E+01	1.74E+01
90Y	Ci/L	1.06E-01	4.67E-01	8.85E-02	2.04E+01	1.88E+01	1.44E+00	6.89E+00	1.49E-01	1.85E+00	1.00E+00	6.68E+01	1.74E+01
93mNb	Ci/L	3.34E-05	3.31E-05	2.96E-05	2.26E-05	3.27E-05	2.10E-05	2.87E-05	3.22E-05	2.39E-05	2.56E-05	3.51E-05	2.92E-05
93Zr	Ci/L	3.91E-05	3.87E-05	3.46E-05	2.63E-05	3.86E-05	2.47E-05	3.37E-05	3.77E-05	2.80E-05	3.00E-05	4.14E-05	3.43E-05
99Tc	Ci/L	2.21E-04	2.45E-04	2.16E-04	1.38E-04	2.03E-04	4.81E-04	2.51E-04	2.14E-04	5.58E-05	1.74E-04	7.36E-04	2.95E-04

A and AX Farm Tank Waste Concentrations and Average Concentrations by Constituent

Radioactivity		**Radionuclides decayed to 1/1/2020 (decay date for C-Farm Closure data package)**											
106Ru	Ci/L	4.49E-16	2.36E-16	2.32E-16	2.06E-15	9.55E-15	5.78E-14	1.17E-14	9.35E-16	1.67E-13	1.37E-15	2.90E-14	4.95E-14
113mCd	Ci/L	3.37E-05	2.88E-05	2.76E-05	1.06E-05	1.76E-05	1.75E-05	2.26E-05	3.25E-05	2.61E-05	2.38E-05	1.88E-05	2.53E-05
125Sb	Ci/L	6.99E-08	5.03E-08	4.50E-08	6.97E-06	3.81E-06	1.77E-06	2.12E-06	6.88E-08	5.94E-05	1.07E-06	1.53E-05	1.90E-05
126Sn	Ci/L	3.65E-06	4.66E-06	3.75E-06	2.00E-06	2.94E-06	1.88E-06	3.15E-06	3.56E-06	9.56E-06	3.13E-06	3.16E-06	4.85E-06
129I	Ci/L	2.25E-07	1.44E-07	3.58E-08	7.14E-08	1.22E-08	2.05E-07	1.16E-07	2.18E-07	1.49E-07	1.68E-07	1.31E-08	1.37E-07
134Cs	Ci/L	7.83E-10	7.24E-10	6.49E-10	8.52E-09	9.38E-09	1.56E-09	3.60E-09	7.17E-10	5.25E-10	8.79E-10	1.01E-08	3.04E-09
137Cs	Ci/L	2.02E-01	1.86E-01	1.61E-01	4.20E-01	5.35E-01	1.44E-01	2.75E-01	2.08E-01	1.50E-01	1.98E-01	1.23E+00	4.46E-01
137mBa	Ci/L	1.80E-01	1.66E-01	1.43E-01	3.74E-01	4.76E-01	1.29E-01	2.45E-01	1.85E-01	1.34E-01	1.77E-01	1.09E+00	3.97E-01
14C	Ci/L	6.33E-06	1.68E-06	4.06E-06	3.63E-06	3.55E-06	1.68E-06	3.49E-06	6.07E-06	5.87E-07	4.29E-06	3.82E-06	3.69E-06
151Sm	Ci/L	1.62E-02	8.88E-03	9.45E-03	3.78E-01	9.05E-01	9.18E-01	3.73E-01	1.95E-02	2.98E-01	4.66E-02	9.74E-01	3.34E-01
152Eu	Ci/L	3.38E-06	7.42E-07	8.08E-07	3.88E-05	3.97E-04	9.63E-05	8.95E-05	1.91E-06	8.19E-05	1.79E-05	4.25E-04	1.32E-04
154Eu	Ci/L	1.52E-04	3.25E-05	3.49E-05	3.49E-03	5.71E-03	4.22E-03	2.27E-03	8.28E-05	1.89E-03	1.31E-03	8.60E-03	2.97E-03
155Eu	Ci/L	2.33E-05	4.26E-06	4.69E-06	2.64E-04	3.38E-04	6.03E-04	2.06E-04	1.14E-05	2.90E-04	1.29E-04	1.53E-03	4.91E-04
226Ra	Ci/L	6.98E-11	6.52E-11	5.99E-11	1.89E-11	2.85E-11	3.33E-11	4.59E-11	6.75E-11	5.11E-11	5.06E-11	3.06E-11	4.99E-11
227Ac	Ci/L	1.12E-08	1.11E-08	9.90E-09	1.04E-10	1.00E-10	3.70E-09	6.02E-09	1.08E-08	7.67E-09	8.15E-09	1.07E-10	6.69E-09
228Ra	Ci/L	2.50E-11	2.48E-11	2.22E-11	4.33E-12	5.75E-17	9.50E-12	1.43E-11	2.42E-11	2.48E-09	7.14E-11	6.18E-17	6.45E-10
229Th	Ci/L	2.91E-11	2.90E-11	2.60E-11	7.19E-12	1.73E-13	1.17E-11	1.72E-11	2.83E-11	1.99E-11	2.13E-11	1.86E-13	1.74E-11
231Pa	Ci/L	7.96E-08	7.95E-08	7.12E-08	2.60E-10	2.03E-10	2.62E-08	4.28E-08	7.76E-08	5.44E-08	5.80E-08	2.17E-10	4.76E-08
232Th	Ci/L	1.06E-10	1.05E-10	9.40E-11	1.83E-11	2.44E-16	4.03E-11	6.07E-11	1.03E-10	1.05E-08	3.03E-10	2.62E-16	2.73E-09
232U	Ci/L	3.48E-08	1.23E-06	6.56E-08	2.94E-08	4.08E-13	1.89E-08	2.30E-07	2.45E-08	1.30E-07	2.27E-08	1.30E-10	4.44E-08
233U	Ci/L	2.54E-06	8.94E-05	4.75E-06	2.18E-06	8.92E-13	1.37E-06	1.67E-05	1.77E-06	9.47E-06	2.27E-07	2.85E-10	2.87E-06
234U	Ci/L	4.58E-07	1.56E-05	8.43E-07	5.72E-06	6.31E-09	5.91E-07	3.87E-06	4.44E-07	1.80E-06	2.58E-07	2.02E-06	1.13E-06
235U	Ci/L	1.86E-08	6.34E-07	3.42E-08	2.40E-07	2.64E-10	2.45E-08	1.59E-07	1.83E-08	7.30E-08	6.82E-09	8.43E-08	4.56E-08
236U	Ci/L	1.20E-08	4.10E-07	2.21E-08	1.37E-07	1.63E-10	1.52E-08	9.94E-08	1.17E-08	5.02E-08	9.11E-09	5.18E-08	3.07E-08
237Np	Ci/L	1.30E-06	9.87E-07	1.00E-06	5.64E-07	5.46E-07	7.34E-07	8.56E-07	1.25E-06	2.40E-06	1.19E-07	5.86E-07	1.09E-06
238Pu	Ci/L	3.03E-06	7.47E-05	6.73E-06	1.95E-04	1.66E-04	1.15E-04	9.34E-05	3.11E-06	1.10E-04	9.48E-06	4.00E-04	1.31E-04
238U	Ci/L	4.12E-07	1.40E-05	7.60E-07	5.69E-06	6.17E-09	5.62E-07	3.58E-06	4.09E-07	1.59E-06	1.60E-07	1.97E-06	1.03E-06
239Pu	Ci/L	7.70E-05	2.07E-03	1.91E-04	6.67E-03	4.00E-03	3.34E-03	2.72E-03	8.57E-05	1.34E-03	2.30E-04	9.60E-03	2.82E-03
240Pu	Ci/L	1.85E-05	4.79E-04	4.38E-05	1.46E-03	9.77E-04	7.65E-04	6.24E-04	1.98E-05	4.30E-04	5.80E-05	2.36E-03	7.16E-04

A and AX Farm Tank Waste Concentrations and Average Concentrations by Constituent

Radioactivity		**Radionuclides decayed to 1/1/2020 (decay date for C-Farm Closure data package)**											
241Am	Ci/L	3.57E-04	1.62E-03	2.05E-04	7.76E-03	3.95E-02	1.87E-03	8.54E-03	2.84E-04	1.86E-02	1.76E-03	3.31E-02	1.34E-02
241Pu	Ci/L	6.60E-05	1.73E-03	1.52E-04	3.77E-03	3.50E-03	2.50E-03	1.95E-03	6.84E-05	2.96E-03	2.01E-04	8.42E-03	2.91E-03
242Cm	Ci/L	3.06E-07	1.29E-06	1.65E-07	4.75E-06	3.32E-05	1.25E-06	6.82E-06	2.26E-07	2.63E-05	1.49E-06	2.77E-05	1.39E-05
242Pu	Ci/L	1.36E-09	3.59E-08	3.14E-09	7.28E-08	7.11E-08	5.06E-08	3.92E-08	1.40E-09	6.59E-08	4.07E-09	1.71E-07	6.06E-08
243Am	Ci/L	2.04E-07	9.39E-07	1.21E-07	3.95E-06	2.16E-05	9.92E-07	4.63E-06	1.79E-07	1.73E-05	9.67E-07	1.80E-05	9.12E-06
243Cm	Ci/L	1.14E-08	3.59E-08	4.63E-09	1.60E-07	1.38E-06	4.88E-08	2.74E-07	1.05E-08	1.88E-06	6.13E-08	1.16E-06	7.78E-07
244Cm	Ci/L	2.05E-07	6.69E-07	8.60E-08	2.89E-06	2.47E-05	9.02E-07	4.90E-06	1.94E-07	3.49E-05	1.09E-06	2.06E-05	1.42E-05
3H	Ci/L	7.71E-06	5.87E-06	5.95E-06	6.84E-06	4.83E-06	6.38E-06	6.26E-06	7.41E-06	6.67E-06	5.23E-06	5.20E-06	6.13E-06
59Ni	Ci/L	1.36E-05	1.01E-05	1.04E-05	9.65E-05	9.28E-05	3.67E-05	4.33E-05	1.26E-05	1.51E-05	1.26E-05	9.96E-05	3.50E-05
60Co	Ci/L	5.04E-06	1.48E-05	1.65E-06	1.59E-04	2.67E-04	1.95E-05	7.79E-05	4.03E-06	1.09E-04	2.13E-05	6.44E-04	1.95E-04
63Ni	Ci/L	1.14E-03	8.42E-04	8.66E-04	8.04E-03	7.82E-03	3.05E-03	3.62E-03	1.05E-03	1.27E-03	1.05E-03	8.39E-03	2.94E-03
79Se	Ci/L	1.43E-06	1.37E-06	1.24E-06	9.90E-07	1.46E-06	9.32E-07	1.24E-06	1.38E-06	3.14E-07	1.08E-06	1.57E-06	1.09E-06
90Sr	Ci/L	7.95E-02	3.50E-01	6.63E-02	1.53E+01	1.41E+01	1.08E+00	5.16E+00	1.11E-01	1.39E+00	7.51E-01	5.00E+01	1.31E+01
90Y	Ci/L	7.95E-02	3.50E-01	6.63E-02	1.53E+01	1.41E+01	1.08E+00	5.16E+00	1.11E-01	1.39E+00	7.51E-01	5.00E+01	1.31E+01
93mNb	Ci/L	1.99E-05	1.98E-05	1.76E-05	1.35E-05	1.95E-05	1.26E-05	1.71E-05	1.92E-05	1.43E-05	1.52E-05	2.09E-05	1.74E-05
93Zr	Ci/L	3.91E-05	3.87E-05	3.46E-05	2.63E-05	3.86E-05	2.47E-05	3.37E-05	3.77E-05	2.80E-05	3.00E-05	4.14E-05	3.43E-05
99Tc	Ci/L	2.21E-04	2.45E-04	2.16E-04	1.38E-04	2.03E-04	4.81E-04	2.51E-04	2.14E-04	5.58E-05	1.74E-04	7.36E-04	2.95E-04

SPREADSHEET FOR DATA ENTRY AND DECAY CALCULATION (SVF-2545)

Decay from	1/1/2008
Decay to	1/1/2020
Days of Decay	4383

Radionuclide	Alt Radionuclide Name	Half Life (years)	Lambda (1/day)	Decay Factor
Ru-106	106Ru	1.020	1.861E-03	0.0003
Cd-113m	113mCd	14.1	1.346E-04	0.5544
Sb-125	125Sb	2.758	6.881E-04	0.0490
Sn-126	126Sn	2.3E+05	8.251E-09	1.0000
I-129	129I	1.57E+07	1.209E-10	1.0000
Cs-134	134Cs	2.065	9.190E-04	0.0178
Cs-137	137Cs	30.07	6.311E-05	0.7583
Ba-137m	137mBa	4.852E-06	3.911E+02	0.7159
C-14	14C	5715	3.321E-07	0.9985
Sm-151	151Sm	90	2.109E-05	0.9117
Eu-152	152Eu	13.54	1.402E-04	0.5410
Eu-154	154Eu	8.593	2.208E-04	0.3799
Eu-155	155Eu	4.75	3.995E-04	0.1736
Ra-226	226Ra	1599	1.187E-06	0.9948
Ac-227 (2nd Order)	227Ac	21.772	8.716E-05	0.6825
Ra-228 (2nd Order)	228Ra	5.76	3.295E-04	0.2360
Th-229	229Th	7.3E+03	2.600E-07	0.9989
Pa-231	231Pa	3.28E+04	5.786E-08	0.9997
Th-232	232Th	1.40E+10	1.356E-13	1.0000
U-232	232U	69.8	2.719E-05	0.8877
U-233	233U	1.592E+05	1.192E-08	0.9999
U-234	234U	2.46E+05	7.714E-09	1.0000
U-235	235U	7.04E+08	2.696E-12	1.0000
U-236	236U	2.342E+07	8.103E-11	1.0000

Radionuclide	Alt Radionuclide Name	Half Life (years)	Lambda (1/day)	Decay Factor
Np-237	237Np	2.14E+06	8.868E-10	1.0000
Pu-238	238Pu	87.7	2.164E-05	0.9095
U-238	238U	4.47E+09	4.245E-13	1.0000
Pu-239	239Pu	2.410E+04	7.874E-08	0.9997
Pu-240	240Pu	6.56E+03	2.893E-07	0.9987
Am-241 (2nd Order)	241Am	432.7	4.386E-06	0.9810
Pu-241	241Pu	14.4	1.318E-04	0.5612
Cm-242	242Cm	4.46E-01		0.9427
Pu-242	242Pu	3.75E+05	5.061E-09	1.0000
Am-243	243Am	7.37E+03	2.575E-07	0.9989
Cm-243	243Cm	29.1	6.521E-05	0.7514
Cm-244	244Cm	18.1	1.048E-04	0.6316
H-3	3H	12.32	1.540E-04	0.5091
Ni-59	59Ni	7.6E+04	2.497E-08	0.9999
Co-60	60Co	5.271	3.600E-04	0.2064
Ni-63	63Ni	101	1.879E-05	0.9209
Se-79	79Se	2.9E+05	6.544E-09	1.0000
Sr-90	90Sr	28.78	6.594E-05	0.7490
Y-90	90Y	7.31E-03	2.596E-01	0.7490
Nb-93m (2nd Order)	93mNb	16.1	1.179E-04	0.5965
Zr-93	93Zr	1.5E+06	1.265E-09	1.0000
Tc-99	99Tc	2.13E+05	8.910E-09	1.0000

All half-lives taken from the Sixteenth Edition of the Chart of the Nuclides.

Relative Standard Deviations for Solid Sample-Based A-1 Saltcake Compositions (RPP-8847)

Waste Type	
	A1-Saltcake
Al	0.74
Bi	NR
Ca	0.54
Cl	0.73
TIC as CO_3	0.41
Cr	0.93
F	1.21
Fe	1.11
Hg	NR
K	1.39
La	NR
Mn	1.97
Na	0.11
Ni	0.92
NO_2	0.83
NO_3	0.42
Free OH	NR
Pb	0.5
PO_4	0.54
Si	1.27
SO_4	0.84
Sr	NR
TOC	0.86
U_{TOTAL}	1.47
Zr	1.11
^{3}H	NR
^{14}C	NR
^{59}Ni	NR
^{60}Co	1

Relative Standard Deviations for Solid Sample-Based A-1 Saltcake Compositions (RPP-8847)

Waste Type	
	A1-Saltcake
^{63}Ni	NR
^{90}Sr	1.16
^{99}Tc	NR
^{134}Cs	NR
^{137}Cs	1
^{154}Eu	NR
^{232}Th	NR
^{238}Pu	NR
^{241}Am	NR
Density	0.05
wt% Water	0.44

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-A-101	Ag	A1-SltCk (Liquid)		2.87E+00	kg	0.100156615	S	1.49	g/mL	0.059	148	kL	0.096377315	1.94E+01	ug/mL	0.027253638
241-A-101	B	A1-SltCk (Liquid)		1.28E+01	kg	0.101984585	S	1.49	g/mL	0.059	148	kL	0.096377315	8.67E+01	ug/mL	0.033350695
241-A-101	Ba	A1-SltCk (Liquid)	<	6.20E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	4.19E+01	ug/mL	1
241-A-101	Be	A1-SltCk (Liquid)	<	6.19E-01	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	4.18E+00	ug/mL	1
241-A-101	Cd	A1-SltCk (Liquid)	<	6.19E-01	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	4.18E+00	ug/mL	1
241-A-101	Co	A1-SltCk (Liquid)	<	2.83E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	1.91E+01	ug/mL	1
241-A-101	Cu	A1-SltCk (Liquid)	<	1.27E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	8.58E+00	ug/mL	1
241-A-101	Li	A1-SltCk (Liquid)	<	3.43E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	2.32E+01	ug/mL	1
241-A-101	Mo	A1-SltCk (Liquid)		2.03E+01	kg	0.098421685	S	1.49	g/mL	0.059	148	kL	0.096377315	1.37E+02	ug/mL	0.019955982
241-A-101	Free OH	A1-SltCk (Liquid)		6.32E+03	kg		E	1.49	g/mL	0.059	148	kL	0.096377315	4.27E+04	ug/mL	
241-A-101	Aroclors (Total PCB)	A1-SltCk (Liquid)	<	3.18E-03	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	2.15E-02	ug/mL	1
241-A-101	Sb	A1-SltCk (Liquid)	<	7.44E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	5.02E+01	ug/mL	1
241-A-101	Th	A1-SltCk (Liquid)		1.43E-01	kg		TE	1.45	g/mL	0.059	148	kL	0.096377315	9.65E-01	ug/mL	
241-A-101	Ti	A1-SltCk (Liquid)	<	1.24E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	8.36E+00	ug/mL	1
241-A-101	V	A1-SltCk (Liquid)	<	6.20E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	4.19E+01	ug/mL	1
241-A-101	Zn	A1-SltCk (Liquid)	<	1.55E+00	kg	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	1.05E+01	ug/mL	1
241-A-101	TotalAlpha	A1-SltCk (Liquid)	<	2.43E+00	Ci	1.004633558	S	1.49	g/mL	0.059	148	kL	0.096377315	1.64E-02	uCi/mL	1
241-A-101	Ag	A1-SltCk (Solid)	<	3.02E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	1.98E+01	ug/g	
241-A-101	B	A1-SltCk (Solid)		1.52E+02	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	9.94E+01	ug/g	
241-A-101	Ba	A1-SltCk (Solid)	<	8.34E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	5.46E+01	ug/g	
241-A-101	Be	A1-SltCk (Solid)	<	8.34E+00	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	5.46E+00	ug/g	
241-A-101	Cd	A1-SltCk (Solid)		2.65E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	1.73E+01	ug/g	
241-A-101	Co	A1-SltCk (Solid)		6.12E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	4.00E+01	ug/g	
241-A-101	Cu	A1-SltCk (Solid)		2.27E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	1.48E+01	ug/g	
241-A-101	Li	A1-SltCk (Solid)	<	6.70E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	4.39E+01	ug/g	
241-A-101	Mo	A1-SltCk (Solid)		9.19E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	6.01E+01	ug/g	
241-A-101	Free OH	A1-SltCk (Solid)		3.21E+04	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	2.10E+04	ug/g	
241-A-101	Aroclors (Total PCB)	A1-SltCk (Solid)	<	2.51E-02	kg	1.007466544	S	1.74	g/mL	0.0755	878	kL	0.096377315	1.65E-02	ug/g	1
241-A-101	Sb	A1-SltCk (Solid)	<	1.00E+02	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	6.55E+01	ug/g	
241-A-101	Th	A1-SltCk (Solid)		8.52E-01	kg		TE	1.58	g/mL	0.0755	878	kL	0.096377315	5.58E-01	ug/g	
241-A-101	Ti	A1-SltCk (Solid)	<	1.67E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	1.09E+01	ug/g	
241-A-101	V	A1-SltCk (Solid)	<	8.34E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	5.46E+01	ug/g	
241-A-101	Zn	A1-SltCk (Solid)		4.13E+01	kg		E	1.74	g/mL	0.0755	878	kL	0.096377315	2.70E+01	ug/g	
241-A-101	TotalAlpha	A1-SltCk (Solid)		1.63E+02	Ci		E	1.74	g/mL	0.0755	878	kL	0.096377315	1.07E-01	uCi/g	
241-A-101	Free OH	P2 (Solid)		1.07E+01	kg		C		g/mL	0.0755	11	kL	8.989375	6.04E+02	ug/g	
241-A-101	Aroclors (Total PCB)	P2 (Solid)		4.43E-01	kg		E	1.61	g/mL	0.0755	11	kL	8.989375	2.50E+01	ug/g	
241-A-101	Th	P2 (Solid)		1.42E-08	kg		TE	1.61	g/mL	0.0755	11	kL	8.989375	8.03E-07	ug/g	
241-A-101	Ag	Total		3.31E+01	kg		S/E									
241-A-101	B	Total		1.65E+02	kg		S/E									
241-A-101	Ba	Total		8.96E+01	kg		S/E									
241-A-101	Be	Total		8.96E+00	kg		S/E									
241-A-101	Cd	Total		2.71E+01	kg		S/E									
241-A-101	Co	Total		6.40E+01	kg		S/E									
241-A-101	Cu	Total		2.40E+01	kg		S/E									

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-A-101	Li	Total		7.04E+01	kg		S/E									
241-A-101	Mo	Total		1.12E+02	kg		S/E									
241-A-101	Free OH	Total		3.84E+04	kg		E/C									
241-A-101	Aroclors (Total PCB)	Total		4.71E-01	kg		S/E									
241-A-101	Sb	Total		1.08E+02	kg		S/E									
241-A-101	Th	Total		9.95E-01	kg		TE									
241-A-101	Ti	Total		1.79E+01	kg		S/E									
241-A-101	V	Total		8.96E+01	kg		S/E									
241-A-101	Zn	Total		4.28E+01	kg		S/E									
241-A-101	TotalAlpha	Total		1.66E+02	Ci		S/E									
241-A-102	B	A1-SltCk (Liquid)		1.03E+00	kg		E	1.57	g/mL	0.059	33	kL	0.486740108	3.13E+01	ug/mL	
241-A-102	Mo	A1-SltCk (Liquid)		3.16E+00	kg		E	1.57	g/mL	0.059	33	kL	0.486740108	9.59E+01	ug/mL	
241-A-102	Free OH	A1-SltCk (Liquid)		5.71E+02	kg		E	1.57	g/mL	0.059	33	kL	0.486740108	1.73E+04	ug/mL	
241-A-102	Aroclors (Total PCB)	A1-SltCk (Liquid)		6.60E-03	kg		E	1.57	g/mL	0.059	33	kL	0.486740108	2.00E-01	ug/mL	
241-A-102	Th	A1-SltCk (Liquid)		3.40E-02	kg		TE	1.45	g/mL	0.059	33	kL	0.486740108	1.03E+00	ug/mL	
241-A-102	239/240Pu	A1-SltCk (Liquid)		1.49E-01	Ci		E	1.57	g/mL	0.059	33	kL	0.486740108	4.53E-03	uCi/mL	
241-A-102	B	A1-SltCk (Solid)		2.72E+00	kg		E	1.59	g/mL	0.0755	106	kL	0.486740108	1.51E+01	ug/g	
241-A-102	Mo	A1-SltCk (Solid)		6.15E+00	kg	0.493414407	S	1.7	g/mL	0.0755	106	kL	0.486740108	3.41E+01	ug/g	0.029010239
241-A-102	Free OH	A1-SltCk (Solid)		1.47E+03	kg		E	1.7	g/mL	0.0755	106	kL	0.486740108	8.18E+03	ug/g	
241-A-102	Aroclors (Total PCB)	A1-SltCk (Solid)		4.50E+00	kg		E	1.7	g/mL	0.0755	106	kL	0.486740108	2.50E+01	ug/g	
241-A-102	Th	A1-SltCk (Solid)		9.32E-02	kg		TE	1.58	g/mL	0.0755	106	kL	0.486740108	5.17E-01	ug/g	
241-A-102	239/240Pu	A1-SltCk (Solid)		3.85E+02	Ci		E	1.59	g/mL	0.0755	106	kL	0.486740108	2.14E+00	uCi/g	
241-A-102	B	A1-SltCk (Liquid)		3.76E-01	kg		E	1.57	g/mL	0.059	12	kL	5.638072917	3.13E+01	ug/mL	
241-A-102	Mo	A1-SltCk (Liquid)		1.15E+00	kg		E	1.57	g/mL	0.059	12	kL	5.638072917	9.59E+01	ug/mL	
241-A-102	Free OH	A1-SltCk (Liquid)		2.08E+02	kg		E	1.57	g/mL	0.059	12	kL	5.638072917	1.73E+04	ug/mL	
241-A-102	Aroclors (Total PCB)	A1-SltCk (Liquid)		2.40E-03	kg		E	1.57	g/mL	0.059	12	kL	5.638072917	2.00E-01	ug/mL	
241-A-102	Th	A1-SltCk (Liquid)		1.75E-02	kg		TE	1.45	g/mL	0.059	12	kL	5.638072917	1.46E+00	ug/mL	
241-A-102	239/240Pu	A1-SltCk (Liquid)		5.44E-02	Ci		E	1.57	g/mL	0.059	12	kL	5.638072917	4.53E-03	uCi/mL	
241-A-102	B	Total		4.13E+00	kg		E									
241-A-102	Mo	Total		1.05E+01	kg		S/E									
241-A-102	Free OH	Total		2.25E+03	kg		E									
241-A-102	Aroclors (Total PCB)	Total		4.51E+00	kg		E									
241-A-102	Th	Total		1.45E-01	kg		TE									
241-A-102	239/240Pu	Total		3.85E+02	Ci		E									
241-A-103	Ag	A1-SltCk (Liquid)	<	6.79E+00	kg		E	1.51	g/mL	0.059	338	kL	0.070179649	2.01E+01	ug/mL	
241-A-103	B	A1-SltCk (Liquid)		1.02E+01	kg		E	1.51	g/mL	0.059	338	kL	0.070179649	3.01E+01	ug/mL	
241-A-103	Cd	A1-SltCk (Liquid)	<	1.70E+01	kg		E	1.51	g/mL	0.059	338	kL	0.070179649	5.02E+01	ug/mL	
241-A-103	Mg	A1-SltCk (Liquid)		8.52E-01	kg		E	1.51	g/mL	0.059	338	kL	0.070179649	2.52E+00	ug/mL	
241-A-103	Free OH	A1-SltCk (Liquid)		1.65E+04	kg	0.344670401	TS	1.45	g/mL	0.059	338	kL	0.070179649	4.89E+04	ug/mL	0.33745
241-A-103	Aroclors (Total PCB)	A1-SltCk (Liquid)	<	4.06E-03	kg	1.002459567	TS	1.51	g/mL	0.059	338	kL	0.070179649	1.20E-02	ug/mL	1
241-A-103	Th	A1-SltCk (Liquid)		3.09E-01	kg		TE	1.45	g/mL	0.059	338	kL	0.070179649	9.15E-01	ug/mL	
241-A-103	Zn	A1-SltCk (Liquid)		1.61E+01	kg		E	1.51	g/mL	0.059	338	kL	0.070179649	4.75E+01	ug/mL	
241-A-103	239/240Pu	A1-SltCk (Liquid)		9.08E+00	Ci		E	1.51	g/mL	0.059	338	kL	0.070179649	2.69E-02	uCi/mL	
241-A-103	Ag	A1-SltCk (Solid)	<	5.49E+01	kg		E	1.32	g/mL	0.0755	1071	kL	0.070179649	2.94E+01	ug/g	

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-A-103	B	A1-SltCk (Solid)		4.21E+01	kg		E	1.32	g/mL	0.0755	1071	kL	0.070179649	2.26E+01	ug/g	
241-A-103	Cd	A1-SltCk (Solid)	<	4.14E+01	kg		E	1.32	g/mL	0.0755	1071	kL	0.070179649	2.22E+01	ug/g	
241-A-103	Mg	A1-SltCk (Solid)		1.79E+03	kg		E	1.32	g/mL	0.0755	1071	kL	0.070179649	9.62E+02	ug/g	
241-A-103	Free OH	A1-SltCk (Solid)		4.99E+04	kg		C		g/mL	0.0755	1071	kL	0.070179649	2.68E+04	ug/g	
241-A-103	Aroclors (Total PCB)	A1-SltCk (Solid)	<	3.16E-01	kg	1.005298679	TS	1.74	g/mL	0.0755	1071	kL	0.070179649	1.69E-01	ug/g	1
241-A-103	Th	A1-SltCk (Solid)		9.13E-01	kg		TE	1.58	g/mL	0.0755	1071	kL	0.070179649	4.90E-01	ug/g	
241-A-103	Zn	A1-SltCk (Solid)		1.09E+02	kg		E	1.32	g/mL	0.0755	1071	kL	0.070179649	5.85E+01	ug/g	
241-A-103	239/240Pu	A1-SltCk (Solid)		2.86E+02	Ci		E	1.32	g/mL	0.0755	1071	kL	0.070179649	1.53E-01	uCi/g	
241-A-103	Free OH	AR (Solid)		7.57E+01	kg		C		g/mL	0.0755	8	kL	12.36039063	7.06E+03	ug/g	
241-A-103	Aroclors (Total PCB)	AR (Solid)	<	1.10E-02	kg	12.40100628	TS	1.34	g/mL	0.0755	8	kL	12.36039063	1.02E+00	ug/g	1
241-A-103	Th	AR (Solid)		5.93E-04	kg		TE	1.34	g/mL	0.0755	8	kL	12.36039063	5.53E-02	ug/g	
241-A-103	239/240Pu	AR (Solid)		4.43E+01	Ci		E	1.34	g/mL	0.0755	8	kL	12.36039063	4.14E+00	uCi/g	
241-A-103	Ag	A1-SltCk (Liquid)	<	3.11E-01	kg		E	1.51	g/mL	0.059	30	kL	2.255229167	1.04E+01	ug/mL	
241-A-103	B	A1-SltCk (Liquid)		4.65E-01	kg		E	1.51	g/mL	0.059	30	kL	2.255229167	1.55E+01	ug/mL	
241-A-103	Cd	A1-SltCk (Liquid)	<	7.76E-01	kg		E	1.51	g/mL	0.059	30	kL	2.255229167	2.59E+01	ug/mL	
241-A-103	Mg	A1-SltCk (Liquid)		3.89E-02	kg		E	1.51	g/mL	0.059	30	kL	2.255229167	1.30E+00	ug/mL	
241-A-103	Free OH	A1-SltCk (Liquid)		7.52E+02	kg	2.280335742	TS	1.45	g/mL	0.059	30	kL	2.255229167	2.51E+04	ug/mL	0.33745
241-A-103	Aroclors (Total PCB)	A1-SltCk (Liquid)	<	3.60E-04	kg	2.466993837	TS	1.26	g/mL	0.059	30	kL	2.255229167	1.20E-02	ug/mL	1
241-A-103	Th	A1-SltCk (Liquid)		1.41E-02	kg		TE	1.45	g/mL	0.059	30	kL	2.255229167	4.69E-01	ug/mL	
241-A-103	Zn	A1-SltCk (Liquid)		7.34E-01	kg		E	1.51	g/mL	0.059	30	kL	2.255229167	2.45E+01	ug/mL	
241-A-103	239/240Pu	A1-SltCk (Liquid)		4.15E-01	Ci		E	1.51	g/mL	0.059	30	kL	2.255229167	1.38E-02	uCi/mL	
241-A-103	Ag	Total		6.20E+01	kg		E									
241-A-103	B	Total		5.28E+01	kg		E									
241-A-103	Cd	Total		5.92E+01	kg		E									
241-A-103	Mg	Total		1.79E+03	kg		E									
241-A-103	Free OH	Total		6.73E+04	kg		C/TS									
241-A-103	Aroclors (Total PCB)	Total		3.31E-01	kg		TS									
241-A-103	Th	Total		1.24E+00	kg		TE									
241-A-103	Zn	Total		1.26E+02	kg		E									
241-A-103	239/240Pu	Total		3.40E+02	Ci		E									
241-A-104	Ba	AR (Solid)		1.26E+02	kg		E	0.95	g/mL	0.0755	102	kL	0.42420566	1.31E+03	ug/g	
241-A-104	Mg	AR (Solid)		2.73E+02	kg		E	0.95	g/mL	0.0755	102	kL	0.42420566	2.83E+03	ug/g	
241-A-104	Free OH	AR (Solid)		1.42E+04	kg		C		g/mL	0.0755	102	kL	0.42420566	1.47E+05	ug/g	
241-A-104	Aroclors (Total PCB)	AR (Solid)		4.18E+00	kg		E	0.95	g/mL	0.0755	102	kL	0.42420566	4.33E+01	ug/g	
241-A-104	Th	AR (Solid)		1.70E-02	kg		TE	1.34	g/mL	0.0755	102	kL	0.42420566	1.76E-01	ug/g	
241-A-104	239/240Pu	AR (Solid)		7.99E+02	Ci		E	0.95	g/mL	0.0755	102	kL	0.42420566	8.28E+00	uCi/g	
241-A-104	Ba	P1 (Solid)		4.94E+00	kg		E	0.95	g/mL	0.0755	4	kL	0.42420566	1.31E+03	ug/g	
241-A-104	Mg	P1 (Solid)		1.07E+01	kg		E	0.95	g/mL	0.0755	4	kL	0.42420566	2.83E+03	ug/g	
241-A-104	Free OH	P1 (Solid)		2.49E+01	kg		C		g/mL	0.0755	4	kL	0.42420566	6.58E+03	ug/g	
241-A-104	Aroclors (Total PCB)	P1 (Solid)		1.64E-01	kg		E	0.95	g/mL	0.0755	4	kL	0.42420566	4.33E+01	ug/g	
241-A-104	Th	P1 (Solid)		5.45E-09	kg		TE	1.61	g/mL	0.0755	4	kL	0.42420566	1.44E-06	ug/g	
241-A-104	239/240Pu	P1 (Solid)		3.13E+01	Ci		E	0.95	g/mL	0.0755	4	kL	0.42420566	8.28E+00	uCi/g	
241-A-104	Ba	Total		1.31E+02	kg		E									
241-A-104	Mg	Total		2.83E+02	kg		E									

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-A-104	Free OH	Total		1.42E+04	kg		C									
241-A-104	Aroclors (Total PCB)	Total		4.34E+00	kg		E									
241-A-104	Th	Total		1.70E-02	kg		TE									
241-A-104	239/240Pu	Total		8.31E+02	Ci		E									
241-A-105	Free OH	P2 (Solid)		0.00E+00	kg		E	1.54	g/mL	0.0755	139	kL	0.323494964	0.00E+00	ug/g	
241-A-105	Aroclors (Total PCB)	P2 (Solid)		5.35E+00	kg		E	1.54	g/mL	0.0755	139	kL	0.323494964	2.50E+01	ug/g	
241-A-105	Th	P2 (Solid)		3.08E-07	kg		TE	1.61	g/mL	0.0755	139	kL	0.323494964	1.44E-06	ug/g	
241-A-105	239/240Pu	P2 (Solid)		6.94E+02	Ci		E	1.54	g/mL	0.0755	139	kL	0.323494964	3.24E+00	uCi/g	
241-A-105	Free OH	Total		0.00E+00	kg		E									
241-A-105	Aroclors (Total PCB)	Total		5.35E+00	kg		E									
241-A-105	Th	Total		3.08E-07	kg		TE									
241-A-105	239/240Pu	Total		6.94E+02	Ci		E									
241-A-106	Ag	A1-SltCk (Solid)		6.58E+01	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	3.52E+02	ug/g	
241-A-106	B	A1-SltCk (Solid)		4.46E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	2.38E+01	ug/g	
241-A-106	Ba	A1-SltCk (Solid)		3.91E+02	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	2.09E+03	ug/g	
241-A-106	Cd	A1-SltCk (Solid)	<	9.13E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	4.88E+01	ug/g	
241-A-106	Co	A1-SltCk (Solid)	<	3.20E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	1.71E+01	ug/g	
241-A-106	Cu	A1-SltCk (Solid)		1.99E+01	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	1.06E+02	ug/g	
241-A-106	Mg	A1-SltCk (Solid)		6.74E+02	kg		E	1.55	g/mL	0.0755	110	kL	0.8989375	3.60E+03	ug/g	
241-A-106	Free OH	A1-SltCk (Solid)		5.63E+00	kg		C		g/mL	0.0755	110	kL	0.8989375	3.01E+01	ug/g	
241-A-106	Aroclors (Total PCB)	A1-SltCk (Solid)		4.67E+00	kg		E	1.7	g/mL	0.0755	110	kL	0.8989375	2.50E+01	ug/g	
241-A-106	Th	A1-SltCk (Solid)		9.67E-02	kg		TE	1.58	g/mL	0.0755	110	kL	0.8989375	5.17E-01	ug/g	
241-A-106	239/240Pu	A1-SltCk (Solid)		4.67E+02	Ci		E	1.55	g/mL	0.0755	110	kL	0.8989375	2.50E+00	uCi/g	
241-A-106	Ag	AR (Solid)		4.73E+01	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	3.52E+02	ug/g	
241-A-106	B	AR (Solid)		3.20E+00	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	2.38E+01	ug/g	
241-A-106	Ba	AR (Solid)		2.81E+02	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	2.09E+03	ug/g	
241-A-106	Cd	AR (Solid)	<	6.56E+00	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	4.88E+01	ug/g	
241-A-106	Co	AR (Solid)	<	2.30E+00	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	1.71E+01	ug/g	
241-A-106	Cu	AR (Solid)		1.43E+01	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	1.06E+02	ug/g	
241-A-106	Mg	AR (Solid)		4.84E+02	kg		E	1.55	g/mL	0.0755	79	kL	0.523191138	3.60E+03	ug/g	
241-A-106	Free OH	AR (Solid)		4.04E+00	kg		C		g/mL	0.0755	79	kL	0.523191138	3.01E+01	ug/g	
241-A-106	Aroclors (Total PCB)	AR (Solid)		3.36E+00	kg		E	1.7	g/mL	0.0755	79	kL	0.523191138	2.50E+01	ug/g	
241-A-106	Th	AR (Solid)		1.55E-02	kg		TE	1.34	g/mL	0.0755	79	kL	0.523191138	1.16E-01	ug/g	
241-A-106	239/240Pu	AR (Solid)		3.36E+02	Ci		E	1.55	g/mL	0.0755	79	kL	0.523191138	2.50E+00	uCi/g	
241-A-106	Ag	SRR (Solid)		6.58E+01	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	3.52E+02	ug/g	
241-A-106	B	SRR (Solid)		4.46E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	2.38E+01	ug/g	
241-A-106	Ba	SRR (Solid)		3.91E+02	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	2.09E+03	ug/g	
241-A-106	Cd	SRR (Solid)	<	9.13E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	4.88E+01	ug/g	
241-A-106	Co	SRR (Solid)	<	3.20E+00	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	1.71E+01	ug/g	
241-A-106	Cu	SRR (Solid)		1.99E+01	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	1.06E+02	ug/g	
241-A-106	Mg	SRR (Solid)		6.74E+02	kg		E	1.55	g/mL	0.0755	110	kL	0.523191138	3.60E+03	ug/g	
241-A-106	Free OH	SRR (Solid)		5.63E+00	kg		C		g/mL	0.0755	110	kL	0.523191138	3.01E+01	ug/g	
241-A-106	Aroclors (Total PCB)	SRR (Solid)		4.67E+00	kg		E	1.7	g/mL	0.0755	110	kL	0.523191138	2.50E+01	ug/g	
241-A-106	Th	SRR (Solid)		1.47E-07	kg		TE	1.51	g/mL	0.0755	110	kL	0.523191138	7.83E-07	ug/g	

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-A-106	239/240Pu	SRR (Solid)		4.67E+02	Ci		E	1.55	g/mL	0.0755	110	kL	0.523191138	2.50E+00	uCi/g	
241-A-106	Ag	Total		1.79E+02	kg		E									
241-A-106	B	Total		1.21E+01	kg		E									
241-A-106	Ba	Total		1.06E+03	kg		E									
241-A-106	Cd	Total		2.48E+01	kg		E									
241-A-106	Co	Total		8.70E+00	kg		E									
241-A-106	Cu	Total		5.40E+01	kg		E									
241-A-106	Mg	Total		1.83E+03	kg		E									
241-A-106	Free OH	Total		1.53E+01	kg		C									
241-A-106	Aroclors (Total PCB)	Total		1.27E+01	kg		E									
241-A-106	Th	Total		1.12E-01	kg		TE									
241-A-106	239/240Pu	Total		1.27E+03	Ci		E									
241-AX-101	Ag	A1-SltCk (Liquid)		3.60E+00	kg	0.080771879	S	1.53	g/mL	0.059	178	kL	0.073683402	2.02E+01	ug/mL	0.033088559
241-AX-101	As	A1-SltCk (Liquid)	<	1.07E+01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+01	ug/mL	1
241-AX-101	B	A1-SltCk (Liquid)		1.68E+01	kg	0.098289043	S	1.53	g/mL	0.059	178	kL	0.073683402	9.46E+01	ug/mL	0.065049922
241-AX-101	Ba	A1-SltCk (Liquid)	<	5.36E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	3.01E+01	ug/mL	1
241-AX-101	Be	A1-SltCk (Liquid)	<	5.34E-01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	3.00E+00	ug/mL	1
241-AX-101	Cd	A1-SltCk (Liquid)	<	5.34E-01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	3.00E+00	ug/mL	1
241-AX-101	Ce	A1-SltCk (Liquid)	<	1.07E+01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+01	ug/mL	1
241-AX-101	Co	A1-SltCk (Liquid)	<	2.14E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	1.20E+01	ug/mL	1
241-AX-101	Cu	A1-SltCk (Liquid)	<	1.07E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+00	ug/mL	1
241-AX-101	Li	A1-SltCk (Liquid)		5.86E+00	kg	0.279040798	S	1.53	g/mL	0.059	178	kL	0.073683402	3.29E+01	ug/mL	0.269136626
241-AX-101	Mg	A1-SltCk (Liquid)	<	1.07E+01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+01	ug/mL	1
241-AX-101	Mo	A1-SltCk (Liquid)		2.31E+01	kg	0.081048707	S	1.53	g/mL	0.059	178	kL	0.073683402	1.30E+02	ug/mL	0.033758692
241-AX-101	Nd	A1-SltCk (Liquid)	<	1.07E+01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+01	ug/mL	1
241-AX-101	Free OH	A1-SltCk (Liquid)		6.94E+03	kg	0.088258452	S	1.4	g/mL	0.059	178	kL	0.073683402	3.90E+04	ug/mL	0.048583029
241-AX-101	Aroclors (Total PCB)	A1-SltCk (Liquid)		3.56E-02	kg		E	1.53	g/mL	0.059	178	kL	0.073683402	2.00E-01	ug/mL	
241-AX-101	Sb	A1-SltCk (Liquid)	<	6.43E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	3.61E+01	ug/mL	1
241-AX-101	Se	A1-SltCk (Liquid)	<	1.07E+01	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+01	ug/mL	1
241-AX-101	Th	A1-SltCk (Liquid)		1.89E-01	kg		TE	1.45	g/mL	0.059	178	kL	0.073683402	1.06E+00	ug/mL	
241-AX-101	Ti	A1-SltCk (Liquid)	<	1.07E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	6.01E+00	ug/mL	1
241-AX-101	V	A1-SltCk (Liquid)	<	5.36E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	3.01E+01	ug/mL	1
241-AX-101	Zn	A1-SltCk (Liquid)	<	1.43E+00	kg	1.002710947	S	1.4	g/mL	0.059	178	kL	0.073683402	8.01E+00	ug/mL	1
241-AX-101	Ag	A1-SltCk (Solid)		4.15E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	2.06E+01	ug/g	
241-AX-101	As	A1-SltCk (Solid)	<	1.22E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.08E+01	ug/g	
241-AX-101	B	A1-SltCk (Solid)		2.19E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	1.09E+02	ug/g	
241-AX-101	Ba	A1-SltCk (Solid)	<	6.12E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	3.04E+01	ug/g	
241-AX-101	Be	A1-SltCk (Solid)	<	6.12E+00	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	3.04E+00	ug/g	
241-AX-101	Cd	A1-SltCk (Solid)		2.45E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	1.22E+01	ug/g	
241-AX-101	Ce	A1-SltCk (Solid)	<	1.22E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.08E+01	ug/g	
241-AX-101	Co	A1-SltCk (Solid)	<	2.45E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	1.22E+01	ug/g	
241-AX-101	Cu	A1-SltCk (Solid)	<	1.26E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.26E+00	ug/g	
241-AX-101	Li	A1-SltCk (Solid)		4.36E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	2.16E+01	ug/g	
241-AX-101	Mg	A1-SltCk (Solid)	<	1.25E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.19E+01	ug/g	

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-AX-101	Mo	A1-SltCk (Solid)		1.07E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	5.32E+01	ug/g	
241-AX-101	Nd	A1-SltCk (Solid)	<	1.22E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.08E+01	ug/g	
241-AX-101	Free OH	A1-SltCk (Solid)		3.87E+04	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	1.92E+04	ug/g	
241-AX-101	Aroclors (Total PCB)	A1-SltCk (Solid)	<	3.39E-02	kg	1.005549349	S	1.73	g/mL	0.0755	1164	kL	0.073683402	1.69E-02	ug/g	1
241-AX-101	Sb	A1-SltCk (Solid)	<	7.34E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	3.65E+01	ug/g	
241-AX-101	Se	A1-SltCk (Solid)	<	1.22E+02	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.08E+01	ug/g	
241-AX-101	Th	A1-SltCk (Solid)		1.07E+00	kg		TE	1.58	g/mL	0.0755	1164	kL	0.073683402	5.32E-01	ug/g	
241-AX-101	Ti	A1-SltCk (Solid)	<	1.22E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	6.08E+00	ug/g	
241-AX-101	V	A1-SltCk (Solid)	<	6.12E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	3.04E+01	ug/g	
241-AX-101	Zn	A1-SltCk (Solid)		8.74E+01	kg		E	1.73	g/mL	0.0755	1164	kL	0.073683402	4.34E+01	ug/g	
241-AX-101	TotalAlpha	A1-SltCk (Solid)		1.60E+02	Ci		E	1.73	g/mL	0.0755	1164	kL	0.073683402	7.93E-02	uCi/g	
241-AX-101	Free OH	SRR (Solid)		7.37E+01	kg		C		g/mL	0.0755	11	kL	8.989375	4.44E+03	ug/g	
241-AX-101	Aroclors (Total PCB)	SRR (Solid)	<	1.65E-04	kg	9.045140305	S	1.51	g/mL	0.0755	11	kL	8.989375	9.91E-03	ug/g	1
241-AX-101	Th	SRR (Solid)		7.47E-09	kg		TE	1.51	g/mL	0.0755	11	kL	8.989375	4.50E-07	ug/g	
241-AX-101	Ag	Total		4.51E+01	kg		S/E									
241-AX-101	As	Total		1.33E+02	kg		S/E									
241-AX-101	B	Total		2.36E+02	kg		S/E									
241-AX-101	Ba	Total		6.65E+01	kg		S/E									
241-AX-101	Be	Total		6.66E+00	kg		S/E									
241-AX-101	Cd	Total		2.51E+01	kg		S/E									
241-AX-101	Ce	Total		1.33E+02	kg		S/E									
241-AX-101	Co	Total		2.66E+01	kg		S/E									
241-AX-101	Cu	Total		1.37E+01	kg		S/E									
241-AX-101	Li	Total		4.94E+01	kg		S/E									
241-AX-101	Mg	Total		1.35E+02	kg		S/E									
241-AX-101	Mo	Total		1.30E+02	kg		S/E									
241-AX-101	Nd	Total		1.33E+02	kg		S/E									
241-AX-101	Free OH	Total		4.57E+04	kg		S/E/C									
241-AX-101	Aroclors (Total PCB)	Total		6.97E-02	kg		S/E									
241-AX-101	Sb	Total		7.99E+01	kg		S/E									
241-AX-101	Se	Total		1.33E+02	kg		S/E									
241-AX-101	Th	Total		1.26E+00	kg		TE									
241-AX-101	Ti	Total		1.33E+01	kg		S/E									
241-AX-101	V	Total		6.65E+01	kg		S/E									
241-AX-101	Zn	Total		8.88E+01	kg		S/E									
241-AX-101	TotalAlpha	Total		1.60E+02	Ci		E									
241-AX-102	Ba	A1-SltCk (Solid)		1.32E+01	kg	1.102104042	S	1.82	g/mL	0.0755	90	kL	1.098701389	9.32E+01	ug/g	0.042288615
241-AX-102	Mg	A1-SltCk (Solid)		3.85E+01	kg	1.101756575	S	1.82	g/mL	0.0755	90	kL	1.098701389	2.71E+02	ug/g	0.031977487
241-AX-102	Free OH	A1-SltCk (Solid)		2.99E+01	kg		C		g/mL	0.0755	90	kL	1.098701389	2.11E+02	ug/g	
241-AX-102	Aroclors (Total PCB)	A1-SltCk (Solid)		1.77E-02	kg	1.487563441	S	1.82	g/mL	0.0755	90	kL	1.098701389	1.25E-01	ug/g	1
241-AX-102	Th	A1-SltCk (Solid)		1.08E+01	kg	1.109161329	S	1.82	g/mL	0.0755	90	kL	1.098701389	7.61E+01	ug/g	0.131885791
241-AX-102	239/240Pu	A1-SltCk (Solid)		4.73E+01	Ci	1.102964514	S	1.82	g/mL	0.0755	90	kL	1.098701389	3.32E-01	uCi/g	0.060710195
241-AX-102	Ba	B (Solid)		3.47E+01	kg		E	1.57	g/mL	0.0755	23	kL	4.299266304	9.62E+02	ug/g	
241-AX-102	Mg	B (Solid)		2.46E+01	kg		E	1.57	g/mL	0.0755	23	kL	4.299266304	6.81E+02	ug/g	

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-AX-102	Free OH	B (Solid)		9.56E-01	kg		C		g/mL	0.0755	23	kL	4.299266304	2.65E+01	ug/g	
241-AX-102	Aroclors (Total PCB)	B (Solid)		9.03E-01	kg		E	1.57	g/mL	0.0755	23	kL	4.299266304	2.50E+01	ug/g	
241-AX-102	Th	B (Solid)		2.19E-08	kg		TE	1.74	g/mL	0.0755	23	kL	4.299266304	6.06E-07	ug/g	
241-AX-102	239/240Pu	B (Solid)		1.54E+02	Ci		E	1.57	g/mL	0.0755	23	kL	4.299266304	4.25E+00	uCi/g	
241-AX-102	Ba	Total		4.80E+01	kg		S/E									
241-AX-102	Mg	Total		6.31E+01	kg		S/E									
241-AX-102	Free OH	Total		3.09E+01	kg		C									
241-AX-102	Aroclors (Total PCB)	Total		9.20E-01	kg		S/E									
241-AX-102	Th	Total		1.08E+01	kg		S/TE									
241-AX-102	239/240Pu	Total		2.01E+02	Ci		S/E									
241-AX-103	Free OH	A1-SltCk (Liquid)		3.61E+03	kg	0.429128984	TS	1.45	g/mL	0.059	75	kL	0.265102212	4.81E+04	ug/mL	0.33745
241-AX-103	Aroclors (Total PCB)	A1-SltCk (Liquid)		1.50E-02	kg		E	1.45	g/mL	0.059	75	kL	0.265102212	2.00E-01	ug/mL	
241-AX-103	Th	A1-SltCk (Liquid)		6.75E-02	kg		TE	1.45	g/mL	0.059	75	kL	0.265102212	9.00E-01	ug/mL	
241-AX-103	Free OH	A1-SltCk (Solid)		1.17E+04	kg		C		g/mL	0.0755	298	kL	0.265102212	2.44E+04	ug/g	
241-AX-103	Aroclors (Total PCB)	A1-SltCk (Solid)		5.59E-03	kg	0.497896483	S	1.61	g/mL	0.0755	298	kL	0.265102212	1.16E-02	ug/g	0.414634146
241-AX-103	Th	A1-SltCk (Solid)		1.04E+00	kg	0.283743055	S	1.61	g/mL	0.0755	298	kL	0.265102212	2.17E+00	ug/g	0.067310389
241-AX-103	Free OH	P2 (Solid)		2.20E+01	kg		C		g/mL	0.0755	30	kL	3.296104167	4.55E+02	ug/g	
241-AX-103	Aroclors (Total PCB)	P2 (Solid)		9.08E-04	kg	3.322939121	S	1.61	g/mL	0.0755	30	kL	3.296104167	1.88E-02	ug/g	0.414634146
241-AX-103	Th	P2 (Solid)		3.88E-08	kg		TE	1.61	g/mL	0.0755	30	kL	3.296104167	8.03E-07	ug/g	
241-AX-103	239/240Pu	P2 (Solid)		1.11E+02	Ci		E	1.61	g/mL	0.0755	30	kL	3.296104167	2.30E+00	uCi/g	
241-AX-103	Free OH	Total		1.53E+04	kg		C/TS									
241-AX-103	Aroclors (Total PCB)	Total		2.15E-02	kg		S/E									
241-AX-103	Th	Total		1.11E+00	kg		S/TE									
241-AX-103	239/240Pu	Total		1.11E+02	Ci		E									
241-AX-104	Ag	P2 (Solid)		2.08E+01	kg	1.609070184	S	1.8	g/mL	0.0755	28	kL	1.605921429	4.13E+02	ug/g	0.066505441
241-AX-104	B	P2 (Solid)		7.43E+00	kg	1.610298354	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.48E+02	ug/g	0.091525424
241-AX-104	Ba	P2 (Solid)		9.31E+01	kg	1.607823336	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.85E+03	ug/g	0.0202977
241-AX-104	Be	P2 (Solid)	<	6.02E-01	kg	1.893326143	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.20E+01	ug/g	1
241-AX-104	Cd	P2 (Solid)		8.20E+01	kg	1.609913559	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.63E+03	ug/g	0.084485407
241-AX-104	Ce	P2 (Solid)		1.42E+02	kg	1.607715042	S	1.8	g/mL	0.0755	28	kL	1.605921429	2.82E+03	ug/g	0.007985803
241-AX-104	Co	P2 (Solid)		7.55E+00	kg	1.608326973	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.50E+02	ug/g	0.045075125
241-AX-104	Cu	P2 (Solid)		5.30E+01	kg	1.607711001	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.05E+03	ug/g	0.007125891
241-AX-104	Li	P2 (Solid)		1.83E+00	kg	1.614581868	S	1.8	g/mL	0.0755	28	kL	1.605921429	3.63E+01	ug/g	0.148965517
241-AX-104	Mg	P2 (Solid)		7.72E+01	kg	1.608132975	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.53E+03	ug/g	0.037520392
241-AX-104	Nd	P2 (Solid)		2.24E+02	kg	1.607714448	S	1.8	g/mL	0.0755	28	kL	1.605921429	4.45E+03	ug/g	0.007865169
241-AX-104	Free OH	P2 (Solid)		3.70E-01	kg		C		g/mL	0.0755	28	kL	1.605921429	7.35E+00	ug/g	
241-AX-104	Aroclors (Total PCB)	P2 (Solid)		1.26E+00	kg		E	1.8	g/mL	0.0755	28	kL	1.605921429	2.50E+01	ug/g	
241-AX-104	Th	P2 (Solid)		6.66E-08	kg		TE	1.61	g/mL	0.0755	28	kL	1.605921429	1.32E-06	ug/g	
241-AX-104	Ti	P2 (Solid)		1.67E+01	kg	1.608105159	S	1.8	g/mL	0.0755	28	kL	1.605921429	3.31E+02	ug/g	0.036308623
241-AX-104	Zn	P2 (Solid)		5.92E+01	kg	1.608258269	S	1.8	g/mL	0.0755	28	kL	1.605921429	1.18E+03	ug/g	0.042553191
241-AX-104	239/240Pu	P2 (Solid)		3.36E+02	Ci	1.613916311	S	1.8	g/mL	0.0755	28	kL	1.605921429	6.66E+00	uCi/g	0.141569678
241-AX-104	Ag	Total		2.08E+01	kg		S									
241-AX-104	B	Total		7.43E+00	kg		S									
241-AX-104	Ba	Total		9.31E+01	kg		S									

Suplemantal Analytes calculation Detail, Downloaded January 7, 2015																
Tank Name	Analyte	Waste Type	Qualifier	Inventory	Units	Inventory RSD	Basis	Density	Units	Density RSD	Volume	Units	Volume RSD	Concentration	Units	Concentration RSD
241-AX-104	Be	Total		6.02E-01	kg		S/E									
241-AX-104	Cd	Total		8.20E+01	kg		S									
241-AX-104	Ce	Total		1.42E+02	kg		S									
241-AX-104	Co	Total		7.55E+00	kg		S									
241-AX-104	Cu	Total		5.30E+01	kg		S									
241-AX-104	Li	Total		1.83E+00	kg		S									
241-AX-104	Mg	Total		7.72E+01	kg		S									
241-AX-104	Nd	Total		2.24E+02	kg		S									
241-AX-104	Free OH	Total		3.70E-01	kg		C									
241-AX-104	Aroclors (Total PCB)	Total		1.26E+00	kg		E									
241-AX-104	Th	Total		6.66E-08	kg		TE									
241-AX-104	Ti	Total		1.67E+01	kg		S									
241-AX-104	Zn	Total		5.92E+01	kg		S									
241-AX-104	239/240Pu	Total		3.36E+02	Ci		S									
NOTE: The water concentration is applicable to the time of sampling and may change with time; no water inventory is calculated.																

A.3 HTWOS TANK WASTE RESIDUAL INVENTORY AND COMPOSITION ESTIMATES

HTWOS Run:	MMR-50027_Run2-7.8-8.3r1-2015-02-10-at-03-33-29									
Inventories for 300 ft3 post-retrieval volume in tanks. Radionuclides decayed to 1/1/2062										
Chemical Species	**A-101**	**A-102**	**A-103**	**A-104**	**A-105**	**A-106**	**AX-101**	**AX-102**	**AX-103**	**AX-104**
Ag+	4.028E+00	0.000E+00	7.738E+00	0.000E+00	0.000E+00	2.396E+01	4.782E+00	0.000E+00	0.000E+00	9.131E+00
Al(OH)3	1.310E+04	7.557E+03	3.708E+03	0.000E+00	0.000E+00	0.000E+00	1.377E+04	1.158E+03	6.031E+03	0.000E+00
Al(OH)4-	7.003E-03	2.543E-03	8.129E-03	0.000E+00	0.000E+00	0.000E+00	5.520E-03	1.196E-03	5.172E-03	0.000E+00
Al+3	1.852E+02	2.732E+02	2.896E+03	4.200E+02	6.159E+02	1.964E+03	4.359E+01	3.655E+02	2.232E+02	1.841E+01
AlOOH	3.522E+02	0.000E+00	0.000E+00	2.232E+03	1.059E+03	0.000E+00	0.000E+00	0.000E+00	2.857E+02	2.557E+03
As+5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.519E-05	0.000E+00	0.000E+00	0.000E+00
B+3	6.582E-05	7.698E-06	1.298E-05	0.000E+00	0.000E+00	1.184E-05	6.229E-05	0.000E+00	0.000E+00	1.555E-05
Ba+2	1.089E+01	0.000E+00	0.000E+00	2.313E+01	0.000E+00	1.420E+02	7.040E+00	1.800E+01	0.000E+00	4.080E+01
Be+2	3.582E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.760E-06	0.000E+00	0.000E+00	1.260E-06
Bi+3	1.417E-05	1.227E+01	5.967E-05	2.844E-07	0.000E+00	2.459E+00	1.186E-05	2.687E-06	4.997E-06	0.000E+00
C10H12N2O8-4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C10H15N2O7-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C12H27O4P	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C13H28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C2Cl4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C2H3O2-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C2H3O3-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C2HCl3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C2O4-2	1.020E-02	4.036E-03	6.643E-03	0.000E+00	4.369E+03	6.386E-03	7.550E-03	5.504E+03	4.022E+03	3.486E-02
C3H6O	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C4H10O	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C4H8O	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C5H5N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C6H5NO2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C6H5O7-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C6H6	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C7H6N2O4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C7H8O	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ca+2	1.547E+02	5.057E+01	4.745E+02	3.053E+02	2.751E+02	4.548E+02	1.062E+02	9.136E+01	7.055E+01	2.672E+02
Cd+2	2.620E+00	0.000E+00	6.262E+00	0.000E+00	0.000E+00	3.312E+00	1.964E+00	0.000E+00	0.000E+00	3.574E+01
Ce+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.414E+01	0.000E+00	0.000E+00	6.223E+01
CH2Cl2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHCl3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHO2-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cl-	2.867E-03	3.376E-03	2.966E-03	4.564E-04	2.396E-05	4.277E-03	2.282E-03	1.113E-04	1.595E-03	3.298E-05
CN-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co+3	7.792E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.166E+00	2.828E+00	0.000E+00	0.000E+00	3.308E+00
CO3-2	2.679E+00	1.542E+00	2.455E+00	6.347E+00	5.430E+00	9.688E+00	1.678E+00	1.490E+01	6.243E+00	1.615E+01
Cr(OH)4-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cr(TOTAL)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CrO4-2	7.103E-04	1.399E-04	1.234E-04	1.270E-04	1.607E-04	5.691E-04	1.625E-04	9.332E-06	3.417E-04	5.971E-05
CrOOH	1.151E+03	1.023E+03	6.470E+02	4.702E+01	7.684E+01	6.577E+02	1.018E+03	6.027E+01	5.978E+02	1.167E+01
Cs+	4.906E-06	3.069E-06	3.457E-06	8.872E-06	1.119E-06	2.543E-06	4.356E-06	1.015E-06	2.321E-06	4.207E-06
Cu+2	2.763E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.226E+00	1.339E+00	0.000E+00	0.000E+00	2.325E+01
F-	3.939E-04	9.727E-05	3.553E-04	7.484E-06	7.742E-06	5.610E-05	4.287E-04	6.044E-05	2.674E-04	1.065E-05

Chemical Species	A-101	A-102	A-103	A-104	A-105	A-106	AX-101	AX-102	AX-103	AX-104
Fe+3	6.896E+01	1.418E+03	1.464E+02	5.207E+03	2.518E+03	2.275E+03	1.270E+02	2.398E+03	8.929E+02	5.975E+03
H+	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.434E-04	0.000E+00	0.000E+00	1.985E-04	1.825E-04	5.376E-04
H2O	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03	3.233E+03
H2O2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Hg+2	1.359E-06	3.521E-07	8.022E-07	1.294E-04	9.842E-06	2.526E-04	3.586E-06	7.754E-06	2.600E-06	1.731E-05
K+	2.214E-03	1.514E-03	1.573E-03	2.021E-04	9.605E-06	1.418E-03	1.965E-03	6.287E-05	1.000E-03	1.689E-05
La+3	2.459E+00	7.474E+00	1.455E-04	1.365E+00	5.764E+01	7.580E+00	1.154E-04	2.567E+00	1.108E+01	3.247E+01
Li+	2.816E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.307E-05	0.000E+00	0.000E+00	3.822E-06
Mg+2	0.000E+00	0.000E+00	2.167E+02	5.006E+01	0.000E+00	2.452E+02	1.438E+01	2.368E+01	0.000E+00	3.385E+01
Mn+4	2.504E+01	2.454E+02	3.515E+01	7.300E+02	8.550E+01	1.220E+02	7.136E+00	1.960E+02	1.238E+02	1.035E+02
MnO2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MnO4-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Mo+6	4.483E-05	1.952E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.446E-05	0.000E+00	0.000E+00	0.000E+00
Na+	1.541E-01	6.014E-02	1.191E-01	1.141E-01	2.282E+03	7.715E-02	1.299E-01	2.875E+03	2.101E+03	2.058E-02
Nd+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.362E+01	0.000E+00	0.000E+00	9.816E+01
NH3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NH4+	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni+2	3.975E+01	3.053E+01	3.798E+01	3.390E+02	3.665E+02	5.389E+01	2.084E+01	5.575E+01	5.426E+01	3.219E+02
NO2-	5.354E-02	4.251E-02	4.917E-02	2.389E-02	9.976E-04	4.499E-02	4.380E-02	5.182E-03	2.687E-02	9.375E-04
NO3-	9.711E-02	4.611E-02	6.865E-02	9.649E-04	4.260E-03	4.872E-02	8.851E-02	2.630E-02	3.372E-02	4.769E-03
O(BOUND)	2.567E+02	9.264E+02	3.611E+03	5.693E+02	7.299E+02	3.794E+03	1.936E+02	4.808E+02	2.741E+02	3.889E+01
OH(BOUND)	2.209E+02	1.359E+03	5.604E+02	5.218E+03	2.746E+03	2.532E+03	2.254E+02	2.305E+03	9.071E+02	5.928E+03
OH-	1.580E-02	5.866E-03	1.773E-02	5.021E-02	7.765E-03	1.362E-04	1.263E-02	2.646E-03	1.006E-02	7.243E-03
Pb+2	1.310E-04	4.808E-04	6.870E-05	2.037E-04	7.100E-04	6.564E-04	5.306E-05	4.523E-04	1.923E-04	9.773E-04
Pd+2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PO4-3	3.864E-03	2.453E-03	3.635E-03	2.006E-03	2.446E-03	3.386E-02	2.344E-03	1.189E-03	1.718E-03	2.640E-04
Pr+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu+4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Rb+	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Rh+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ru+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sb+5	4.298E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.111E-05	0.000E+00	0.000E+00	0.000E+00
Se+6	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.516E-05	0.000E+00	0.000E+00	0.000E+00
Si+4	1.004E+01	2.822E+02	2.980E+03	3.150E+02	4.343E+02	3.309E+03	1.550E+01	1.036E-03	1.056E+02	1.892E+01
SO4-2	1.853E-02	1.790E-03	9.055E-03	5.307E-03	2.268E-03	2.404E-03	1.573E-02	4.722E-04	4.092E-03	4.997E-04
Sr+2	2.097E+00	2.073E+00	2.933E-01	7.112E+00	5.918E+00	4.052E+00	3.045E-01	2.151E+01	8.619E+00	1.511E+01
Ta+5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Tc+7	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Te+6	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th+4	1.926E-05	2.549E-05	9.574E-05	0.000E+00	0.000E+00	0.000E+00	7.538E-06	0.000E+00	1.819E-05	0.000E+00
Ti+4	2.184E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.414E+00	0.000E+00	0.000E+00	7.300E+00
Tl+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOC	2.267E-03	4.042E-03	2.677E-03	0.000E+00	0.000E+00	2.469E-03	1.079E-03	5.329E-03	7.677E-04	5.975E-07
U(TOTAL)	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
V+5	1.091E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.066E+00	0.000E+00	0.000E+00	0.000E+00
W+6	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y+3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Zn+2	1.712E-05	0.000E+00	3.031E-05	0.000E+00	0.000E+00	0.000E+00	2.349E-05	0.000E+00	0.000E+00	1.239E-04
Zr+4	1.451E+01	3.453E+01	5.336E+01	3.492E+00	1.550E+02	1.036E+02	4.609E+00	6.625E+00	3.018E+01	8.710E+01

HTWOS Run:	MMR-50027_Run2-7.8-8.3r1-2015-02-10-at-03-33-29									
Inventories for 300 ft3 post-retrieval volume in tanks. Radionuclides decayed to 1/1/2062										
Radionuclide	**A-101**	**A-102**	**A-103**	**A-104**	**A-105**	**A-106**	**AX-101**	**AX-102**	**AX-103**	**AX-104**
106Ru	7.467E-29	2.672E-29	3.230E-29	2.988E-28	1.374E-28	6.991E-27	1.346E-28	7.751E-27	1.099E-28	6.846E-28
113mCd	4.294E-01	1.029E-06	5.074E-01	4.854E-07	7.965E-08	9.127E-02	4.372E-01	3.817E-07	6.021E-07	2.917E-02
125Sb	7.546E-13	3.694E-13	4.249E-13	6.543E-11	3.530E-12	1.378E-11	6.422E-13	1.786E-10	5.549E-12	2.332E-11
126Sn	1.514E-06	1.311E-06	1.447E-06	7.194E-07	1.052E-07	5.668E-07	1.273E-06	1.099E-06	6.235E-07	1.851E-07
129I	9.313E-08	4.071E-08	6.327E-04	2.573E-08	4.359E-10	6.170E-08	7.806E-08	1.720E-08	3.358E-08	7.665E-10
134Cs	2.450E-16	1.539E-16		2.316E-15	2.529E-16	3.537E-16	1.933E-16	4.567E-17	1.323E-16	4.447E-16
137Cs	3.182E-02	1.990E-02	2.242E-02	5.754E-02	7.258E-03	1.649E-02	2.825E-02	6.581E-03	1.505E-02	2.728E-02
137mBa	3.004E-02	1.879E-02	2.116E-02	5.431E-02	6.852E-03	1.557E-02	2.666E-02	6.212E-03	1.421E-02	2.576E-02
14C	2.607E-06	4.700E-07	1.376E-06	1.302E-06	1.263E-07	5.029E-07	2.162E-06	6.737E-08	8.535E-07	2.221E-07
151Sm	1.480E+03	3.917E+02	1.268E+03	4.931E+03	1.204E+04	2.740E+04	2.035E+03	9.128E+03	2.736E+03	8.653E+03
152Eu	4.974E-02	5.256E-03	1.714E-02	8.144E-02	8.462E-01	4.628E-01	3.190E-02	4.051E-01	1.685E-01	6.080E-01
154Eu	6.484E-01	6.650E-02	2.167E-01	2.122E+00	3.532E+00	5.882E+00	4.014E-01	2.699E+00	3.596E+00	3.568E+00
155Eu	6.401E-03	5.644E-04	1.872E-03	1.035E-02	1.351E-02	5.410E-02	3.575E-03	2.677E-02	2.287E-02	4.101E-02
226Ra	2.842E-11	1.804E-11	2.093E-11	6.699E-12	9.996E-13	9.827E-12	2.371E-11	5.789E-12	9.925E-12	1.757E-12
227Ac	7.732E-03	3.717E-03	1.032E-02	3.596E-06	2.856E-06	8.300E-04	8.533E-03	1.773E-03	3.624E-03	2.050E-06
228Ra	1.330E-05	6.401E-06	1.775E-05	3.290E-07	4.451E-12	1.654E-06	1.468E-05	4.453E-04	2.447E-05	3.200E-12
229Th	3.663E-06	1.759E-06	4.896E-06	1.290E-07	3.161E-09	4.823E-07	4.039E-06	8.399E-07	1.718E-06	2.276E-09
231Pa	1.005E-02	4.833E-03	1.341E-02	4.675E-06	3.713E-06	1.079E-03	1.110E-02	2.306E-03	4.712E-03	2.666E-06
232Th	1.335E-05	6.427E-06	1.782E-05	3.303E-07	4.469E-12	1.661E-06	1.474E-05	4.470E-04	2.457E-05	3.212E-12
232U	2.902E-03	4.934E-02	7.536E-03	3.493E-04	4.927E-09	5.132E-04	2.315E-03	3.635E-03	1.208E-03	1.054E-06
233U	3.198E-01	5.438E+00	8.306E-01	3.915E-02	1.634E-08	5.655E-02	2.550E-01	4.005E-01	1.840E-02	3.492E-06
234U	5.780E-02	9.509E-01	1.482E-01	1.030E-01	1.156E-04	2.437E-02	6.381E-02	7.599E-02	2.098E-02	2.474E-02
235U	2.346E-03	3.855E-02	6.013E-03	4.334E-03	4.838E-06	1.012E-03	2.619E-03	3.096E-03	5.528E-04	1.034E-03
236U	1.514E-03	2.493E-02	3.879E-03	2.473E-03	2.979E-06	6.263E-04	1.675E-03	2.129E-03	7.388E-04	6.364E-04
237Np	1.631E-01	5.876E-02	1.717E-01	1.016E-02	1.001E-02	2.988E-02	1.783E-01	1.016E-01	8.909E-03	7.194E-03
238Pu	2.709E-01	3.270E+00	8.719E-01	2.519E+00	2.175E+00	3.410E+00	3.176E-01	3.346E+00	4.504E-01	3.506E+00
238U	5.205E-02	8.538E-01	1.334E-01	1.025E-01	1.130E-04	2.313E-02	5.873E-02	6.736E-02	1.297E-02	2.418E-02
239Pu	9.599E+00	1.255E+02	3.466E+01	1.199E+02	7.308E+01	1.382E+02	1.213E+01	5.689E+01	1.521E+01	1.178E+02
240Pu	2.292E+00	2.899E+01	7.923E+00	2.610E+01	1.785E+01	3.138E+01	2.802E+00	1.816E+01	3.819E+00	2.878E+01
241Am	4.226E+01	9.771E+01	2.619E+01	1.342E+02	6.788E+02	7.702E+01	3.865E+01	7.411E+02	1.343E+02	3.851E+02
241Pu	1.094E+00	1.392E+01	3.628E+00	8.985E+00	8.492E+00	1.360E+01	1.288E+00	1.658E+01	1.764E+00	1.369E+01
242Cm	1.033E-07	2.958E-07	4.573E-08	1.393E-06	9.645E-07	3.072E-07	6.578E-08	2.468E-06	2.414E-07	1.321E-06
242Pu	1.691E-04	2.181E-03	5.637E-04	1.311E-03	1.300E-03	2.092E-03	2.003E-04	2.792E-03	2.704E-04	2.096E-03
243Am	2.552E-02	5.704E-02	1.569E-02	7.081E-02	3.936E-01	4.062E-02	2.554E-02	7.316E-01	7.815E-02	2.202E-01
243Cm	1.736E-09	3.722E-09	5.821E-10	2.124E-08	1.822E-08	5.403E-09	1.382E-09	7.986E-08	4.516E-09	2.495E-08
244Cm	1.701E-08	3.779E-08	5.895E-09	2.088E-07	1.765E-07	5.432E-08	1.392E-08	8.079E-07	4.378E-08	2.416E-07
3H	3.005E-07	1.559E-07	1.885E-07	2.321E-07	1.632E-08	1.806E-07	2.494E-07	7.241E-08	9.831E-08	2.870E-08
59Ni	1.712E+00	6.129E-01	1.837E+00	1.737E+00	1.698E+00	1.507E+00	1.801E+00	6.409E-01	1.016E+00	1.220E+00
60Co	2.541E-03	3.579E-03	1.173E-03	1.144E-02	1.959E-02	3.216E-03	2.309E-03	1.848E-02	6.901E-03	3.156E-02
63Ni	1.071E+02	3.833E+01	1.149E+02	1.081E+02	1.070E+02	9.376E+01	1.126E+02	4.029E+01	6.371E+01	7.689E+01
79Se	5.934E-07	3.856E-07	4.456E-07	3.582E-07	5.216E-08	2.802E-07	4.938E-07	3.622E-08	2.169E-07	9.172E-08
90Sr	3.591E+03	7.701E+03	4.482E+03	1.002E+05	9.376E+04	1.621E+04	5.380E+03	1.072E+04	2.213E+04	2.227E+05
90Y	3.591E+03	7.701E+03	4.482E+03	1.002E+05	9.376E+04	1.621E+04	5.380E+03	1.072E+04	2.213E+04	2.227E+05
93Zr	4.927E+00	2.353E+00	6.546E+00	4.740E-01	7.079E-01	1.021E+00	5.411E+00	1.187E+00	2.431E+00	5.086E-01
93mNb	4.857E+00	2.320E+00	6.454E+00	4.675E-01	6.973E-01	1.006E+00	5.334E+00	1.170E+00	2.396E+00	5.010E-01
99Tc	9.165E-05	6.893E-05	7.860E-05	4.985E-05	7.257E-06	1.448E-04	7.655E-05	6.440E-06	3.485E-05	4.306E-05
Radionuclide Decay Date: 1/1/2062										

Residual Waste Inventory Calculations from HTWOS Download

Inventories scaled to 360 ft3 residual volume and radionuclides decayed to 1/1/2020 from 1/1/2062

Chemicals	Units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A-Farm	AX-101	AX-102	AX-103	AX-104	Sum AX-Farm
Al	kg	5.81E+03	3.41E+03	4.43E+03	1.62E+03	1.19E+03	1.96E+03	1.84E+04	5.76E+03	8.46E+02	2.88E+03	1.40E+03	1.09E+04
Bi+3	kg	1.70E-05	1.47E+01	7.16E-05	3.41E-07	0.00E+00	2.95E+00	1.77E+01	1.42E-05	3.22E-06	6.00E-06	0.00E+00	2.35E-05
Ca+2	kg	1.86E+02	6.07E+01	5.69E+02	3.66E+02	3.30E+02	5.46E+02	2.06E+03	1.27E+02	1.10E+02	8.47E+01	3.21E+02	6.42E+02
Cl-	kg	3.44E-03	4.05E-03	3.56E-03	5.48E-04	2.88E-05	5.13E-03	1.68E-02	2.74E-03	1.34E-04	1.91E-03	3.96E-05	4.83E-03
TIC as CO3	kg	3.21E+00	1.85E+00	2.95E+00	7.62E+00	6.52E+00	1.16E+01	3.38E+01	2.01E+00	1.79E+01	7.49E+00	1.94E+01	4.68E+01
Cr	kg	7.04E+02	6.26E+02	3.96E+02	2.88E+01	4.70E+01	4.02E+02	2.20E+03	6.23E+02	3.69E+01	3.66E+02	7.14E+00	1.03E+03
F-	kg	4.73E-04	1.17E-04	4.26E-04	8.98E-06	9.29E-06	6.73E-05	1.10E-03	5.14E-04	7.25E-05	3.21E-04	1.28E-05	9.21E-04
Fe+3	kg	8.28E+01	1.70E+03	1.76E+02	6.25E+03	3.02E+03	2.73E+03	1.40E+04	1.52E+02	2.88E+03	1.07E+03	7.17E+03	1.13E+04
Hg+2	kg	1.63E-06	4.23E-07	9.63E-07	1.55E-04	1.18E-05	3.03E-04	4.73E-04	4.30E-06	9.30E-06	3.12E-06	2.08E-05	3.75E-05
K+	kg	2.66E-03	1.82E-03	1.89E-03	2.43E-04	1.15E-05	1.70E-03	8.32E-03	2.36E-03	7.54E-05	1.20E-03	2.03E-05	3.65E-03
La+3	kg	2.95E+00	8.97E+00	1.75E-04	1.64E+00	6.92E+01	9.10E+00	9.18E+01	1.39E-04	3.08E+00	1.33E+01	3.90E+01	5.53E+01
Mn	kg	2.50E+01	2.45E+02	3.51E+01	7.30E+02	8.55E+01	1.22E+02	1.24E+03	7.14E+00	1.96E+02	1.24E+02	1.04E+02	4.30E+02
Na+	kg	1.85E-01	7.22E-02	1.43E-01	1.37E-01	2.74E+03	9.26E-02	2.74E+03	1.56E-01	3.45E+03	2.52E+03	2.47E-02	5.97E+03
Ni+2	kg	4.77E+01	3.66E+01	4.56E+01	4.07E+02	4.40E+02	6.47E+01	1.04E+03	2.50E+01	6.69E+01	6.51E+01	3.86E+02	5.43E+02
NO2-	kg	6.42E-02	5.10E-02	5.90E-02	2.87E-02	1.20E-03	5.40E-02	2.58E-01	5.26E-02	6.22E-03	3.22E-02	1.13E-03	9.22E-02
NO3-	kg	1.17E-01	5.53E-02	8.24E-02	1.16E-03	5.11E-03	5.85E-02	3.19E-01	1.06E-01	3.16E-02	4.05E-02	5.72E-03	1.84E-01
Pb+2	kg	1.57E-04	5.77E-04	8.24E-05	2.44E-04	8.52E-04	7.88E-04	2.70E-03	6.37E-05	5.43E-04	2.31E-04	1.17E-03	2.01E-03
PO4-3	kg	4.64E-03	2.94E-03	4.36E-03	2.41E-03	2.93E-03	4.06E-02	5.79E-02	2.81E-03	1.43E-03	2.06E-03	3.17E-04	6.62E-03
Si+4	kg	1.20E+01	3.39E+02	3.58E+03	3.78E+02	5.21E+02	3.97E+03	8.80E+03	1.86E+01	1.24E-03	1.27E+02	2.27E+01	1.68E+02
SO4-2	kg	2.22E-02	2.15E-03	1.09E-02	6.37E-03	2.72E-03	2.89E-03	4.72E-02	1.89E-02	5.67E-04	4.91E-03	6.00E-04	2.50E-02
Sr+2	kg	2.52E+00	2.49E+00	3.52E-01	8.53E+00	7.10E+00	4.86E+00	2.59E+01	3.65E-01	2.58E+01	1.03E+01	1.81E+01	5.46E+01
TOC	kg	2.72E-03	4.85E-03	3.21E-03	0.00E+00	0.00E+00	2.96E-03	1.37E-02	1.30E-03	6.39E-03	9.21E-04	7.17E-07	8.61E-03
U(TOTAL)	kg	1.56E+02	2.56E+03	4.00E+02	3.07E+02	3.39E-01	6.93E+01	3.49E+03	1.76E+02	2.02E+02	3.89E+01	7.24E+01	4.89E+02
Zr+4	kg	1.74E+01	4.14E+01	6.40E+01	4.19E+00	1.86E+02	1.24E+02	4.37E+02	5.53E+00	7.95E+00	3.62E+01	1.05E+02	1.54E+02
Sum	kg	7.05E+03	9.05E+03	9.70E+03	1.01E+04	8.64E+03	1.00E+04	5.46E+04	6.90E+03	7.84E+03	7.35E+03	9.66E+03	3.17E+04

Residual Waste Inventory Calculations from HTWOS Download

Inventories scaled to 360 ft3 residual volume and radionuclides decayed to 1/1/2020 from 1/1/2062

Radionuclide	Units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A-Farm	AX-101	AX-102	AX-103	AX-104	Sum AX-Farm
106Ru	Ci	2.23E-16	7.98E-17	9.64E-17	8.92E-16	4.10E-16	2.09E-14	2.26E-14	4.02E-16	2.31E-14	3.28E-16	2.04E-15	2.59E-14
113mCd	Ci	4.06E+00	9.74E-06	4.80E+00	4.59E-06	7.53E-07	8.63E-01	9.73E+00	4.14E+00	3.61E-06	5.70E-06	2.76E-01	4.41E+00
125Sb	Ci	3.48E-08	1.70E-08	1.96E-08	3.02E-06	1.63E-07	6.35E-07	3.88E-06	2.96E-08	8.23E-06	2.56E-07	1.07E-06	9.59E-06
126Sn	Ci	1.82E-06	1.57E-06	1.74E-06	8.63E-07	1.26E-07	6.80E-07	6.80E-06	1.53E-06	1.32E-06	7.48E-07	2.22E-07	3.82E-06
129I	Ci	1.12E-07	4.88E-08	7.59E-04	3.09E-08	5.23E-10	7.40E-08	7.59E-04	9.37E-08	2.06E-08	4.03E-08	9.20E-10	1.56E-07
134Cs	Ci	3.90E-10	2.45E-10	0.00E+00	3.69E-09	4.03E-10	5.63E-10	5.29E-09	3.08E-10	7.27E-11	2.11E-10	7.08E-10	1.30E-09
137Cs	Ci	1.01E-01	6.29E-02	7.08E-02	1.82E-01	2.29E-02	5.21E-02	4.91E-01	8.93E-02	2.08E-02	4.76E-02	8.62E-02	2.44E-01
137mBa	Ci	8.96E-02	5.60E-02	6.31E-02	1.62E-01	2.04E-02	4.64E-02	4.38E-01	7.95E-02	1.85E-02	4.24E-02	7.68E-02	2.17E-01
14C	Ci	3.14E-06	5.67E-07	1.66E-06	1.57E-06	1.52E-07	6.07E-07	7.70E-06	2.61E-06	8.13E-08	1.03E-06	2.68E-07	3.99E-06
151Sm	Ci	2.45E+03	6.50E+02	2.10E+03	8.18E+03	2.00E+04	4.54E+04	7.88E+04	3.37E+03	1.51E+04	4.54E+03	1.44E+04	3.74E+04
152Eu	Ci	5.12E-01	5.42E-02	1.77E-01	8.39E-01	8.72E+00	4.77E+00	1.51E+01	3.29E-01	4.17E+00	1.74E+00	6.26E+00	1.25E+01
154Eu	Ci	2.30E+01	2.36E+00	7.70E+00	7.54E+01	1.25E+02	2.09E+02	4.43E+02	1.43E+01	9.59E+01	1.28E+02	1.27E+02	3.65E+02
155Eu	Ci	3.53E+00	3.11E-01	1.03E+00	5.70E+00	7.44E+00	2.98E+01	4.78E+01	1.97E+00	1.47E+01	1.26E+01	2.26E+01	5.19E+01
226Ra	Ci	3.47E-11	2.20E-11	2.56E-11	8.19E-12	1.22E-12	1.20E-11	1.04E-10	2.90E-11	7.07E-12	1.21E-11	2.15E-12	5.03E-11
227Ac	Ci	3.53E-02	1.70E-02	4.71E-02	1.64E-05	1.30E-05	3.79E-03	1.03E-01	3.90E-02	8.10E-03	1.66E-02	9.37E-06	6.37E-02
228Ra	Ci	2.50E-03	1.20E-03	3.34E-03	6.19E-05	8.37E-10	3.11E-04	7.42E-03	2.76E-03	8.37E-02	4.60E-03	6.02E-10	9.11E-02
229Th	Ci	4.41E-06	2.12E-06	5.90E-06	1.55E-07	3.81E-09	5.81E-07	1.32E-05	4.87E-06	1.01E-06	2.07E-06	2.74E-09	7.95E-06
231Pa	Ci	1.21E-02	5.80E-03	1.61E-02	5.62E-06	4.46E-06	1.30E-03	3.53E-02	1.33E-02	2.77E-03	5.66E-03	3.20E-06	2.18E-02
232Th	Ci	1.60E-05	7.71E-06	2.14E-05	3.96E-07	5.36E-12	1.99E-06	4.75E-05	1.77E-05	5.36E-04	2.95E-05	3.85E-12	5.84E-04
232U	Ci	5.28E-03	8.99E-02	1.37E-02	6.36E-04	8.97E-09	9.34E-04	1.10E-01	4.22E-03	6.62E-03	2.20E-03	1.92E-06	1.30E-02
233U	Ci	3.84E-01	6.53E+00	9.97E-01	4.70E-02	1.96E-08	6.79E-02	8.02E+00	3.06E-01	4.81E-01	2.21E-02	4.19E-06	8.09E-01
234U	Ci	6.94E-02	1.14E+00	1.78E-01	1.24E-01	1.39E-04	2.93E-02	1.54E+00	7.66E-02	9.12E-02	2.52E-02	2.97E-02	2.23E-01
235U	Ci	2.81E-03	4.63E-02	7.22E-03	5.20E-03	5.81E-06	1.21E-03	6.27E-02	3.14E-03	3.72E-03	6.63E-04	1.24E-03	8.76E-03
236U	Ci	1.82E-03	2.99E-02	4.65E-03	2.97E-03	3.57E-06	7.52E-04	4.01E-02	2.01E-03	2.55E-03	8.87E-04	7.64E-04	6.21E-03
237Np	Ci	1.96E-01	7.05E-02	2.06E-01	1.22E-02	1.20E-02	3.59E-02	5.32E-01	2.14E-01	1.22E-01	1.07E-02	8.63E-03	3.55E-01
238Pu	Ci	4.53E-01	5.47E+00	1.46E+00	4.21E+00	3.64E+00	5.70E+00	2.09E+01	5.31E-01	5.60E+00	7.53E-01	5.86E+00	1.27E+01
238U	Ci	6.25E-02	1.02E+00	1.60E-01	1.23E-01	1.36E-04	2.78E-02	1.40E+00	7.05E-02	8.08E-02	1.56E-02	2.90E-02	1.96E-01
239Pu	Ci	1.15E+01	1.51E+02	4.16E+01	1.44E+02	8.78E+01	1.66E+02	6.02E+02	1.46E+01	6.84E+01	1.83E+01	1.42E+02	2.43E+02

Radionuclide	Units	A-101	A-102	A-103	A-104	A-105	A-106	Sum A-Farm	AX-101	AX-102	AX-103	AX-104	Sum AX-Farm
240Pu	Ci	2.76E+00	3.49E+01	9.55E+00	3.15E+01	2.15E+01	3.78E+01	1.38E+02	3.38E+00	2.19E+01	4.60E+00	3.47E+01	6.46E+01
241Am	Ci	5.42E+01	1.25E+02	3.36E+01	1.72E+02	8.71E+02	9.89E+01	1.36E+03	4.96E+01	9.51E+02	1.72E+02	4.94E+02	1.67E+03
241Pu	Ci	9.92E+00	1.26E+02	3.29E+01	8.14E+01	7.70E+01	1.23E+02	4.51E+02	1.17E+01	1.50E+02	1.60E+01	1.24E+02	3.02E+02
242Cm	Ci	1.24E-07	3.55E-07	5.49E-08	1.67E-06	1.16E-06	3.69E-07	3.73E-06	7.89E-08	2.96E-06	2.90E-07	1.58E-06	4.91E-06
242Pu	Ci	2.03E-04	2.62E-03	6.76E-04	1.57E-03	1.56E-03	2.51E-03	9.14E-03	2.40E-04	3.35E-03	3.25E-04	2.52E-03	6.43E-03
243Am	Ci	3.07E-02	6.87E-02	1.89E-02	8.53E-02	4.74E-01	4.89E-02	7.27E-01	3.08E-02	8.81E-01	9.42E-02	2.65E-01	1.27E+00
243Cm	Ci	5.67E-09	1.21E-08	1.90E-09	6.93E-08	5.95E-08	1.76E-08	1.66E-07	4.51E-09	2.61E-07	1.47E-08	8.14E-08	3.61E-07
244Cm	Ci	1.02E-07	2.27E-07	3.53E-08	1.25E-06	1.06E-06	3.26E-07	3.00E-06	8.35E-08	4.84E-06	2.62E-07	1.45E-06	6.64E-06
3H	Ci	3.83E-06	1.99E-06	2.40E-06	2.96E-06	2.08E-07	2.30E-06	1.37E-05	3.18E-06	9.23E-07	1.25E-06	3.66E-07	5.72E-06
59Ni	Ci	2.05E+00	7.36E-01	2.20E+00	2.09E+00	2.04E+00	1.81E+00	1.09E+01	2.16E+00	7.69E-01	1.22E+00	1.46E+00	5.62E+00
60Co	Ci	7.64E-01	1.08E+00	3.53E-01	3.44E+00	5.89E+00	9.66E-01	1.25E+01	6.94E-01	5.55E+00	2.07E+00	9.49E+00	1.78E+01
63Ni	Ci	1.71E+02	6.14E+01	1.84E+02	1.73E+02	1.71E+02	1.50E+02	9.11E+02	1.80E+02	6.45E+01	1.02E+02	1.23E+02	4.70E+02
79Se	Ci	7.12E-07	4.63E-07	5.35E-07	4.30E-07	6.26E-08	3.36E-07	2.54E-06	5.93E-07	4.35E-08	2.60E-07	1.10E-07	1.01E-06
90Sr	Ci	1.18E+04	2.54E+04	1.48E+04	3.31E+05	3.09E+05	5.35E+04	7.46E+05	1.78E+04	3.54E+04	7.30E+04	7.35E+05	8.61E+05
90Y	Ci	1.18E+04	2.54E+04	1.48E+04	3.31E+05	3.09E+05	5.35E+04	7.46E+05	1.78E+04	3.54E+04	7.30E+04	7.35E+05	8.61E+05
93mNb	Ci	3.61E+01	1.72E+01	4.79E+01	3.47E+00	5.18E+00	7.47E+00	1.17E+02	3.96E+01	8.69E+00	1.78E+01	3.72E+00	6.98E+01
93Zr	Ci	5.83E+00	2.78E+00	7.74E+00	5.61E-01	8.37E-01	1.21E+00	1.90E+01	6.40E+00	1.40E+00	2.88E+00	6.01E-01	1.13E+01
99Tc	Ci	1.10E-04	8.27E-05	9.43E-05	5.98E-05	8.71E-06	1.74E-04	5.29E-04	9.19E-05	7.73E-06	4.18E-05	5.17E-05	1.93E-04
SUM	Ci	2.65E+04	5.20E+04	3.21E+04	6.70E+05	6.40E+05	1.53E+05	1.57E+06	3.92E+04	8.73E+04	1.51E+05	1.49E+06	1.76E+06
Radionuclides decayed to 1/1/2020													

SPREADSHEET FOR DATA ENTRY AND DECAY CALCULATION (SVF-2545)

Decay from	1/1/2062
Decay to	1/1/2020
Days of Decay	-15341

Radionuclide	Alt Radionuclide Name	Half Life (years)	Lambda (1/day)	Decay Factor
Ru-106	106Ru	1.020	1.861E-03	2.4875E+12
Cd-113m	113mCd	14.1	1.346E-04	7.8834
Sb-125	125Sb	2.758	6.881E-04	3.8403E+04
Sn-126	126Sn	2.3E+05	8.251E-09	1.0001
I-129	129I	1.57E+07	1.209E-10	1.0000
Cs-134	134Cs	2.065	9.190E-04	1.3269E+06
Cs-137	137Cs	30.07	6.311E-05	2.6331
Ba-137m	137mBa	4.852E-06	3.911E+02	2.4857
C-14	14C	5715	3.321E-07	1.0051
Sm-151	151Sm	90	2.109E-05	1.3819
Eu-152	152Eu	13.54	1.402E-04	8.5862
Eu-154	154Eu	8.593	2.208E-04	29.6068
Eu-155	155Eu	4.75	3.995E-04	459.0137
Ra-226	226Ra	1599	1.187E-06	1.0184
Ac-227 (2nd Order)	227Ac	21.772	8.716E-05	3.8083
Ra-228 (2nd Order)	228Ra	5.76	3.295E-04	156.7047
Th-229	229Th	7.3E+03	2.600E-07	1.0040
Pa-231	231Pa	3.28E+04	5.786E-08	1.0009
Th-232	232Th	1.40E+10	1.356E-13	1.0000
U-232	232U	69.8	2.719E-05	1.5175
U-233	233U	1.592E+05	1.192E-08	1.0002
U-234	234U	2.46E+05	7.714E-09	1.0001
U-235	235U	7.04E+08	2.696E-12	1.0000
U-236	236U	2.342E+07	8.103E-11	1.0000
Np-237	237Np	2.14E+06	8.868E-10	1.0000
Pu-238	238Pu	87.7	2.164E-05	1.3937
U-238	238U	4.47E+09	4.245E-13	1.0000
Pu-239	239Pu	2.410E+04	7.874E-08	1.0012
Pu-240	240Pu	6.56E+03	2.893E-07	1.0044
Am-241 (2nd Order)	241Am	432.7	4.386E-06	1.0696
Pu-241	241Pu	14.4	1.318E-04	7.5515
Cm-242	242Cm	4.46E-01		0.9999
Pu-242	242Pu	3.75E+05	5.061E-09	1.0001
Am-243	243Am	7.37E+03	2.575E-07	1.0040
Cm-243	243Cm	29.1	6.521E-05	2.7195
Cm-244	244Cm	18.1	1.048E-04	4.9951
H-3	3H	12.32	1.540E-04	10.6236
Ni-59	59Ni	7.6E+04	2.497E-08	1.0004
Co-60	60Co	5.271	3.600E-04	250.4515
Ni-63	63Ni	101	1.879E-05	1.3341

Radionuclide	Alt Radionuclide Name	Half Life (years)	Lambda (1/day)	Decay Factor
Se-79	79Se	2.9E+05	6.544E-09	1.0001
Sr-90	90Sr	28.78	6.594E-05	2.7499
Y-90	90Y	7.31E-03	2.596E-01	2.7499
Nb-93m (2nd Order)	93mNb	16.1	1.179E-04	6.0999
Zr-93	93Zr	1.5E+06	1.265E-09	1.0000
Tc-99	99Tc	2.13E+05	8.910E-09	1.0001

All half-lives taken from the Sixteenth Edition of the Chart of the Nuclides.

Variables for Residual Waste Calculations		
Al Compounds		**Molecular Weights**
Al(OH)3		78.00356
Al(OH)4-		95.0109
Al+3		26.98154
AlOOH		59.98828
Cr Compounds		
Cr(OH)4-		120.0255
Cr(TOTAL)		51.9961
CrO4-2		115.9937
CrOOH		85.00284
Miscellaneous Compounds		
Hydrogen		1.00794
Oxygen		15.9994
Mn Compounds		
Mn+4		54.93805
MnO2		86.93685
MnO4-		118.9356
U Isotope		Specific Activity, Ci per gram
232-U		22.07774
233-U		0.009638
234-U		0.006211
235-U		2.16E-06
236-U		6.47E-05
238-U		3.36E-07

HTWOS Residual Concentrations																	
Inventories divided by 360 ft3. Radionuclides decayed to 1/1/2020																	
	Volume														**Mass**		
Chemicals	**Units**	**A-101**	**A-102**	**A-103**	**A-104**	**A-105**	**A-106**	**Avg A-Farm**	**AX-101**	**AX-102**	**AX-103**	**AX-104**	**Avg AX-Farm**		**Units**	**Avg A-Farm**	**Avg AX-Farm**
Al	g/L	5.70E+02	3.35E+02	4.35E+02	1.59E+02	1.16E+02	1.93E+02	3.01E+02	5.65E+02	8.30E+01	2.83E+02	1.37E+02	2.67E+02		mg/kg	1.12E+05	9.96E+04
Bi+3	g/L	1.67E-06	1.44E+00	7.02E-06	3.35E-08	0.00E+00	2.89E-01	2.89E-01	1.40E-06	3.16E-07	5.88E-07	0.00E+00	5.75E-07		mg/kg	1.08E+02	2.15E-04
Ca+2	g/L	1.82E+01	5.95E+00	5.59E+01	3.59E+01	3.24E+01	5.35E+01	3.36E+01	1.25E+01	1.08E+01	8.31E+00	3.15E+01	1.58E+01		mg/kg	1.26E+04	5.88E+03
Cl-	g/L	3.38E-04	3.97E-04	3.49E-04	5.37E-05	2.82E-06	5.03E-04	2.74E-04	2.69E-04	1.31E-05	1.88E-04	3.88E-06	1.18E-04		mg/kg	1.02E-01	4.42E-02
TIC as CO3	g/L	3.15E-01	1.81E-01	2.89E-01	7.47E-01	6.39E-01	1.14E+00	5.52E-01	1.97E-01	1.75E+00	7.35E-01	1.90E+00	1.15E+00		mg/kg	2.06E+02	4.28E+02
Cr	g/L	6.91E+01	6.14E+01	3.88E+01	2.82E+00	4.61E+00	3.95E+01	3.60E+01	6.11E+01	3.62E+00	3.59E+01	7.00E-01	2.53E+01		mg/kg	1.34E+04	9.45E+03
F-	g/L	4.64E-05	1.15E-05	4.18E-05	8.81E-07	9.11E-07	6.60E-06	1.80E-05	5.05E-05	7.11E-06	3.15E-05	1.25E-06	2.26E-05		mg/kg	6.72E-03	8.43E-03
Fe+3	g/L	8.12E+00	1.67E+02	1.72E+01	6.13E+02	2.96E+02	2.68E+02	2.28E+02	1.50E+01	2.82E+02	1.05E+02	7.03E+02	2.76E+02		mg/kg	8.52E+04	1.03E+05
Hg+2	g/L	1.60E-07	4.15E-08	9.44E-08	1.52E-05	1.16E-06	2.97E-05	7.74E-06	4.22E-07	9.13E-07	3.06E-07	2.04E-06	9.20E-07		mg/kg	2.89E-03	3.43E-04
K+	g/L	2.61E-04	1.78E-04	1.85E-04	2.38E-05	1.13E-06	1.67E-04	1.36E-04	2.31E-04	7.40E-06	1.18E-04	1.99E-06	8.96E-05		mg/kg	5.07E-02	3.34E-02
La+3	g/L	2.89E-01	8.80E-01	1.71E-05	1.61E-01	6.79E+00	8.92E-01	1.50E+00	1.36E-05	3.02E-01	1.30E+00	3.82E+00	1.36E+00		mg/kg	5.60E+02	5.06E+02
Mn	g/L	2.46E+00	2.41E+01	3.45E+00	7.16E+01	8.39E+00	1.20E+01	2.03E+01	7.00E-01	1.92E+01	1.21E+01	1.02E+01	1.06E+01		mg/kg	7.58E+03	3.94E+03
Na+	g/L	1.81E-02	7.08E-03	1.40E-02	1.34E-02	2.69E+02	9.08E-03	4.48E+01	1.53E-02	3.38E+02	2.47E+02	2.42E-03	1.46E+02		mg/kg	1.67E+04	5.46E+04
Ni+2	g/L	4.68E+00	3.59E+00	4.47E+00	3.99E+01	4.31E+01	6.34E+00	1.70E+01	2.45E+00	6.56E+00	6.39E+00	3.79E+01	1.33E+01		mg/kg	6.35E+03	4.97E+03
NO2-	g/L	6.30E-03	5.00E-03	5.79E-03	2.81E-03	1.17E-04	5.30E-03	4.22E-03	5.16E-03	6.10E-04	3.16E-03	1.10E-04	2.26E-03		mg/kg	1.57E+00	8.43E-01
NO3-	g/L	1.14E-02	5.43E-03	8.08E-03	1.14E-04	5.01E-04	5.73E-03	5.22E-03	1.04E-02	3.10E-03	3.97E-03	5.61E-04	4.51E-03		mg/kg	1.95E+00	1.68E+00
Pb+2	g/L	1.54E-05	5.66E-05	8.09E-06	2.40E-05	8.36E-05	7.73E-05	4.42E-05	6.25E-06	5.32E-05	2.26E-05	1.15E-04	4.93E-05		mg/kg	1.65E-02	1.84E-02
PO4-3	g/L	4.55E-04	2.89E-04	4.28E-04	2.36E-04	2.88E-04	3.99E-03	9.47E-04	2.76E-04	1.40E-04	2.02E-04	3.11E-05	1.62E-04		mg/kg	3.53E-01	6.06E-02
Si+4	g/L	1.18E+00	3.32E+01	3.51E+02	3.71E+01	5.11E+01	3.90E+02	1.44E+02	1.82E+00	1.22E-04	1.24E+01	2.23E+00	4.12E+00		mg/kg	5.37E+04	1.54E+03
SO4-2	g/L	2.18E-03	2.11E-04	1.07E-03	6.25E-04	2.67E-04	2.83E-04	7.72E-04	1.85E-03	5.56E-05	4.82E-04	5.88E-05	6.12E-04		mg/kg	2.88E-01	2.28E-01
Sr+2	g/L	2.47E-01	2.44E-01	3.45E-02	8.37E-01	6.97E-01	4.77E-01	4.23E-01	3.58E-02	2.53E+00	1.01E+00	1.78E+00	1.34E+00		mg/kg	1.58E+02	5.00E+02
TOC	g/L	2.67E-04	4.76E-04	3.15E-04	0.00E+00	0.00E+00	2.91E-04	2.25E-04	1.27E-04	6.27E-04	9.04E-05	7.03E-08	2.11E-04		mg/kg	8.39E-02	7.88E-02
U(TOTAL)	g/L	1.53E+01	2.51E+02	3.92E+01	3.01E+01	3.32E-02	6.80E+00	5.71E+01	1.73E+01	1.98E+01	3.81E+00	7.11E+00	1.20E+01		mg/kg	2.13E+04	4.48E+03
Zr+4	g/L	1.71E+00	4.06E+00	6.28E+00	4.11E-01	1.82E+01	1.22E+01	7.15E+00	5.43E-01	7.80E-01	3.55E+00	1.03E+01	3.78E+00		mg/kg	2.67E+03	1.41E+03

assumes 3 kg/L for solids, 83 wt % solids and 1.1 kg/L liquids

~ 1.5 kg/L for bulk liquids, HTWOs resid. Multiplies liquid conc. by 5E-4.

Ref. RPP-17152, Hanford Tank waste Operations Simulator (HTWOS) Version 7.8 Model Design Document.

assume wtd avg of 2.68

HTWOS Residual Concentrations																	
Inventories divided by 360 ft3. Radionuclides decayed to 1/1/2020																	
	Volume														**Mass**		
Radionuclides		**A-101**	**A-102**	**A-103**	**A-104**	**A-105**	**A-106**	**Avg A-Farm**	**AX-101**	**AX-102**	**AX-103**	**AX-104**	**Avg AX-Farm**				
106Ru	Ci/L	2.19E-20	7.83E-21	9.46E-21	8.75E-20	4.02E-20	2.05E-18	3.69E-19	3.94E-20	2.27E-18	3.22E-20	2.00E-19	6.35E-19		µCi/g	7.64E-16	2.37E-16
113mCd	Ci/L	3.98E-04	9.55E-10	4.71E-04	4.50E-10	7.39E-11	8.47E-05	1.59E-04	4.06E-04	3.54E-10	5.59E-10	2.71E-05	1.08E-04		µCi/g	3.16E-02	4.04E-02
125Sb	Ci/L	3.41E-12	1.67E-12	1.92E-12	2.96E-10	1.60E-11	6.23E-11	6.35E-11	2.90E-12	8.07E-10	2.51E-11	1.05E-10	2.35E-10		µCi/g	2.32E-08	8.78E-08
126Sn	Ci/L	1.78E-10	1.54E-10	1.70E-10	8.47E-11	1.24E-11	6.67E-11	1.11E-10	1.50E-10	1.29E-10	7.34E-11	2.18E-11	9.36E-11		µCi/g	2.49E-08	3.49E-08
129I	Ci/L	1.10E-11	4.79E-12	7.45E-08	3.03E-12	5.13E-14	7.26E-12	1.24E-08	9.19E-12	2.02E-12	3.95E-12	9.02E-14	3.81E-12		µCi/g	2.71E-09	1.42E-09
134Cs	Ci/L	3.83E-14	2.40E-14	0.00E+00	3.62E-13	3.95E-14	5.53E-14	8.65E-14	3.02E-14	7.13E-15	2.07E-14	6.95E-14	3.19E-14		µCi/g	2.06E-11	1.19E-11
137Cs	Ci/L	9.86E-06	6.17E-06	6.95E-06	1.78E-05	2.25E-06	5.11E-06	8.03E-06	8.76E-06	2.04E-06	4.67E-06	8.46E-06	5.98E-06		µCi/g	1.91E-03	2.23E-03
137mBa	Ci/L	8.79E-06	5.50E-06	6.19E-06	1.59E-05	2.00E-06	4.55E-06	7.16E-06	7.80E-06	1.82E-06	4.16E-06	7.54E-06	5.33E-06		µCi/g	1.70E-03	1.99E-03
14C	Ci/L	3.08E-10	5.56E-11	1.63E-10	1.54E-10	1.49E-11	5.95E-11	1.26E-10	2.56E-10	7.97E-12	1.01E-10	2.63E-11	9.78E-11		µCi/g	2.22E-08	3.65E-08
151Sm	Ci/L	2.41E-01	6.37E-02	2.06E-01	8.02E-01	1.96E+00	4.46E+00	1.29E+00	3.31E-01	1.48E+00	4.45E-01	1.41E+00	9.17E-01		µCi/g	1.66E+03	3.42E+02
152Eu	Ci/L	5.03E-05	5.31E-06	1.73E-05	8.23E-05	8.55E-04	4.68E-04	2.46E-04	3.22E-05	4.09E-04	1.70E-04	6.15E-04	3.07E-04		µCi/g	1.75E-01	1.14E-01
154Eu	Ci/L	2.26E-03	2.32E-04	7.55E-04	7.39E-03	1.23E-02	2.05E-02	7.24E-03	1.40E-03	9.41E-03	1.25E-02	1.24E-02	8.94E-03		µCi/g	7.65E+00	3.34E+00
155Eu	Ci/L	3.46E-04	3.05E-05	1.01E-04	5.59E-04	7.30E-04	2.92E-03	7.82E-04	1.93E-04	1.45E-03	1.24E-03	2.22E-03	1.27E-03		µCi/g	1.09E+00	4.75E-01
226Ra	Ci/L	3.41E-15	2.16E-15	2.51E-15	8.03E-16	1.20E-16	1.18E-15	1.70E-15	2.84E-15	6.94E-16	1.19E-15	2.11E-16	1.23E-15		µCi/g	4.40E-13	4.61E-13
227Ac	Ci/L	3.47E-06	1.67E-06	4.63E-06	1.61E-09	1.28E-09	3.72E-07	1.69E-06	3.83E-06	7.95E-07	1.62E-06	9.19E-10	1.56E-06		µCi/g	1.39E-04	5.83E-04
228Ra	Ci/L	2.45E-07	1.18E-07	3.28E-07	6.07E-09	8.21E-14	3.05E-08	1.21E-07	2.71E-07	8.21E-06	4.51E-07	5.90E-14	2.23E-06		µCi/g	1.14E-05	8.34E-04
229Th	Ci/L	4.33E-10	2.08E-10	5.79E-10	1.52E-11	3.74E-13	5.70E-11	2.15E-10	4.77E-10	9.93E-11	2.03E-10	2.69E-13	1.95E-10		µCi/g	2.13E-08	7.28E-08
231Pa	Ci/L	1.18E-06	5.69E-07	1.58E-06	5.51E-10	4.37E-10	1.27E-07	5.77E-07	1.31E-06	2.72E-07	5.55E-07	3.14E-10	5.34E-07		µCi/g	4.74E-05	1.99E-04
232Th	Ci/L	1.57E-09	7.57E-10	2.10E-09	3.89E-11	5.26E-16	1.95E-10	7.77E-10	1.74E-09	5.26E-08	2.89E-09	3.78E-16	1.43E-08		µCi/g	7.29E-08	5.34E-06
232U	Ci/L	5.18E-07	8.81E-06	1.35E-06	6.24E-08	8.80E-13	9.17E-08	1.81E-06	4.14E-07	6.49E-07	2.16E-07	1.88E-10	3.20E-07		µCi/g	3.42E-05	1.19E-04
233U	Ci/L	3.77E-05	6.40E-04	9.78E-05	4.61E-06	1.92E-12	6.66E-06	1.31E-04	3.00E-05	4.72E-05	2.17E-06	4.11E-10	1.98E-05		µCi/g	2.48E-03	7.40E-03
234U	Ci/L	6.81E-06	1.12E-04	1.74E-05	1.21E-05	1.36E-08	2.87E-06	2.52E-05	7.51E-06	8.95E-06	2.47E-06	2.91E-06	5.46E-06		µCi/g	1.07E-03	2.04E-03
235U	Ci/L	2.76E-07	4.54E-06	7.08E-07	5.10E-07	5.69E-10	1.19E-07	1.03E-06	3.08E-07	3.64E-07	6.51E-08	1.22E-07	2.15E-07		µCi/g	4.45E-05	8.02E-05
236U	Ci/L	1.78E-07	2.93E-06	4.57E-07	2.91E-07	3.51E-10	7.37E-08	6.56E-07	1.97E-07	2.51E-07	8.70E-08	7.49E-08	1.52E-07		µCi/g	2.75E-05	5.69E-05
237Np	Ci/L	1.92E-05	6.92E-06	2.02E-05	1.20E-06	1.18E-06	3.52E-06	8.70E-06	2.10E-05	1.20E-05	1.05E-06	8.47E-07	8.71E-06		µCi/g	1.31E-03	3.25E-03
238Pu	Ci/L	4.44E-05	5.36E-04	1.43E-04	4.13E-04	3.57E-04	5.59E-04	3.42E-04	5.21E-05	5.49E-04	7.39E-05	5.75E-04	3.13E-04		µCi/g	2.09E-01	1.17E-01

Radionuclides		A-101	A-102	A-103	A-104	A-105	A-106	Avg A-Farm	AX-101	AX-102	AX-103	AX-104	Avg AX-Farm				
238U	Ci/L	6.13E-06	1.01E-04	1.57E-05	1.21E-05	1.33E-08	2.72E-06	2.29E-05	6.91E-06	7.93E-06	1.53E-06	2.85E-06	4.80E-06		µCi/g	1.02E-03	1.79E-03
239Pu	Ci/L	1.13E-03	1.48E-02	4.09E-03	1.41E-02	8.61E-03	1.63E-02	9.84E-03	1.43E-03	6.71E-03	1.79E-03	1.39E-02	5.95E-03		µCi/g	6.08E+00	2.22E+00
240Pu	Ci/L	2.71E-04	3.43E-03	9.37E-04	3.09E-03	2.11E-03	3.71E-03	2.26E-03	3.31E-04	2.15E-03	4.52E-04	3.40E-03	1.58E-03		µCi/g	1.38E+00	5.91E-01
241Am	Ci/L	5.32E-03	1.23E-02	3.30E-03	1.69E-02	8.55E-02	9.70E-03	2.22E-02	4.87E-03	9.33E-02	1.69E-02	4.85E-02	4.09E-02		µCi/g	3.62E+00	1.53E+01
241Pu	Ci/L	9.73E-04	1.24E-02	3.23E-03	7.99E-03	7.55E-03	1.21E-02	7.37E-03	1.15E-03	1.47E-02	1.57E-03	1.22E-02	7.40E-03		µCi/g	4.51E+00	2.76E+00
242Cm	Ci/L	1.22E-11	3.48E-11	5.38E-12	1.64E-10	1.14E-10	3.62E-11	6.10E-11	7.74E-12	2.90E-10	2.84E-11	1.55E-10	1.21E-10		µCi/g	1.35E-08	4.50E-08
242Pu	Ci/L	1.99E-08	2.57E-07	6.64E-08	1.54E-07	1.53E-07	2.46E-07	1.49E-07	2.36E-08	3.29E-07	3.18E-08	2.47E-07	1.58E-07		µCi/g	9.19E-05	5.89E-05
243Am	Ci/L	3.02E-06	6.74E-06	1.85E-06	8.37E-06	4.65E-05	4.80E-06	1.19E-05	3.02E-06	8.65E-05	9.24E-06	2.60E-05	3.12E-05		µCi/g	1.79E-03	1.16E-02
243Cm	Ci/L	5.56E-13	1.19E-12	1.86E-13	6.80E-12	5.83E-12	1.73E-12	2.72E-12	4.43E-13	2.56E-11	1.45E-12	7.99E-12	8.86E-12		µCi/g	6.45E-10	3.31E-09
244Cm	Ci/L	1.00E-11	2.22E-11	3.47E-12	1.23E-10	1.04E-10	3.19E-11	4.90E-11	8.19E-12	4.75E-10	2.57E-11	1.42E-10	1.63E-10		µCi/g	1.19E-08	6.07E-08
3H	Ci/L	3.76E-10	1.95E-10	2.36E-10	2.90E-10	2.04E-11	2.26E-10	2.24E-10	3.12E-10	9.06E-11	1.23E-10	3.59E-11	1.40E-10		µCi/g	8.43E-08	5.24E-08
59Ni	Ci/L	2.02E-04	7.22E-05	2.16E-04	2.05E-04	2.00E-04	1.77E-04	1.79E-04	2.12E-04	7.55E-05	1.20E-04	1.44E-04	1.38E-04		µCi/g	6.62E-02	5.14E-02
60Co	Ci/L	7.49E-05	1.06E-04	3.46E-05	3.37E-04	5.78E-04	9.48E-05	2.04E-04	6.81E-05	5.45E-04	2.03E-04	9.31E-04	4.37E-04		µCi/g	3.54E-02	1.63E-01
63Ni	Ci/L	1.68E-02	6.02E-03	1.80E-02	1.70E-02	1.68E-02	1.47E-02	1.49E-02	1.77E-02	6.33E-03	1.00E-02	1.21E-02	1.15E-02		µCi/g	5.49E+00	4.30E+00
79Se	Ci/L	6.99E-11	4.54E-11	5.25E-11	4.22E-11	6.14E-12	3.30E-11	4.15E-11	5.81E-11	4.26E-12	2.55E-11	1.08E-11	2.47E-11		µCi/g	1.23E-08	9.21E-09
90Sr	Ci/L	1.16E+00	2.49E+00	1.45E+00	3.24E+01	3.04E+01	5.25E+00	1.22E+01	1.74E+00	3.47E+00	7.16E+00	7.21E+01	2.11E+01		µCi/g	1.96E+03	7.88E+03
90Y	Ci/L	1.16E+00	2.49E+00	1.45E+00	3.24E+01	3.04E+01	5.25E+00	1.22E+01	1.74E+00	3.47E+00	7.16E+00	7.21E+01	2.11E+01		µCi/g	1.96E+03	7.88E+03
93mNb	Ci/L	3.54E-03	1.69E-03	4.70E-03	3.40E-04	5.08E-04	7.33E-04	1.92E-03	3.89E-03	8.52E-04	1.75E-03	3.65E-04	1.71E-03		µCi/g	2.73E-01	6.39E-01
93Zr	Ci/L	5.72E-04	2.73E-04	7.60E-04	5.50E-05	8.21E-05	1.18E-04	3.10E-04	6.28E-04	1.38E-04	2.82E-04	5.90E-05	2.77E-04		µCi/g	4.42E-02	1.03E-01
99Tc	Ci/L	1.08E-08	8.12E-09	9.25E-09	5.87E-09	8.54E-10	1.70E-08	8.65E-09	9.01E-09	7.58E-10	4.10E-09	5.07E-09	4.74E-09		µCi/g	6.36E-06	1.77E-06

A.4 ANCILLARY EQUIPMENT RESIDUAL WASTE INVENTORY ESTIMATES

Ancillary Equipment Residual Inventory Estimates												
Assumes 90% retrieval for catch tanks and vaults												
		Inventory	**A-Farm Inventory (kg)**									
Chemicals	**Ave Tank**	**Units**	**A-350**	**A-417**	**A-302A**	**A-302B**	**204-AR**	**244-A**	**244-AR**	**Total Tanks**	**Div Box/Pits**	**Pipelines**
	Conc. (g/L)	kL	0.04	0.42	0.23	2.31	0.27	1.97	1.08	6.32	0.039	23
Al	3.01E+02	kg	1.25E+01	1.25E+02	6.96E+01	6.96E+02	8.10E+01	5.93E+02	3.26E+02	1.90E+03	1.18E+01	6.93E+03
Bi+3	2.89E-01	kg	1.20E-02	1.20E-01	6.67E-02	6.67E-01	7.77E-02	5.69E-01	3.13E-01	1.83E+00	1.13E-02	6.65E+00
Ca+2	3.36E+01	kg	1.40E+00	1.40E+01	7.77E+00	7.77E+01	9.04E+00	6.62E+01	3.64E+01	2.13E+02	1.31E+00	7.74E+02
Cl-	2.74E-04	kg	1.14E-05	1.14E-04	6.33E-05	6.33E-04	7.36E-05	5.39E-04	2.97E-04	1.73E-03	1.07E-05	6.30E-03
TIC as CO3	5.52E-01	kg	2.30E-02	2.30E-01	1.27E-01	1.27E+00	1.48E-01	1.09E+00	5.98E-01	3.49E+00	2.15E-02	1.27E+01
Cr	3.60E+01	kg	1.50E+00	1.50E+01	8.32E+00	8.32E+01	9.68E+00	7.09E+01	3.90E+01	2.28E+02	1.41E+00	8.29E+02
F-	1.80E-05	kg	7.50E-07	7.50E-06	4.16E-06	4.16E-05	4.84E-06	3.54E-05	1.95E-05	1.14E-04	7.02E-07	4.14E-04
Fe+3	2.28E+02	kg	9.50E+00	9.50E+01	5.27E+01	5.27E+02	6.13E+01	4.49E+02	2.47E+02	1.44E+03	8.90E+00	5.25E+03
Hg+2	7.74E-06	kg	3.22E-07	3.22E-06	1.79E-06	1.79E-05	2.08E-06	1.52E-05	8.38E-06	4.89E-05	3.02E-07	1.78E-04
K+	1.36E-04	kg	5.66E-06	5.66E-05	3.14E-05	3.14E-04	3.65E-05	2.68E-04	1.47E-04	8.59E-04	5.30E-06	3.13E-03
La+3	1.50E+00	kg	6.25E-02	6.25E-01	3.47E-01	3.47E+00	4.03E-01	2.95E+00	1.63E+00	9.48E+00	5.86E-02	3.45E+01
Mn	2.03E+01	kg	8.46E-01	8.46E+00	4.69E+00	4.69E+01	5.46E+00	4.00E+01	2.20E+01	1.28E+02	7.93E-01	4.67E+02
Na+	4.48E+01	kg	1.86E+00	1.86E+01	1.03E+01	1.03E+02	1.20E+01	8.81E+01	4.85E+01	2.83E+02	1.75E+00	1.03E+03
Ni+2	1.70E+01	kg	7.09E-01	7.09E+00	3.93E+00	3.93E+01	4.57E+00	3.35E+01	1.84E+01	1.08E+02	6.64E-01	3.92E+02
NO2-	4.22E-03	kg	1.76E-04	1.76E-03	9.74E-04	9.74E-03	1.13E-03	8.31E-03	4.57E-03	2.67E-02	1.65E-04	9.71E-02
NO3-	5.22E-03	kg	2.17E-04	2.17E-03	1.20E-03	1.20E-02	1.40E-03	1.03E-02	5.65E-03	3.29E-02	2.03E-04	1.20E-01
Pb+2	4.42E-05	kg	1.84E-06	1.84E-05	1.02E-05	1.02E-04	1.19E-05	8.69E-05	4.78E-05	2.79E-04	1.72E-06	1.02E-03
PO4-3	9.47E-04	kg	3.94E-05	3.94E-04	2.19E-04	2.19E-03	2.54E-04	1.86E-03	1.03E-03	5.98E-03	3.69E-05	2.18E-02
Si+4	1.44E+02	kg	5.99E+00	5.99E+01	3.32E+01	3.32E+02	3.86E+01	2.83E+02	1.56E+02	9.08E+02	5.61E+00	3.31E+03
SO4-2	7.72E-04	kg	3.21E-05	3.21E-04	1.78E-04	1.78E-03	2.07E-04	1.52E-03	8.36E-04	4.88E-03	3.01E-05	1.78E-02
Sr+2	4.23E-01	kg	1.76E-02	1.76E-01	9.76E-02	9.76E-01	1.14E-01	8.32E-01	4.58E-01	2.67E+00	1.65E-02	9.72E+00
TOC	2.25E-04	kg	9.36E-06	9.36E-05	5.19E-05	5.19E-04	6.04E-05	4.42E-04	2.43E-04	1.42E-03	8.77E-06	5.17E-03
U(TOTAL)	5.71E+01	kg	2.38E+00	2.38E+01	1.32E+01	1.32E+02	1.53E+01	1.12E+02	6.18E+01	3.61E+02	2.23E+00	1.31E+03
Zr+4	7.15E+00	kg	2.98E-01	2.98E+00	1.65E+00	1.65E+01	1.92E+00	1.41E+01	7.74E+00	4.52E+01	2.79E-01	1.64E+02
Sum			3.71E+01	3.71E+02	2.06E+02	2.06E+03	2.40E+02	1.76E+03	9.66E+02	5.64E+03	3.48E+01	2.05E+04
	Ave Tank											
Radionuclides	**Conc. (Ci/L)**		**A-350**	**A-417**	**A-302A**	**A-302B**	**204-AR**	**244-A**	**244-AR**	**Total Tanks**	**Div Bix**	**Pipelines**
106Ru	3.69E-19	Ci	1.54E-17	1.54E-16	8.52E-17	8.52E-16	9.92E-17	7.26E-16	3.99E-16	2.33E-15	1.44E-17	8.49E-15
113mCd	1.59E-04	Ci	6.62E-03	6.62E-02	3.67E-02	3.67E-01	4.27E-02	3.13E-01	1.72E-01	1.00E+00	6.20E-03	3.66E+00
125Sb	6.35E-11	Ci	2.64E-09	2.64E-08	1.47E-08	1.47E-07	1.71E-08	1.25E-07	6.88E-08	4.01E-07	2.48E-09	1.46E-06
126Sn	1.11E-10	Ci	4.63E-09	4.63E-08	2.57E-08	2.57E-07	2.99E-08	2.19E-07	1.20E-07	7.02E-07	4.33E-09	2.56E-06
129I	1.24E-08	Ci	5.17E-07	5.17E-06	2.87E-06	2.87E-05	3.34E-06	2.44E-05	1.34E-05	7.84E-05	4.84E-07	2.86E-04
134Cs	8.65E-14	Ci	3.60E-12	3.60E-11	2.00E-11	2.00E-10	2.32E-11	1.70E-10	9.36E-11	5.46E-10	3.37E-12	1.99E-09
137Cs	8.03E-06	Ci	3.34E-04	3.34E-03	1.85E-03	1.85E-02	2.16E-03	1.58E-02	8.69E-03	5.07E-02	3.13E-04	1.85E-01
137mBa	7.16E-06	Ci	2.98E-04	2.98E-03	1.65E-03	1.65E-02	1.92E-03	1.41E-02	7.75E-03	4.52E-02	2.79E-04	1.65E-01

	Ave Tank	Inventory										
Radionuclides	**Conc. (Ci/L)**	**Units**	**A-350**	**A-417**	**A-302A**	**A-302B**	**204-AR**	**244-A**	**244-AR**	**Total Tanks**	**Div Bix**	**Pipelines**
14C	1.26E-10	Ci	5.24E-09	5.24E-08	2.91E-08	2.91E-07	3.38E-08	2.48E-07	1.36E-07	7.95E-07	4.91E-09	2.90E-06
151Sm	1.29E+00	Ci	5.36E+01	5.36E+02	2.97E+02	2.97E+03	3.46E+02	2.54E+03	1.39E+03	8.14E+03	5.02E+01	2.96E+04
152Eu	2.46E-04	Ci	1.03E-02	1.03E-01	5.69E-02	5.69E-01	6.62E-02	4.85E-01	2.67E-01	1.56E+00	9.61E-03	5.67E+00
154Eu	7.24E-03	Ci	3.02E-01	3.02E+00	1.67E+00	1.67E+01	1.95E+00	1.43E+01	7.84E+00	4.58E+01	2.82E-01	1.67E+02
155Eu	7.82E-04	Ci	3.25E-02	3.25E-01	1.80E-01	1.80E+00	2.10E-01	1.54E+00	8.46E-01	4.94E+00	3.05E-02	1.80E+01
226Ra	1.70E-15	Ci	7.06E-14	7.06E-13	3.92E-13	3.92E-12	4.56E-13	3.34E-12	1.84E-12	1.07E-11	6.62E-14	3.90E-11
227Ac	1.69E-06	Ci	7.03E-05	7.03E-04	3.90E-04	3.90E-03	4.54E-04	3.32E-03	1.83E-03	1.07E-02	6.59E-05	3.88E-02
228Ra	1.21E-07	Ci	5.05E-06	5.05E-05	2.80E-05	2.80E-04	3.26E-05	2.39E-04	1.31E-04	7.66E-04	4.73E-06	2.79E-03
229Th	2.15E-10	Ci	8.97E-09	8.97E-08	4.97E-08	4.97E-07	5.79E-08	4.24E-07	2.33E-07	1.36E-06	8.40E-09	4.95E-06
231Pa	5.77E-07	Ci	2.40E-05	2.40E-04	1.33E-04	1.33E-03	1.55E-04	1.14E-03	6.25E-04	3.65E-03	2.25E-05	1.33E-02
232Th	7.77E-10	Ci	3.23E-08	3.23E-07	1.79E-07	1.79E-06	2.09E-07	1.53E-06	8.41E-07	4.91E-06	3.03E-08	1.79E-05
232U	1.81E-06	Ci	7.52E-05	7.52E-04	4.17E-04	4.17E-03	4.85E-04	3.55E-03	1.95E-03	1.14E-02	7.04E-05	4.15E-02
233U	1.31E-04	Ci	5.46E-03	5.46E-02	3.03E-02	3.03E-01	3.53E-02	2.58E-01	1.42E-01	8.29E-01	5.12E-03	3.02E+00
234U	2.52E-05	Ci	1.05E-03	1.05E-02	5.82E-03	5.82E-02	6.77E-03	4.96E-02	2.73E-02	1.59E-01	9.83E-04	5.80E-01
235U	1.03E-06	Ci	4.27E-05	4.27E-04	2.37E-04	2.37E-03	2.76E-04	2.02E-03	1.11E-03	6.48E-03	4.00E-05	2.36E-02
236U	6.56E-07	Ci	2.73E-05	2.73E-04	1.51E-04	1.51E-03	1.76E-04	1.29E-03	7.10E-04	4.14E-03	2.56E-05	1.51E-02
237Np	8.70E-06	Ci	3.62E-04	3.62E-03	2.01E-03	2.01E-02	2.34E-03	1.71E-02	9.42E-03	5.50E-02	3.39E-04	2.00E-01
238Pu	3.42E-04	Ci	1.42E-02	1.42E-01	7.90E-02	7.90E-01	9.20E-02	6.74E-01	3.70E-01	2.16E+00	1.33E-02	7.87E+00
238U	2.29E-05	Ci	9.52E-04	9.52E-03	5.28E-03	5.28E-02	6.14E-03	4.50E-02	2.47E-02	1.44E-01	8.91E-04	5.26E-01
239Pu	9.84E-03	Ci	4.10E-01	4.10E+00	2.27E+00	2.27E+01	2.64E+00	1.94E+01	1.07E+01	6.22E+01	3.84E-01	2.26E+02
240Pu	2.26E-03	Ci	9.40E-02	9.40E-01	5.21E-01	5.21E+00	6.07E-01	4.44E+00	2.44E+00	1.43E+01	8.80E-02	5.19E+01
241Am	2.22E-02	Ci	9.23E-01	9.23E+00	5.12E+00	5.12E+01	5.96E+00	4.36E+01	2.40E+01	1.40E+02	8.64E-01	5.10E+02
241Pu	7.37E-03	Ci	3.07E-01	3.07E+00	1.70E+00	1.70E+01	1.98E+00	1.45E+01	7.97E+00	4.65E+01	2.87E-01	1.69E+02
242Cm	6.10E-11	Ci	2.54E-09	2.54E-08	1.41E-08	1.41E-07	1.64E-08	1.20E-07	6.60E-08	3.85E-07	2.38E-09	1.40E-06
242Pu	1.49E-07	Ci	6.22E-06	6.22E-05	3.45E-05	3.45E-04	4.02E-05	2.94E-04	1.62E-04	9.44E-04	5.83E-06	3.44E-03
243Am	1.19E-05	Ci	4.95E-04	4.95E-03	2.74E-03	2.74E-02	3.19E-03	2.34E-02	1.29E-02	7.51E-02	4.63E-04	2.73E-01
243Cm	2.72E-12	Ci	1.13E-10	1.13E-09	6.27E-10	6.27E-09	7.30E-10	5.35E-09	2.94E-09	1.72E-08	1.06E-10	6.25E-08
244Cm	4.90E-11	Ci	2.04E-09	2.04E-08	1.13E-08	1.13E-07	1.32E-08	9.65E-08	5.31E-08	3.10E-07	1.91E-09	1.13E-06
3H	2.24E-10	Ci	9.32E-09	9.32E-08	5.17E-08	5.17E-07	6.02E-08	4.41E-07	2.42E-07	1.41E-06	8.73E-09	5.15E-06
59Ni	1.79E-04	Ci	7.44E-03	7.44E-02	4.13E-02	4.13E-01	4.80E-02	3.52E-01	1.93E-01	1.13E+00	6.97E-03	4.11E+00
60Co	2.04E-04	Ci	8.50E-03	8.50E-02	4.71E-02	4.71E-01	5.49E-02	4.02E-01	2.21E-01	1.29E+00	7.96E-03	4.69E+00
63Ni	1.49E-02	Ci	6.20E-01	6.20E+00	3.44E+00	3.44E+01	4.00E+00	2.93E+01	1.61E+01	9.41E+01	5.81E-01	3.43E+02
79Se	4.15E-11	Ci	1.73E-09	1.73E-08	9.58E-09	9.58E-08	1.12E-08	8.17E-08	4.49E-08	2.62E-07	1.62E-09	9.55E-07
90Sr	1.22E+01	Ci	5.08E+02	5.08E+03	2.81E+03	2.81E+04	3.28E+03	2.40E+04	1.32E+04	7.70E+04	4.75E+02	2.80E+05
90Y	1.22E+01	Ci	5.08E+02	5.08E+03	2.81E+03	2.81E+04	3.28E+03	2.40E+04	1.32E+04	7.70E+04	4.75E+02	2.80E+05
93mNb	1.92E-03	Ci	7.99E-02	7.99E-01	4.43E-01	4.43E+00	5.16E-01	3.78E+00	2.08E+00	1.21E+01	7.48E-02	4.41E+01
93Zr	3.10E-04	Ci	1.29E-02	1.29E-01	7.16E-02	7.16E-01	8.33E-02	6.10E-01	3.36E-01	1.96E+00	1.21E-02	7.13E+00
99Tc	8.65E-09	Ci	3.60E-07	3.60E-06	2.00E-06	2.00E-05	2.33E-06	1.70E-05	9.37E-06	5.47E-05	3.38E-07	1.99E-04
Sum			1.07E+03	1.07E+04	5.94E+03	5.94E+04	6.92E+03	5.07E+04	2.79E+04	1.63E+05	1.00E+03	5.92E+05

Ancillary Equipment Residual Inventory Estimates								
Assumes 90% retrieval for catch tanks and vaults								
		Inventory	**AX-Farm Inventory (kg)**					
Chemicals	**Ave Tank**	**Units**	**AX-151**	**AX-152**	**AX-152/DS**	**Total tanks**	**Div Box/Pits**	**Pipelines**
	Conc. (kg/L)	kL	1.06	0.038	0.08	1.1737	0.029	19
Al	2.67E+02	kg	2.83E+02	1.01E+01	2.02E+01	3.13E+02	7.74E+00	5.07E+03
Bi+3	5.75E-07	kg	6.10E-07	2.19E-08	4.35E-08	6.75E-07	1.67E-08	1.09E-05
Ca+2	1.58E+01	kg	1.67E+01	5.99E-01	1.19E+00	1.85E+01	4.57E-01	2.99E+02
Cl-	1.18E-04	kg	1.25E-04	4.50E-06	8.96E-06	1.39E-04	3.43E-06	2.25E-03
TIC as CO3	1.15E+00	kg	1.22E+00	4.36E-02	8.68E-02	1.35E+00	3.33E-02	2.18E+01
Cr	2.53E+01	kg	2.68E+01	9.62E-01	1.92E+00	2.97E+01	7.34E-01	4.81E+02
F-	2.26E-05	kg	2.39E-05	8.58E-07	1.71E-06	2.65E-05	6.55E-07	4.29E-04
Fe+3	2.76E+02	kg	2.93E+02	1.05E+01	2.09E+01	3.24E+02	8.02E+00	5.25E+03
Hg+2	9.20E-07	kg	9.75E-07	3.49E-08	6.96E-08	1.08E-06	2.67E-08	1.75E-05
K+	8.96E-05	kg	9.50E-05	3.41E-06	6.78E-06	1.05E-04	2.60E-06	1.70E-03
La+3	1.36E+00	kg	1.44E+00	5.16E-02	1.03E-01	1.59E+00	3.94E-02	2.58E+01
Mn	1.06E+01	kg	1.12E+01	4.01E-01	7.99E-01	1.24E+01	3.06E-01	2.01E+02
Na+	1.46E+02	kg	1.55E+02	5.57E+00	1.11E+01	1.72E+02	4.25E+00	2.78E+03
Ni+2	1.33E+01	kg	1.41E+01	5.06E-01	1.01E+00	1.56E+01	3.86E-01	2.53E+02
NO2-	2.26E-03	kg	2.40E-03	8.59E-05	1.71E-04	2.65E-03	6.55E-05	4.29E-02
NO3-	4.51E-03	kg	4.78E-03	1.71E-04	3.42E-04	5.30E-03	1.31E-04	8.57E-02
Pb+2	4.93E-05	kg	5.23E-05	1.87E-06	3.73E-06	5.79E-05	1.43E-06	9.37E-04

		Inventory	AX-Farm Inventory (kg)					
Chemicals	**Ave Tank**	**Units**	**AX-151**	**AX-152**	**AX-152/DS**	**Total tanks**	**Div Box/Pits**	**Pipelines**
PO4-3	1.62E-04	kg	1.72E-04	6.17E-06	1.23E-05	1.91E-04	4.71E-06	3.08E-03
Si+4	4.12E+00	kg	4.37E+00	1.57E-01	3.12E-01	4.84E+00	1.19E-01	7.83E+01
SO4-2	6.12E-04	kg	6.49E-04	2.33E-05	4.63E-05	7.18E-04	1.77E-05	1.16E-02
Sr+2	1.34E+00	kg	1.42E+00	5.09E-02	1.01E-01	1.57E+00	3.89E-02	2.55E+01
TOC	2.11E-04	kg	2.24E-04	8.03E-06	1.60E-05	2.48E-04	6.12E-06	4.01E-03
U(TOTAL)	1.20E+01	kg	1.27E+01	4.56E-01	9.08E-01	1.41E+01	3.48E-01	2.28E+02
Zr+4	3.78E+00	kg	4.01E+00	1.44E-01	2.86E-01	4.44E+00	1.10E-01	7.19E+01
Sum			8.25E+02	2.96E+01	5.89E+01	9.14E+02	2.26E+01	1.48E+04
	Ave Tank	**Inventory**	**AX-Farm Inventory (Ci)**					
Radionuclides	**Conc. (kg/L)**	**Units**	**AX-151**	**AX-152**	**AX-152/DS**	**Total tanks**	**Div Box/Pits**	**Pipelines**
106Ru	6.35E-19	Ci	6.74E-16	2.41E-17	4.81E-17	7.46E-16	1.84E-17	1.21E-14
113mCd	1.08E-04	Ci	1.15E-01	4.11E-03	8.19E-03	1.27E-01	3.14E-03	2.06E+00
125Sb	2.35E-10	Ci	2.49E-07	8.94E-09	1.78E-08	2.76E-07	6.82E-09	4.47E-06
126Sn	9.36E-11	Ci	9.92E-08	3.56E-09	7.09E-09	1.10E-07	2.71E-09	1.78E-06
129I	3.81E-12	Ci	4.04E-09	1.45E-10	2.89E-10	4.48E-09	1.11E-10	7.25E-08
134Cs	3.19E-14	Ci	3.38E-11	1.21E-12	2.41E-12	3.74E-11	9.24E-13	6.05E-10
137Cs	5.98E-06	Ci	6.34E-03	2.27E-04	4.53E-04	7.02E-03	1.73E-04	1.14E-01
137mBa	5.33E-06	Ci	5.65E-03	2.02E-04	4.03E-04	6.25E-03	1.55E-04	1.01E-01
14C	9.78E-11	Ci	1.04E-07	3.71E-09	7.40E-09	1.15E-07	2.83E-09	1.86E-06
151Sm	9.17E-01	Ci	9.72E+02	3.49E+01	6.94E+01	1.08E+03	2.66E+01	1.74E+04

	Ave Tank	Inventory	AX-Farm Inventory (Ci)					
Radionuclides	**Conc. (kg/L)**	**Units**	**AX-151**	**AX-152**	**AX-152/DS**	**Total tanks**	**Div Box/Pits**	**Pipelines**
152Eu	3.07E-04	Ci	3.25E-01	1.17E-02	2.32E-02	3.60E-01	8.89E-03	5.83E+00
154Eu	8.94E-03	Ci	9.48E+00	3.40E-01	6.77E-01	1.05E+01	2.59E-01	1.70E+02
155Eu	1.27E-03	Ci	1.35E+00	4.84E-02	9.63E-02	1.49E+00	3.69E-02	2.42E+01
226Ra	1.23E-15	Ci	1.31E-12	4.69E-14	9.34E-14	1.45E-12	3.58E-14	2.34E-11
227Ac	1.56E-06	Ci	1.66E-03	5.93E-05	1.18E-04	1.83E-03	4.53E-05	2.97E-02
228Ra	2.23E-06	Ci	2.37E-03	8.49E-05	1.69E-04	2.62E-03	6.48E-05	4.24E-02
229Th	1.95E-10	Ci	2.07E-07	7.41E-09	1.48E-08	2.29E-07	5.65E-09	3.70E-06
231Pa	5.34E-07	Ci	5.66E-04	2.03E-05	4.04E-05	6.26E-04	1.55E-05	1.01E-02
232Th	1.43E-08	Ci	1.52E-05	5.44E-07	1.08E-06	1.68E-05	4.15E-07	2.72E-04
232U	3.20E-07	Ci	3.39E-04	1.21E-05	2.42E-05	3.75E-04	9.27E-06	6.07E-03
233U	1.98E-05	Ci	2.10E-02	7.54E-04	1.50E-03	2.33E-02	5.75E-04	3.77E-01
234U	5.46E-06	Ci	5.79E-03	2.07E-04	4.13E-04	6.41E-03	1.58E-04	1.04E-01
235U	2.15E-07	Ci	2.28E-04	8.17E-06	1.63E-05	2.52E-04	6.23E-06	4.08E-03
236U	1.52E-07	Ci	1.62E-04	5.79E-06	1.15E-05	1.79E-04	4.42E-06	2.90E-03
237Np	8.71E-06	Ci	9.23E-03	3.31E-04	6.59E-04	1.02E-02	2.53E-04	1.66E-01
238Pu	3.13E-04	Ci	3.31E-01	1.19E-02	2.37E-02	3.67E-01	9.06E-03	5.94E+00
238U	4.80E-06	Ci	5.09E-03	1.83E-04	3.64E-04	5.64E-03	1.39E-04	9.13E-02
239Pu	5.95E-03	Ci	6.31E+00	2.26E-01	4.51E-01	6.99E+00	1.73E-01	1.13E+02
240Pu	1.58E-03	Ci	1.68E+00	6.02E-02	1.20E-01	1.86E+00	4.59E-02	3.01E+01
241Am	4.09E-02	Ci	4.34E+01	1.55E+00	3.10E+00	4.80E+01	1.19E+00	7.77E+02

	Ave Tank	Inventory	AX-Farm Inventory (Ci)					
Radionuclides	**Conc. (kg/L)**	**Units**	**AX-151**	**AX-152**	**AX-152/DS**	**Total tanks**	**Div Box/Pits**	**Pipelines**
241Pu	7.40E-03	Ci	7.85E+00	2.81E-01	5.61E-01	8.69E+00	2.15E-01	1.41E+02
242Cm	1.21E-10	Ci	1.28E-07	4.58E-09	9.12E-09	1.41E-07	3.50E-09	2.29E-06
242Pu	1.58E-07	Ci	1.67E-04	5.99E-06	1.19E-05	1.85E-04	4.57E-06	3.00E-03
243Am	3.12E-05	Ci	3.31E-02	1.19E-03	2.36E-03	3.66E-02	9.04E-04	5.93E-01
243Cm	8.86E-12	Ci	9.39E-09	3.37E-10	6.71E-10	1.04E-08	2.57E-10	1.68E-07
244Cm	1.63E-10	Ci	1.73E-07	6.19E-09	1.23E-08	1.91E-07	4.72E-09	3.09E-06
3H	1.40E-10	Ci	1.49E-07	5.33E-09	1.06E-08	1.65E-07	4.07E-09	2.67E-06
59Ni	1.38E-04	Ci	1.46E-01	5.23E-03	1.04E-02	1.62E-01	3.99E-03	2.62E+00
60Co	4.37E-04	Ci	4.63E-01	1.66E-02	3.31E-02	5.13E-01	1.27E-02	8.30E+00
63Ni	1.15E-02	Ci	1.22E+01	4.38E-01	8.72E-01	1.35E+01	3.34E-01	2.19E+02
79Se	2.47E-11	Ci	2.62E-08	9.38E-10	1.87E-09	2.90E-08	7.16E-10	4.69E-07
90Sr	2.11E+01	Ci	2.24E+04	8.02E+02	1.60E+03	2.48E+04	6.12E+02	4.01E+05
90Y	2.11E+01	Ci	2.24E+04	8.02E+02	1.60E+03	2.48E+04	6.12E+02	4.01E+05
93mNb	1.71E-03	Ci	1.81E+00	6.51E-02	1.30E-01	2.01E+00	4.97E-02	3.25E+01
93Zr	2.77E-04	Ci	2.93E-01	1.05E-02	2.09E-02	3.25E-01	8.02E-03	5.26E+00
99Tc	4.74E-09	Ci	5.02E-06	1.80E-07	3.58E-07	5.56E-06	1.37E-07	9.00E-05
Sum	4.32E+01		4.58E+04	1.64E+03	3.27E+03	5.07E+04	1.25E+03	8.21E+05