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ENGINEERING CHANGE NOTICE Page 1 of 2	1. ECN 643816 Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Jim G. Field, Data Assessment and Interpretation, R2-12, 376-3756	[] Yes [X] No	07/30/98
	6. Project Title/No./Work Order No. Tank 241-AW-105	7. Bldg./Sys./Fac. No. 241-AW-105	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-WM-ER-364, Rev. 1-A	10. Related ECN No(s). ECNs: 635466, 635524	11. Related PO No. N/A

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13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

The document has been totally revised to include the results of recent sampling to address technical issues associated with the waste, and to update the best basis standard inventory.

SEP 1998 RECEIVED EDMC

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Changes required to incorporate new sampling data.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution.

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16. Design Verification Required	17. Cost Impact						18. Schedule Impact (days)	
	ENGINEERING			CONSTRUCTION				
[] Yes	Additional	[]	$	Additional	[]	$	Improvement	[]
[X] No	Savings	[]	$	Savings	[]	$	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

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Design Authority			Design Agent		
Cog. Eng. J.G. Field	J G Field	8/27/98	PE		
Cog. Mgr. K.M. Hall	[signature]	8/28/98	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other J.W. Cammann	JW Cammann	8/28/98	Other		
R.J. Cash	R J Cash	8/31/98	DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
J.G. Kristofzski	NWKirch for	8/28/98	ADDITIONAL		

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Tank Characterization Report for Double-Shell Tank 241-AW-105

Jim G. Field
Lockheed Martin Hanford Corp., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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Abstract: This document summarizes the information on the historical uses, present status, and the sampling and analysis results of waste stored in Tank 241-AW-105. This report supports the requirements of the Tri-Party Agreement Milestone M-44-15B.

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Revision 2

Tank Characterization Report for Double-Shell Tank 241-AW-105

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LIST OF TERMS

AEA	alpha energy analysis
ANOVA	analysis of variance
Btu/hr	British thermal units per hour
Ci/L	curies per liter
Ci	curie
CI	confidence interval
cm	centimeter
CWZr2	zirconium cladding, coating waste
DQO	data quality objective
DSC	differential scanning calorimetry
dyne/cm	dynes per centimeter
ft	feet
g	gram
g/L	grams per liter
g/cm^3	grams per cubic centimeter
g/mL	grams per milliliter
GEA	gamma energy analysis
HDW	Hanford defined waste
IC	ion chromatography
ICP	inductively coupled plasma spectroscopy
in.	inch
J/g	joules per gram
kg	kilogram
kgal	kilogallon
kL	kiloliter
kW	kilowatt
lb	pound
LFL	lower flammability limit
m	meter
M	moles per liter
mg	milligram
mL	milliliter
mrad/hr	millirads per hour
n/a	not applicable
NA	not analyzed
N/A	not available
n/d	not detected
n/r	not reported
NR	not requested
nCi/g	nanocuries per gram
NCRW	neutralized cladding removal waste

LIST OF TERMS (Continued)

Pa	Pascal
PCBs	polychlorinated biphenyls
PHMC	Project Hanford Management Contractor
ppm	parts per million
ppmv	parts per million by volume
PUREX	plutonium-uranium extraction (plant)
PXMSC	PUREX miscellaneous waste
QC	quality control
REML	restricted maximum likelihood estimation
RPD	relative percent difference
SAP	sampling and analysis plan
SMM	supernatant mixing model
SMMA2	242-A Evaporator salt slurry
TGA	thermogravimetric analysis
TIC	total inorganic carbon
TLM	tank layer model
TOC	total organic carbon
TWRS	Tank Waste Remediation System
vol%	volume percent
W	watt
WSTRS	Waste Status and Transaction Record Summary
wt%	weight percent
°C	degrees Celsius
°F	degrees Fahrenheit
%	percent
μCi/L	microcuries per liter
μCi/g	microcuries per gram
μCi/mL	microcuries per milliliter
μeq/g	microequivalents per gram
μg C/g	micrograms of carbon per gram
μg C/mL	micrograms carbon per gram
μg/g	micrograms per gram
μm	micrometer
μg/mL	micrograms per milliliter

1.0 INTRODUCTION

A major function of the Tank Waste Remediation System (TWRS) is to characterize waste in support of waste management and disposal activities at the Hanford Site. Analytical data from sampling and analysis and other available information about a tank are compiled and maintained in a tank characterization report. This report and its appendices serve as the tank characterization report for double-shell tank 241-AW-105.

The objectives of this report are 1) to use characterization data in response to technical issues associated with tank 241-AW-105 waste and 2) to provide a standard characterization of this waste in terms of a best-basis inventory estimate. Section 2.0 summarizes the response to technical issues, Section 3.0 shows the best-basis inventory estimate, and Section 4.0 makes recommendations about the tank's safety status and additional sampling needs. The appendices contain supporting data and information. This report supports the requirements of *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1997), Milestone M-44-15b, change request M-44-97-03 to "issue characterization deliverables consistent with the Waste Information Requirements Documents developed for 1998."

1.1 SCOPE

The characterization information in this report originated from sample analyses and known historical sources. The results of recent sample events will be used to fulfill the requirements of the data quality objectives (DQOs) and memoranda of understanding specified in Brown et al. (1997) for this tank. Other information can be used to support conclusions derived from these results.

Appendix A contains historical information for tank 241-AW-105 including surveillance information, records pertaining to waste transfers and tank operations, and expected tank contents derived from a process knowledge model. Appendix B summarizes recent sampling events (see Table 1-1), sample data obtained before 1989, and sampling results. Appendix C reports the statistical analysis and numerical manipulation of data used in issue resolution. Appendix D contains the evaluation to establish the best basis for the inventory estimate in this tank. Appendix E is a bibliography that resulted from an in-depth literature search of all known information sources applicable to tank 241-AW-105 and its respective waste types. The reports listed in Appendix E are available in the Lockheed Martin Hanford Corporation Tank Characterization and Safety Resource Center.

Table 1-1. Summary of Recent Sampling.

Sample/Date[1]	Phase	Location	Segmentation	% Recovery
Combustible gas test (8/20/96)	Gas	Riser 10A: tank headspace, breather vent, breathing zone, and sample riser	n/a	n/a
Combustible gas test (8/20/96)	Gas	Riser 15A: tank headspace, breather vent, breathing zone, and sample riser	n/a	n/a
Grab samples 5AW-96-1 5AW-96-2 5AW-96-4 (8/20/96)	Liquid	Riser 10A: 394 cm (155 in.), 348 cm (137 in.), and 300 cm (118 in.) from tank bottom	None	100%
Grab samples 5AW-96-5 5AW-96-7 5AW-96-9 (8/20/96)	Solid	Riser 10A: 241 cm (95 in.), 198 cm (78 in.), and 196 cm (77 in.) from tank bottom	None	100%
Grab samples 5AW-96-10 5AW-96-11 5AW-96-14 (8/21/96)	Liquid	Riser 15A: 394 cm (155 in.), 348 cm (137 in.), and 300 cm (118 in.) from tank bottom	None	100%
Grab samples 5AW-96-15 5AW-96-17 5AW-96-20 (8/21/96)	Solid	Riser 15A: 241 cm (95 in.), 185 cm (73 in.), and 168 cm (66 in.) from tank bottom	None	100%
Combustible gas test (5/09/97) and (5/13/97)	Gas	Riser 15A: tank headspace, 6.1 m (20 ft) below top of riser	n/a	n/a
Push core 195 (5/09/97)	Solid	Riser 10A	6 segments, upper half and lower half	84% to 100%
Push core 196 (5/14/97)	Solid	Riser 12A	6 segments, upper half and lower half	78% to 100%

Notes:

n/a = not applicable

[1]Dates are in the mm/dd/yy format.

1.2 TANK BACKGROUND

Tank 241-AW-105 is located in the 200 East Area AW Tank Farm on the Hanford Site. The tank went into service in 1980 when it received flush water. From 1980 to 1984, the tank received waste from tanks 241-A-102, 241-AW-104, and 241-AW-103, and it transferred waste to tanks 241-AW-101, 241-AZ-101, and 241-AN-101.

Flush water from miscellaneous sources was received from 1982 to 1996. Noncomplexed low-level waste from B Plant was received in 1984. PUREX dilute noncomplexed waste was received from 1983 to 1984 and 1992 to 1996, and PUREX sludge and supernatant decladding waste (neutralized cladding removal waste [NCRW]) was received from 1984 to 1988. Salt well liquor from various single-shell tanks was received in 1988. PUREX spent metathesis process waste was received between 1988 and 1990.

Waste was transferred between tanks 241-AW-102 and 241-AW-105 in support of the 242-A Evaporator from 1983 to 1988. From 1994 to 1995, dilute noncomplexed waste was transferred to tanks 241-AP-108 and 241-AP-104 (Agnew et al. 1997b).

A summary description of tank 241-AW-105 is given in Table 1-2. The tank has a design capacity of 4,390 kL (1,160 kgal), and, as of April 30, 1998, contained an estimated 1,640 kL (434 kgal) of dilute noncomplexed and NCRW waste (Hanlon 1998). The tank is not on any Watch List (Public Law 101-510).

Table 1-2. Description of Tank 241-AW-105.

TANK DESCRIPTION[1]	
Type	Double-shell
Constructed	1978 to 1980
In service	1980
Diameter	22.9 m (75 ft)
Operating depth	10.7 m (35.2 ft)
Capacity	4,390 kL (1,160 kgal)
Bottom shape	Flat
Ventilation	Active
TANK STATUS	
Waste classification	Dilute noncomplexed and NCRW
Total waste volume[2]	1,640 kL (434 kgal)
Supernatant volume	678 kL (179 kgal)
Saltcake volume	0 kL (0 kgal)
Sludge volume	965 kL (255 kgal)
Drainable interstitial liquid volume	90.8 kL (24 kgal)
Waste surface level (4/30/98)[3]	401 cm (157.9 in.)
Temperature (4/30/97 to 4/30/98)	11.7 °C (53 °F) to 20.6 °C (69 °F)
Integrity	Sound
Watch List	None
Flammable Gas Facility Group	2
SAMPLING DATE	
Core sample	May 1997
Grab sample	August 1996
SERVICE STATUS	
In service	1980 to present

Notes:

[1]Hanlon (1998)

[2]Waste volume is estimated from surface-level measurements using ENRAF[1] surface level gauges.

[3]Dates are in mm/dd/yy format.

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[1]ENRAF is a trademark of ENRAF Corporation, Houston, Texas.

2.0 RESPONSE TO TECHNICAL ISSUES

Three technical issues have been identified for tank 241-AW-105 (Brown et al. 1997).

- **Safety screening**: Does the waste pose or contribute to any recognized potential safety problems?
- **Organic solvents**: Does an organic solvent pool exist that may cause a fire or ignition of organic solvents in entrained waste solids?
- **Compatibility**: Will safety problems be created as a result of commingling wastes in interim storage? Do operations issues exist that should be addressed before waste is transferred?

The sampling and analysis plan (SAP) (Sasaki 1996, 1997) specifies the types of sampling and analysis used to address the above issues. Data from analysis of push core samples and tank headspace flammability measurements, along with available historical information, provided the means to respond to the technical issues. Sections 2.1 through 2.5 present the response. See Appendix B for sampling and analysis data for tank 241-AW-105.

The waste in tank 241-AW-105 is also of interest for pretreatment and privatization (Brown et al. 1997). However, at this time, no samples or analytical data are required from this tank to support these issues.

2.1 SAFETY SCREENING

The data needed to screen the waste in tank 241-AW-105 for potential safety problems are documented in *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995). These potential safety problems are exothermic conditions in the waste, flammable gases in the waste and/or tank headspace, and criticality conditions in the waste. Each condition is addressed separately below.

2.1.1 Exothermic Conditions (Energetics)

The first requirement outlined in the safety screening DQO (Dukelow et al. 1995) is to ensure there are not sufficient exothermic constituents (organic or ferrocyanide) in tank 241-AW-105 to pose a safety hazard. Because of this requirement, energetics in tank 241-AW-105 waste were evaluated. The safety screening DQO required the waste sample profile be tested for energetics every 24 cm (9.5 in.) to determine whether the energetics exceeded the safety threshold limit. The threshold limit for energetics is 480 J/g on a dry weight basis. Results obtained using differential scanning calorimetry (DSC) indicated that no sample obtained from tank 241-AW-105 had mean exothermic reactions (on a dry weight basis) exceeding the safety screening DQO limit. The maximum dry weight exotherm observed was 5.29 J/g. The maximum upper limit to a 95 percent confidence interval on the mean was 19.3 J/g from core 195, segment 7, upper half.

2.1.2 Flammable Gas

Headspace measurements were taken from riser 15A before the May 1997 push core sampling event. Additional measurements were obtained in August 1996 from risers 10A and 15A before the grab sampling event. All flammable gas measurements indicated that the gases in the tank headspace were $\leq$ 1 percent of the lower flammability limit (LFL). Data from these vapor phase measurements are presented in Appendix B.

2.1.3 Criticality

The safety screening DQO threshold for criticality, based on total alpha activity, is 1 g/L. Because total alpha activity is measured in μCi/mL instead of g/L, the 1-g/L limit is converted into units of μCi/mL by assuming that all alpha decay originates from ^{239}Pu. The safety threshold limit is 1 g ^{239}Pu per liter of waste. Assuming that all alpha is from ^{239}Pu and using the mean solid density of 1.30 g/mL, the safety limit of 1 g/L or 61.5 μCi/mL of ^{239}Pu converts to 47.3 μCi/g of alpha activity for solids. The maximum total alpha activity result was 4.95 μCi/g. The maximum upper limit to a 95 percent confidence interval on the mean was 5.14 μCi/g from core 196, segment 4, lower half (see Appendix C). This result indicates that the potential for a criticality event is extremely low. Therefore, criticality is not a concern with the waste currently contained in this tank.

2.2 ORGANIC SOLVENTS SAFETY SCREENING

The data required to support the organic solvents safety screening issue are documented in *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue* (Meacham et al. 1997). The DQO requires that tank headspace samples be analyzed for total nonmethane organic compounds to determine whether an organic extractant pool exists in the tank, and if there is, determine if it is a hazard. The purpose of this assessment is to ensure that an organic solvent pool fire or ignition of organic solvents cannot occur.

No vapor samples have been taken to estimate the organic pool size. However, the Organic Program has determined that even if an organic solvent pool does exist, the consequence of a fire or ignition of organic solvents is below risk evaluation guidelines for all tanks (Brown et al. 1997). Consequently, vapor samples are not required for this tank. The organic solvents issue is expected to be closed for all tanks in fiscal year 1998.

2.3 WASTE COMPATIBILITY

Grab samples were obtained from tank 241-AW-105 in August 1996 to assess the mixing of K Basin sludge with the tank waste. In accordance with Mulkey and Miller (1997) and Fowler (1995), tank 241-AW-105 was analyzed to assess the safety and operational implications of commingling the wastes in the tank with other wastes. Safety considerations included energetics, criticality, flammable gas generation and accumulation, corrosion and leakage, and chemical reactions. Operational considerations included transuranic segregation, heat load limits of the receiving tank, plugged pipelines and equipment, and complexant waste segregation. Not all operational considerations were within the scope of this report, notably the waste's potential chemical reactivity in a variety of different situations, and the waste's tendency to plug piping and equipment.

An assessment of analytical results for tank 241-AW-105 and waste compatibility requirements is included in the 1996 grab samples analytical report (Esch 1997). The assessment showed that all compatibility requirements were met.

Additional evaluations to assess the compatibility of K Basin sludge with tank 241-AW-105 sludge are in progress.

2.4 OTHER TECHNICAL ISSUES

2.4.1 Tank Waste Heat Load

A factor in assessing tank safety is the waste's heat generation and temperature. Heat is generated in the tanks from radioactive decay. Based on results from the 1996 and 1997 sampling events, the most significant decay heat contributors in the waste are ^{90}Sr and ^{137}Cs, contributing 79,700 and 44,800 Ci, respectively. The heat load calculations indicate that 818 W (2,790 Btu/hr) of heat are produced in the tank. The heat load estimate based on the tank process history was 1,110 W (3,790 Btu/hr) (Agnew 1997a), and the heat load estimate based on tank radionuclide content (Kummerer 1995) was 498 W (1,700 Btu/hr). All three estimates are below the 20,500-W (70,000-Btu/hr) operational limit for AW farm tanks (Cox 1997).

2.5 SUMMARY

The results from all analyses performed to address potential safety and operational issues showed that no primary analyte exceeded any decision threshold limits. Three supernatant samples from the 1996 grab sampling event and two solid samples from the 1997 core sampling event exceeded the safety screening total organic carbon (TOC) notification limit of 3 weight percent carbon on a dry weight basis. However, because no exotherms were observed in the DSC analyses, and because the samples contained sufficient water (95, 55, and 63 weight percent) to prevent a propagating reaction, exceeding the notification limit was not considered a safety hazard. The safety screening DQO required analyses for DSC, thermogravimetric analysis (TGA), total alpha activity, and headspace flammable gas measurements. The waste compatibility DQO required analyses for DSC, specific activity, and examination for the presence of an organic layer. The analytical results are summarized in Table 2-1.

Table 2-1. Summary of Technical Issues.

Issue	Sub-issue	Result
Safety screening	Energetics	All exotherms were less than 3 J/g, far below the upper limit of 480 J/g.
	Flammable gas	Vapor measurements reported ≤1 percent of the LFL (combustible gas meter).
	Criticality	All analyses were less than 4 μCi/g, well below the total alpha limit of 47.3 μCi/g (including the 95 percent confidence interval upper limit).
Organic solvents	Solvent pool size	No vapor samples have been taken. This issue is expected to be closed in fiscal year 1998.
Waste compatibility	Energetics/organic layer Criticality Flammable gas accumulation Corrosion Transuranics Heat load High phosphate waste	All analytical results met compatibility safety and operational requirements.

3.0 BEST-BASIS STANDARD INVENTORY ESTIMATE

Information about chemical, radiological, and/or physical properties is used to perform safety analyses, engineering evaluations, and risk assessment associated with waste management activities, as well as to address regulatory issues. Waste management activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processes, and facilities for retrieving wastes and processing them into a form suitable for long-term storage and disposal.

Chemical and radiological inventory information are generally derived using three approaches: 1) component inventories are estimated using the results of sample analyses, 2) component inventories are predicted using the Hanford defined waste (HDW) model based on process knowledge and historical information, or 3) a tank-specific process estimate is made based on process flowsheets, reactor fuel data, essential material usage, and other operating data.

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of chemical information for tank 241-AW-105 was performed, and a best-basis inventory was established. This work, detailed in the following sections, follows the methodology established by the standard inventory task. The following information was used in the evaluation.

- Analytical data from the 1997 push mode core sampling event, the 1996 grab sampling event, the 1990 push mode core sampling event, and a 1986 push mode core sampling event (see Appendix B).

- Inventory estimates generated for this tank from the HDW model (Agnew et al. 1997a)

Based on this engineering assessment, a best-basis inventory was developed for tank 241-AW-105 using the 1997 core sampling and 1996 grab sampling analytical data. Where analytical data were not available, the HDW model inventory estimates reported by Agnew et al. (1997a) were used as the best basis for this tank.

Best-basis tank inventory values are derived for 46 key radionuclides, as defined in Section 3.1 of Kupfer et al. (1997), all decayed to a common report date of January 1, 1994. Often, waste sample analyses have only reported ^{90}Sr, ^{137}Cs, $^{239/240}Pu$, and total uranium, or total beta and total alpha, while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129}I, ^{154}Eu, ^{155}Eu, and ^{241}Am have been infrequently reported. For this reason, it has been necessary to derive most of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track the radionuclides' movement with tank waste transactions. These computer models are described in Section 6.1 of Kupfer et al. (1997), and in Watrous and Wootan (1997).

Model-generated values for radionuclides in any of the 177 Hanford Site tanks are reported in the HDW Rev. 4 model results (Agnew et al. 1997a). The best-basis value for any one analyte may be either a model result or a sample- or engineering assessment-based result, if available.

The best-basis inventory estimate for tank 241-AW-105 is presented in Tables 3-1 and 3-2. Mercury values were specified in Simpson (1998). Once the best-basis inventories were determined, the hydroxide inventory was calculated by performing a charge balance with the valence of other analytes. This charge balance approach is consistent with that used by Agnew et al. (1997a).

The inventory values reported in Tables 3-1 and 3-2 are subject to change. Refer to the Tank Characterization Database (LMHC 1998) for the most current inventory values.

Table 3-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AW-105 (Effective April 30, 1998). (2 sheets)

Analyte	Total Inventory (kg)[1]	Basis (S, M, E, or C)[2]	Comment
Al	3,570	S	
Bi	0	E	The waste types in the tank are not expected to contain bismuth.
Ca	1,285	S	Based on September 1986 sludge concentrations (ρ = 1.32)
Cl	623	S	
TIC as CO_3	10,400	S	
Cr	1,730	S	Based on September 1986 sludge concentrations (ρ = 1.32)
F	62,900	S	
Fe	4,100	S	Based on September 1986 sludge concentrations (ρ = 1.32)
Hg	0	E	Coating waste did not contain mercury after 1969 (Simpson 1998)
K	10,600	S	Based on September 1986 sludge concentrations and August 1996 supernatant concentrations

Table 3-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AW-105 (Effective April 30, 1998). (2 sheets)

Analyte	Total Inventory (kg)[1]	Basis (S, M, E, or C)[2]	Comment
La	362	S	Based on September 1986 sludge concentrations (ρ = 1.32)
Mn	2,870	S	Based on September 1986 sludge concentrations (ρ = 1.32)
Na	139,000	S	
Ni	305	S	Based on September 1986 sludge concentrations (ρ = 1.32)
NO_2	9,880	S	
NO_3	50,500	S	
OH_{TOTAL}	115,000	C	
Pb	441	S	Based on May 1990 sludge concentrations (ρ = 1.42)
PO_4	1,990	S	Based on May 1990 sludge concentrations (ρ = 1.42)
Si	2,600	S	
SO_4	2,870	S	
Sr	16.8	S	Based on September 1986 sludge concentrations (ρ = 1.32)
TOC	7,880	S	
U_{TOTAL}	40,500	S	
Zr	82,900	S	(Phosphorescence = 23,200)

Notes:

[1]Sample-based inventory estimates are based on a sludge volume of 965 kL (255 kgal) and a supernatant volume of 678 kL (179 kgal).

[2]S = sample-based (see Appendix B), M = HDW model-based (Agnew et al.(1997a), E = engineering assessment-based, C = calculated by charge balance; includes oxides as hydroxides, not including CO_3, NO_2, NO_3, PO_4, SO_4, and SiO_3.

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{3}H	12.4	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{14}C	2.05	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{59}Ni	1.08	M	
^{60}Co	221	S	
^{63}Ni	109	M	
^{79}Se	2.28	M	
^{90}Sr	80,000	S	
^{90}Y	80,000	S/E	Based on ^{90}Sr
^{93}Zr	10.9	M	
^{93m}Nb	8.01	M	
^{99}Tc	98.5	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{106}Ru	421	M	
^{113m}Cd	53.6	M	
^{125}Sb	1,580	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{126}Sn	3.51	M	
^{129}I	3.42	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{134}Cs	93.7	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{137}Cs	45,800	S	
^{137m}Ba	43,300	S/E	Based on 0.946 of ^{137}Cs activity
^{151}Sm	8,110	M	
^{152}Eu	3.56	M	
^{154}Eu	4,750	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{155}Eu	2,800	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{226}Ra	1.01E-04	M	

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{227}Ac	6.23E-04	M	
^{228}Ra	0.147	M	
^{229}Th	0.00340	M	
^{231}Pa	0.00244	M	
^{232}Th	0.0144	M	
^{232}U	1.50	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.857)
^{233}U	5.72	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 3.27)
^{234}U	19.4	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 11.1)
^{235}U	0.738	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.423)
^{236}U	1.55	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.887)
^{237}Np	0.439	M	
^{238}Pu	85.3	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{238}U	13.5	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 7.73)
^{239}Pu	1,050	S/M	Based on $^{239/240}Pu$ sample results using HDW isotopic ratios
^{240}Pu	315	S/M	Based on $^{239/240}Pu$ sample results using HDW isotopic ratios
^{241}Am	652	S	
^{241}Pu	12,900	S/M	Based on ^{239}Pu sample results using HDW isotopic ratios

Table 3-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{242}Cm	1.25	S/M	Based on ^{241}Am sample results using HDW isotopic ratios
^{242}Pu	0.0483	S/M	Based on ^{239}Pu sample results using HDW isotopic ratios
^{243}Am	0.0859	S/M	Based on ^{241}Am sample result using HDW isotopic ratios
^{243}Cm	10.2	S/E	4% of $^{243/244}$Cm consists of ^{243}Cm (based on 1990 sludge sample results)
^{244}Cm	246	S/E	96% of $^{243/244}$Cm consists of ^{244}Cm (based on 1990 sludge sample results)

Notes:

ICP = inductively coupled plasma spectroscopy

[1]Sample-based inventory estimates are based on a sludge volume of 965 kL (255 kgal) and a supernatant volume of 678 kL (179 kgal).

[2]S = sample-based (See Appendix B), M = HDW model-based (Agnew et al. 1997a), E= engineering assessment-based.

4.0 RECOMMENDATIONS

The sampling and analysis activities performed for tank 241-AW-105 have met all requirements of the safety screening DQO (Dukelow et al. 1995), the waste compatibility DQO (Fowler 1995), and the SAP (Sasaki 1997). With the exception of TOC, all analytical results were within the prescribed limits of the safety screening DQO. Two solid sample submitted for TOC analysis exceeded the notification limit of 3 weight percent on a dry weight basis. However, no exotherms were observed in the DSC analyses, and the water content of these samples (55 and 63 weight percent), indicates there is sufficient water to prevent a propagating reaction. The analytical results were within the safety and operational notification limits specified in the waste compatibility DQO. No vapor samples have been obtained to address the organic solvents DQO, but the issue is expected to be closed in fiscal year 1998.

Table 4-1 summarizes the Project Hanford Management Contractor (PHMC) TWRS Program review status and acceptance of the sampling and analysis results reported in this tank characterization report. All issues required to be addressed by sampling and analysis are listed in column 1 of Table 4-1. Column 2 indicates by "yes" or "no" whether issue requirements were met by the sampling and analysis performed. Column 3 indicates concurrence and acceptance by the program in PHMC/TWRS that is responsible for the applicable issue. A "yes" in column 3 indicates that no additional sampling or analyses are needed. Conversely, "no" indicates additional sampling or analysis may be needed to satisfy issue requirements.

Table 4-1. Acceptance of Tank 241-AW-105 Sampling and Analysis.

Issue	Sampling and Analysis Performed	Program[1] Acceptance
Safety screening DQO	Yes	Yes
Organic solvents DQO[2]	No	n/a
Waste compatibility DQO	Yes	Yes

Note:

[1]PHMC TWRS Program Office

[2]The organic solvents safety issue is expected to be closed in fiscal year 1998.

Table 4-2 summarizes the status of PHMC TWRS Program review and acceptance of the evaluations and other characterization information contained in this report. Column 1 lists the different evaluations performed in this report. Column 2 shows whether issue evaluations have been completed or are in progress. Column 3 indicates concurrence and acceptance with the evaluation by the program in PHMC/TWRS that is responsible for the applicable issue.

A "yes" indicates that the evaluation is completed and meets all issue requirements. A "no" indicates that evaluations are incomplete.

Table 4-2. Acceptance of Evaluation of Characterization Data and Information for Tank 241-AW-105.

Issue	Evaluation Performed	TWRS[1] Program Acceptance
Safety screening DQO	Yes	Yes
Organic solvents DQO[2]	No	No
Waste compatibility DQO	Yes	Yes

Note:

[1]PHMC TWRS Program Office

[2]The Organic solvents safety issue is expected to be closed in fiscal year 1998.

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APPENDIX A

HISTORICAL TANK INFORMATION

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APPENDIX A

HISTORICAL TANK INFORMATION

Appendix A describes tank 241-AW-105 based on historical information. For this report, historical information includes information about the fill history, waste types, surveillance, or modeling data about the tank. This information is necessary for providing a balanced assessment of sampling and analytical results.

This appendix contains the following information:

- **Section A1.0**: Current tank status, including the current waste levels and the tank stabilization and isolation status
- **Section A2.0**: Information about the tank design
- **Section A3.0**: Process knowledge about the tank, the waste transfer history, and the estimated contents of the tank based on modeling data
- **Section A4.0**: Surveillance data for tank 241-AW-105, including surface-level readings, temperatures, and a description of the waste surface based on photographs
- **Section A5.0**: Appendix A references.

A1.0 CURRENT TANK STATUS

As of April 30, 1998, tank 241-AW-105 contained an estimated 1,640 kL (434 kgal) of dilute noncomplexed waste and NCRW (Hanlon 1998). The waste volumes were estimated using an ENRAF™ surface level gauge. Table A1-1 shows the volumes of the waste phases found in the tank.

Tank 241-AW-105 is an active dilute waste receiver tank for the PUREX plant, and the tank's integrity is classified as sound. The tank is flat bottomed, actively ventilated, and not on any Watch List (Public Law 101-510).

Table A1-1. Tank Contents Status Summary.[1]

Waste Type	kL (kgal)
Total waste	1,640 (434)
Supernatant	678 (179)
Sludge	965 (255)
Saltcake	0 (0)
Drainable interstitial liquid	90.8 (24)
Drainable liquid remaining	768 (203)
Pumpable liquid remaining	685 (181)

Note:
[1]Hanlon (1998)

A2.0 TANK DESIGN AND BACKGROUND

Tank 241-AW-105 was constructed between 1978 and 1980 and went into service in 1980. It is one of six double-shell tanks comprising the 241-AW Tank Farm located in the southeast corner of the 200 East Area. These tanks are all at the same elevation with no cascade lines between them. Tank 241-AW-105 consists of a heat-treated (stress-relieved) primary steel liner inside a secondary liner, both of which are encased in a reinforced concrete shell and covered by a reinforced concrete dome. The maximum design temperature for liquid storage is 177 °C (350 °F). The tank has a diameter of 22.9 m (75 ft) and an operating depth of 10.7 m (35.2 ft) (Brevick et al. 1997). Although it has a design capacity for storing 4,390 kL (1,160 kgal) of waste, safety considerations limit the maximum operating capacity to 4,310 kL (1,140 kgal).

The waste surface level is monitored through riser 1A with a manual tape liquid level indicator, and with an ENRAF™ waste level gauge through riser 2A (Salazar 1994). Riser 4A contains a thermocouple tree. Figure A2-1 is a plan view of the riser configuration. A list of tank 241-AW-105 risers showing their sizes and general use is provided in Table A2-1.

A tank cross section showing the approximate waste level, along with a tank equipment schematic, is shown in Figure A2-2. Tank 241-AW-105 has 22 risers that provide access to the primary tank. Additional risers access the tank annulus. Risers 3A, 7A, 7B, and 12A are 30 cm (12 in.) in diameter; risers 5A, 5B, and 11A are 107 cm (42 in.) in diameter; and the remaining risers are all 10 cm (4 in.) in diameter. Risers 1C, 7A, 10A, 12A, 13A, and 15A are tentatively available for sampling (Lipnicki 1997).

Figure A2-1. Riser Configuration for Tank 241-AW-105.

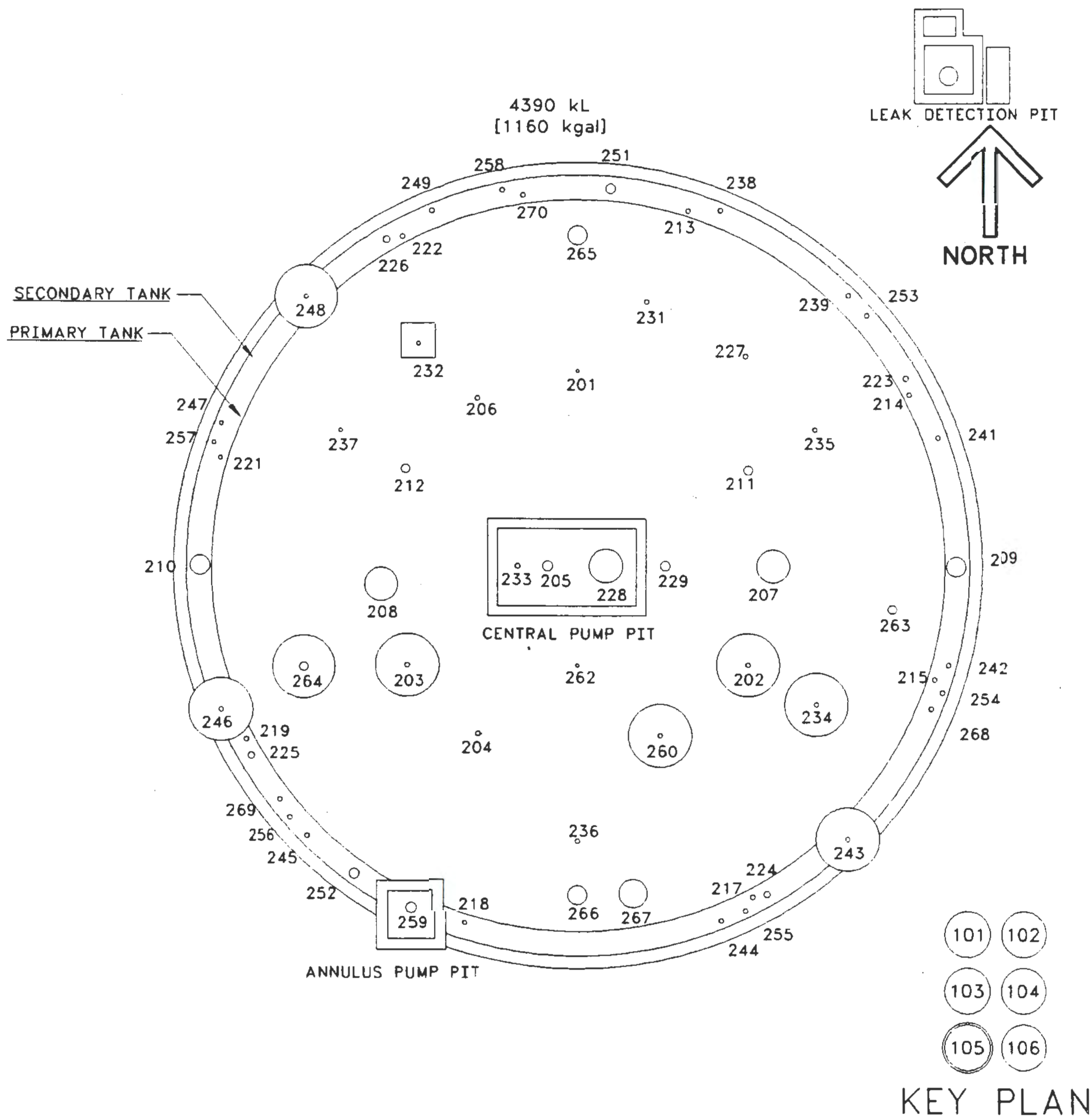


Table A2-1. Tank 241-AW-105 Risers.[1,2]

New Riser	Old Riser	Diameter (In.)	Description and Comments
201	R1A	4	Liquid level indicator (manual)
202	R1B	4	Sludge measurement port/spare
203[2]	R1C	4	Sludge measurement port/spare, port/coverplate (12-in. cover)
204	R2A	4	Tank level indicator, ENRAF™, (Engineering Change Order 624982, November 11, 1995)
205	R3A	12	Supernatant pump
206	R4A	4	Thermocouple tree
207	R5A	42	Manhole/spare
208	R5B	42	Manhole/spare
211[2]	R7A	12	Spare, port/coverplate (12-in. cover), tank air inlet controller, (Engineering Change Order 624519, February 27, 1996)
212	R7B	12	Vent, tank air outlet controller (Engineering Change Order 624519, February 2, 1996)
227[2]	R10A	4	Spare
228	R11A	42	Slurry distributor
229[2]	R12A	12	Observation port/spare
231[2]	R13A	4	Sludge measurement port/spare
232	R13B	4	Tank pressure, port/cover plate (24-in. cover)
233	R14A	4	Central pump pit dropleg nozzle supernatant return
234[2]	R15A	4	Spare
235	R16A	4	Sludge measurement port/spare
236	R16B	4	Tank pressure indicator, tank pressure indicator/vapor spare sampler (Engineering Change Order 629545, February 29, 1996)
237	R16C	4	Sludge measurement port/spare, port/coverplate (12-in. cover)
260	R21A	4	High level sensor
262	R22A	4	Sludge measurement port

Notes:

[1]Salazar (1994), Tran (1993), LMHC (1997,) and WHC (1995)

[2]Denotes risers tentatively available for sampling (Lipnicki 1997).

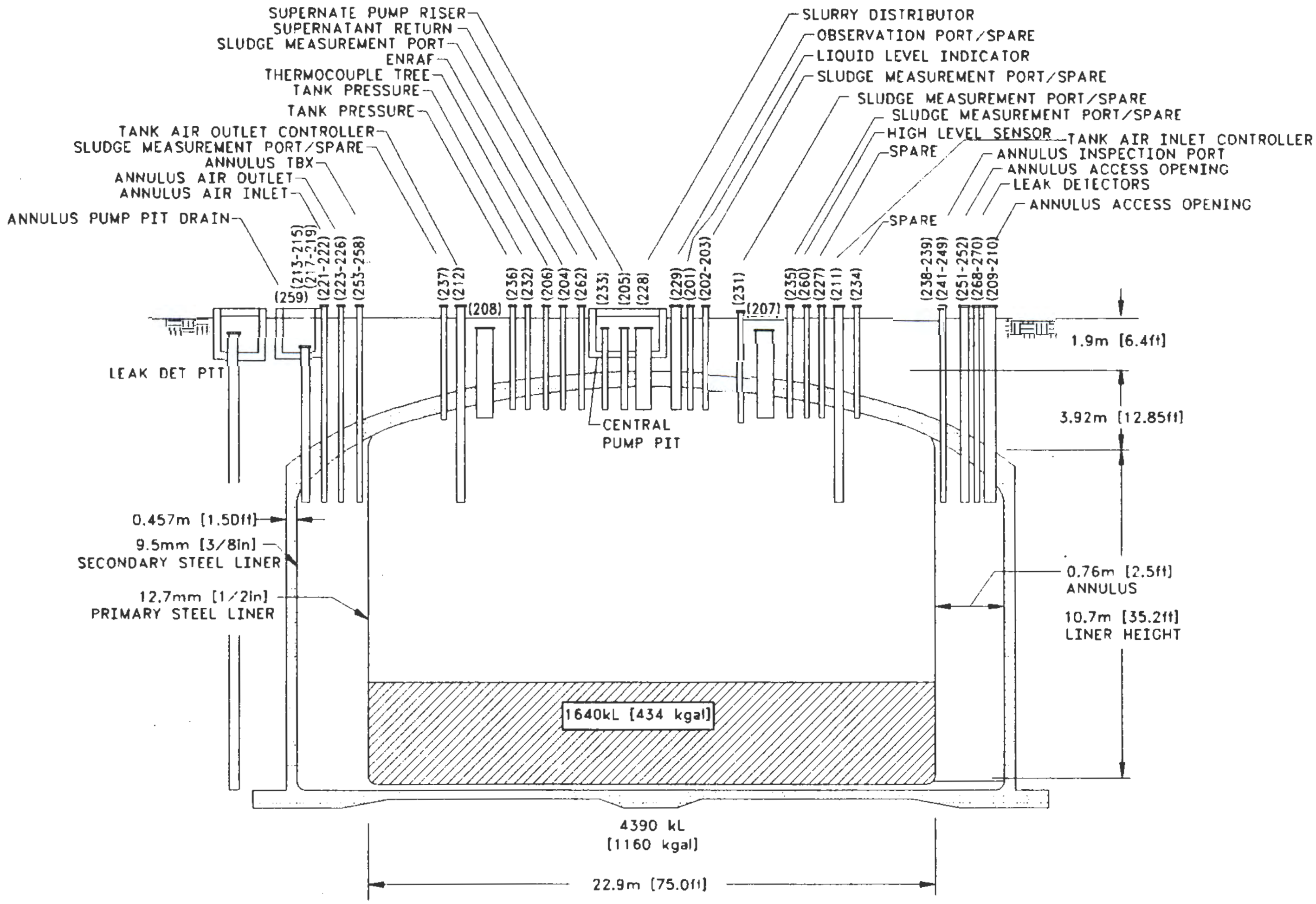


Figure A2-2. Tank 241-AW-105 Cross Section and Schematic.

A3.0 PROCESS KNOWLEDGE

The sections below 1) provide information about the transfer history of tank 241-AW-105, 2) describe the process wastes that made up the transfers, and 3) estimate the current tank contents based on transfer history.

A3.1 WASTE TRANSFER HISTORY

Table A3-1 summarizes the waste transfer history of tank 241-AW-105 (Agnew et al. 1997b and Koreski 1998). The first waste received by tank 241-AW-105 was a small amount of flush water in August 1980. Later that month, the tank received complexed concentrate waste from the 242-A Evaporator (Teats 1982). Agnew et al. (1997b) indicates that the complexed concentrate waste was received from tank 241-A-102; however, the waste actually originated in the 200 West Area and was transferred to tank 241-A-101 before waste volume reduction in the 242-A Evaporator and storage in tank 241-AW-105 (Teats 1982). This transfer brought the tank's waste volume to 3,580 kL (946 kgal). In the third quarter of 1982, the tank received dilute noncomplexed waste from tank 241-AW-104. In 1983, the tank received dilute noncomplexed waste from tanks 241-AW-103, 241-AW-104, and from B Plant; and supernatant waste was transferred to tanks 241-AW-101 and 241-AN-102.

From the second quarter of 1983 to the third quarter of 1984, the tank was a receiver for PUREX dilute complexed waste. Transfers were made between tanks 241-AW-102 and 241-AW-105 in support of evaporator operations from the third quarter of 1983 to the fourth quarter of 1988.

In 1984, waste was sent from tank 241-AW-105 to tanks 241-AZ-102 and 241-AN-101. From the third quarter of 1984 to the second quarter of 1988, the tank received sludge and supernatant decladding waste from PUREX. In 1985, tank 241-AW-105 received salt well liquor from various single-shell tanks. A small amount of waste from an unknown source was received in the second quarter of 1989.

From the third quarter of 1988 through the first quarter of 1990, tank 241-AW-105 received spent metathesis waste from PUREX. The tank resumed receiving noncomplexed waste from PUREX from the third quarter of 1992 through the second quarter of 1996. This waste consists of process solutions such as sump water, steam condensate, rainwater, and laboratory waste. Throughout its operation, the tank received numerous transfers of flush water from various sources. Most of the water probably came from line flushes following waste transfers. In the fourth quarter of 1994, dilute noncomplexed waste was transferred to tank 241-AP-108, and in the fourth quarter of 1995, dilute noncomplexed waste was transferred to tank 241-AP-104.

Table A3-1. Tank 241-AW-105 Major Transfers.[1,2] (2 sheets)

Transfer Source	Transfer Destination	Waste Type	Time Period	Estimated Volume	
				kL	kgal
242-A Evaporator[3]	---	Complexant concentrate waste	1980	3,550	938
241-AW-104 241-AW-103	---	Dilute noncomplexed	1982-1983	1,300	343
B Plant	---	Dilute noncomplexed	1983	49	13
---	241-AW-101	Supernatant	1983	-3,854	-1,018
PUREX	---	Dilute noncomplexed (PUREX waste)	1983-1984	6,821	1,802
241-AW-102 241-AW-103 241-AW-104	---	Dilute noncomplexed	1983	1,098	290
---	241-AW-102	242-A Evaporator feed	1983	-185	-49
---	241-AW-101 241-AN-102 241-AZ-102 241-AN-101	Dilute noncomplexed	1983-1984	- 3,110	- 822
PUREX	---	PUREX decladding waste	1984-1985	734	194
241-AW-102	---	Dilute noncomplexed	1984	227	60
---	241-AW-102	Dilute noncomplexed	1984-1986	-10,406	-2,749
241-BY-101 241-TY-105 241-C-111 241-C-104	---	Salt well liquid[4]	1985	1,230	325
PUREX	---	PUREX decladding waste	1987-1988	867	229
241-AW-102	---	Dilute noncomplexed	1987-1988	2,646	699
---	241-AW-102	Dilute noncomplexed	1987-1988	-4,902	-1,295
241-AW-102	---	Hot semiworks transuranic solids	1988	322	85
PUREX	---	PUREX spent metathesis waste	1988-1990	965	255
Unknown	---	Unknown	1989	11	3
PUREX	---	Dilute noncomplexed	1992-1996	2,370	626

Table A3-1. Tank 241-AW-105 Major Transfers.[1,2] (2 sheets)

Transfer Source	Transfer Destination	Waste Type	Time Period	Estimated Volume	
				kL	kgal
---	241-AP-108 241-AP-104	Dilute noncomplexed	1994-1995	-4,141	- 1,094

Notes:

[1]Agnew et al. (1997b) and Koreski (1998)

[2]Because only major transfers are listed, the sum of these transfers will not equal the current tank waste volume. Also, multiple additions of water (primarily line flushes following transfers) and losses from evaporation occurred over the years on a regular basis and are not shown in the table.

[3]Agnew et al. (1997b) incorrectly identifies transfer source as tank 241-A-102.

[4]There is no reference data for these transfers.

A3.2 HISTORICAL ESTIMATION OF TANK CONTENTS

The historical transfer data used for this estimate are from the following sources.

- The *Waste Status and Transaction Record Summary: WSTRS, Rev. 4*, (Agnew et al. 1997b) is a tank-by-tank quarterly summary spreadsheet of waste transactions.

- The *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al. 1997a) contains the HDW list, the supernatant mixing model (SMM), the tank layer model (TLM), and the historical tank content estimate.

- The HDW list is comprised of approximately 50 waste types defined by concentration for major analytes/compounds for sludge and supernatant layers.

- The TLM defines the sludge and saltcake layers in each tank using waste composition and waste transfer information.

- The SMM is a subroutine within the HDW model that calculates the volume and composition of certain supernatant blends and concentrates.

Using these records, the TLM defines the sludge and saltcake layers in each tank. The SMM uses information from the *Waste Status and Transaction Record Summary (WSTRS) Rev. 4*

(Agnew et al. 1997b), the TLM, and the HDW list to describe the supernatants and concentrates in each tank. Together the WSTRS, TLM, SMM, and HDW list determine the inventory estimate for each tank. These model predictions are considered estimates that require further evaluation using analytical data.

Based on Agnew et al. (1997a), the tank 241-AW-105 sludge layer contains small amounts of PUREX low-level waste on the top and bottom, concentrated 242-A Evaporator salt slurry (SMMA2) waste in the middle, and a layer of NCRW above and below the SMMA2 waste. The TLM does not include the supernatant portion of the tank waste. Figure A3-1 shows a graphical representation of the estimated waste types and volume. The PUREX low-level waste layers should contain greater than one weight percent iron, hydroxide, carbonate, sodium, calcium, nitrate, and uranium. The NCRW layers should contain greater than one weight percent sodium, iron, zirconium, hydroxide, fluoride, and nitrate. The specific estimated concentrations of the constituents of the SMMA2 layer are not calculated by Agnew et al. (1997a). Cesium and strontium were present in relatively small quantities in the two waste types described, accounting for the low heat load estimate given in Table A3-2. Table A3-2 shows the historical estimate of the expected waste constituents and their concentrations. The HDW only takes into account waste transfers through 1993. The supernatant in tank 241-AW-105 in 1993 has since been transferred out of the tank, so the HDW estimate of the supernatant no longer reflects the tank contents. Therefore, Table A3-2 provides the HDW estimate for the tank 241-AW-105 TLM solids only, and does not include any SMM waste.

Figure A3-1. Tank Layer Model.

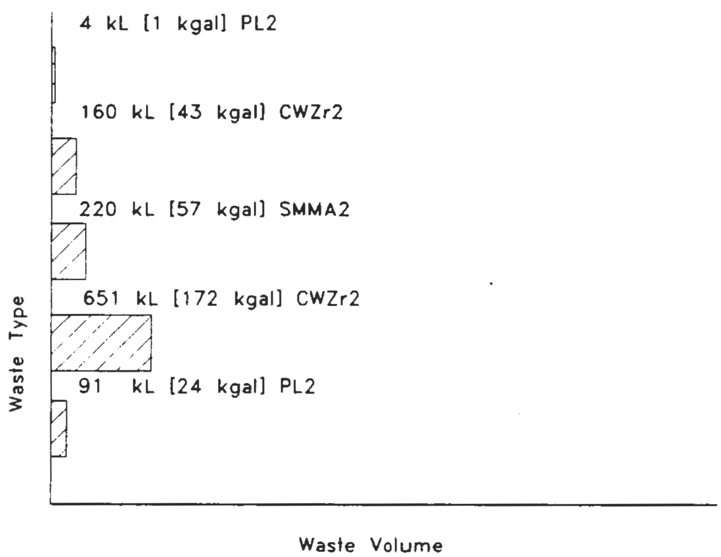


Table A3-2. Historical Tank Solids Inventory Estimate.[1,2] (4 sheets)

TLM Solids Inventory Estimate					
Physical Properties				**-95 CI**	**+95 CI**
TLM solid waste[3]	1.16E+06 (kg)	(240 kgal)	----	----	----
Heat load	4.21E-02 (kW)	(144 Btu/hr)	----	6.88E-04	8.29E-02
Bulk density[4]	1.28 (g/cm^3)	----	----	1.02	1.33
Void fraction	0.854	----	----	0.832	0.988
Water wt%[3]	64.1	----	----	58.2	96.6
TOC wt% C (wet)[3]	3.55E-03	----	----	1.61E-03	5.45E-03
Chemical Constituents	***M***	**ppm**	**kg[5]**	**-95 CI *M***	**+95 CI *M***
Na^+	4.99	8.94E+04	1.04E+05	7.22E-02	6.19
Al^{3+}	0	0	0	0	0
Fe^{3+}	0.524	2.28E+04	2.66E+04	0.199	0.533
Cr^{3+}	7.42E-04	30.1	35.0	3.33E-04	1.14E-03
Bi^{3+}	0	0	0	0	0
La^{3+}	0	0	0	0	0
Hg^{2+}	1.88E-03	294	342	2.90E-06	1.92E-03
Zr (as $ZrO(OH)_2$)	0.830	5.91E+04	6.88E+04	1.26E-03	0.843
Pb^{2+}	4.03E-06	0.651	0.758	1.81E-06	6.21E-06
Ni^{2+}	1.16E-02	533	621	1.67E-04	1.51E-02
Sr^{2+}	0	0	0	0	0
Mn^{4+}	5.56E-04	23.8	27.8	2.50E-04	2.48E-03
Ca^{2+}	0.133	4.15E+03	4.84E+03	4.81E-02	0.171
K^+	0.172	5.24E+03	6.10E+03	3.43E-03	0.337
OH^-	5.22	6.93E+04	8.07E+04	0.661	5.45
NO^{3-}	0.321	1.55E+04	1.81E+04	2.87E-02	0.603
NO^{2-}	9.16E-03	328	383	1.02E-03	2.26E-02
CO_3^{2-}	0.142	6.66E+03	7.76E+03	5.76E-02	0.181
PO_4^{3-}	6.44E-03	477	556	2.90E-03	9.94E-03
SO_4^{2-}	3.75E-04	28.1	32.7	1.68E-04	5.78E-04
Si	0	0	0	0	0
F^-	4.74	7.02E+04	8.17E+04	9.74E-03	5.75

Table A3-2. Historical Tank Solids Inventory Estimate.[1,2] (4 sheets)

TLM Solids Inventory Estimate					
Chemical Constituents (Cont'd)	***M***	**ppm**	**kg[4]**	**-95 CI *M***	**+95 CI *M***
Cl^-	3.92E-03	108	126	4.21E-04	7.37E-03
$C_6H_5O_7^{3-}$	0	0	0	0	0
$EDTA^{4-}$	0	0	0	0	0
$HEDTA^{3-}$	0	0	0	0	0
$Glycolate^-$	0	0	0	0	0
$Acetate^-$	0	0	0	0	0
$Oxalate^{2-}$	0	0	0	0	0
DBP	3.16E-04	51.8	60.3	1.42E-04	4.87E-04
Butanol	3.16E-04	18.3	21.3	1.42E-04	4.87E-04
NH_3	0.587	7.78E+03	9.06E+03	9.74E-03	1.13
$Fe(CN)_6^{4-}$	0	0	0	0	0
Radiological Constituents	**Ci/L**	**μCi/g**	**Ci[4]**	**-95 CI (Ci/L)**	**+95 CI (Ci/L)**
^3H	1.56E-05	1.22E-02	14.2	2.56E-07	3.08E-05
^{14}C	1.93E-07	1.50E-04	0.175	3.15E-09	3.79E-07
^{59}Ni	1.27E-07	9.90E-05	0.115	1.27E-07	1.27E-07
^{63}Ni	1.47E-05	1.14E-02	13.3	1.47E-05	1.47E-05
^{60}Co	2.97E-06	2.32E-03	2.70	4.85E-08	5.85E-06
^{79}Se	2.41E-08	1.88E-05	2.19E-02	3.94E-10	4.74E-08
^{90}Sr	3.78E-03	2.94	3.43E+03	6.17E-05	7.44E-03
^{90}Y	3.78E-03	2.95	3.43E+03	6.17E-05	7.44E-03
^{93}Zr	1.16E-07	9.06E-05	0.105	1.90E-09	2.29E-07
^{93m}Nb	4.90E-08	3.82E-05	4.45E-02	8.01E-10	9.66E-08
^{99}Tc	8.04E-07	6.27E-04	0.731	1.31E-08	1.58E-06
^{106}Ru	4.63E-04	0.361	421	4.60E-04	4.63E-04
^{113m}Cd	1.25E-06	9.78E-04	1.14	2.05E-08	2.47E-06
^{125}Sb	7.19E-05	5.61E-02	65.3	1.18E-06	1.42E-04
^{126}Sn	3.80E-08	2.96E-05	3.45E-02	6.20E-10	7.48E-08
^{129}I	1.62E-09	1.26E-06	1.47E-03	2.64E-11	3.18E-09

Table A3-2. Historical Tank Solids Inventory Estimate.[1, 2] (4 sheets)

TLM Solids Inventory Estimate					
Radiological Constituents (Cont'd)	Ci/L	µCi/g	Ci[4]	-95 CI (Ci/L)	+95 CI (Ci/L)
^{134}Cs	3.19E-05	2.49E-02	29.0	5.22E-07	6.29E-05
^{137}Cs	4.46E-03	3.48	4.05E+03	7.29E-05	8.78E-03
^{137m}Ba	4.22E-03	3.29	3.83E+03	6.89E-05	8.30E-03
^{151}Sm	8.33E-05	6.49E-02	75.6	1.36E-06	1.64E-04
^{152}Eu	9.38E-07	7.32E-04	0.852	8.61E-07	1.01E-06
^{154}Eu	2.22E-05	1.73E-02	20.2	3.63E-07	4.37E-05
^{155}Eu	1.70E-04	0.133	155	1.56E-04	1.84E-04
^{226}Ra	1.94E-13	1.51E-10	1.76E-07	3.17E-15	3.82E-13
^{228}Ra	8.50E-17	6.63E-14	7.72E-11	7.80E-17	9.19E-17
^{227}Ac	1.12E-12	8.70E-10	1.01E-06	1.82E-14	2.20E-12
^{231}Pa	6.37E-12	4.97E-09	5.78E-06	1.04E-13	1.25E-11
^{229}Th	9.72E-15	7.58E-12	8.83E-09	8.93E-15	1.05E-14
^{232}Th	3.25E-17	2.54E-14	2.95E-11	5.32E-19	6.40E-17
^{232}U	1.07E-09	8.32E-07	9.69E-04	1.53E-10	1.50E-09
^{233}U	1.09E-11	8.53E-09	9.94E-06	1.56E-12	1.54E-11
^{234}U	4.80E-06	3.74E-03	4.36	6.86E-07	6.75E-06
^{235}U	1.82E-07	1.42E-04	0.166	2.61E-08	2.57E-07
^{236}U	3.95E-07	3.08E-04	0.359	5.65E-08	5.56E-07
^{238}U	3.29E-06	2.57E-03	2.99	4.71E-07	4.64E-06
^{237}Np	1.18E-08	9.19E-06	1.07E-02	1.93E-10	2.32E-08
^{238}Pu	1.37E-04	0.107	124	2.91E-05	1.43E-04
^{239}Pu	1.11E-03	0.866	1.01E+03	2.36E-04	1.16E-03
^{240}Pu	3.37E-04	0.263	306	7.16E-05	3.51E-04
^{241}Pu	1.40E-02	10.9	1.27E+04	2.97E-03	1.46E-02
^{242}Pu	5.22E-08	4.07E-05	4.74E-02	1.11E-08	5.43E-08
^{241}Am	1.48E-05	1.16E-02	13.5	2.43E-07	9.69E-05
^{243}Am	3.13E-09	2.44E-06	2.84E-03	5.11E-11	2.04E-08
^{242}Cm	8.26E-08	6.44E-05	7.50E-02	7.59E-08	8.93E-08
^{243}Cm	1.38E-08	1.08E-05	1.26E-02	1.27E-08	1.50E-08
^{244}Cm	5.69E-08	4.44E-05	5.17E-02	9.30E-10	4.05E-07

Table A3-2. Historical Tank Solids Inventory Estimate.[1, 2] (4 sheets)

TLM Solids Inventory Estimate					
Totals	M	µg/g	kg	-95 CI (*M* or g/L)	+95 CI (*M* or g/L)
Pu	1.95E-02 (g/L)	----	17.7	4.14E-03	2.03E-02
U	4.16E-02	7.71E+03	8.98E+03	5.94E-03	5.85E-02

Notes:

CI = confidence interval

[1]Agnew et al. (1997a)

[2]These predictions have not been validated and should be used with caution.

[3]This is the volume average for density, mass average water wt%, and TOC wt% carbon.

[4]Differences exist among the inventories in this column and the inventories calculated from the two sets of concentrations.

[5]Does not account for SMMA2 solids in the tank.

A4.0 SURVEILLANCE DATA

Tank 241-AW-105 surveillance consists of surface-level measurements (liquid and solid), temperature monitoring inside the tank (waste and headspace). The tank annulus is equipped with leak-detection instrumentation consisting of continuous air monitors and conductivity probes. Surveillance data provide the basis for determining tank integrity. For double-shell tanks, the leak detection instruments are the principal means of detecting a leak from the primary tank; liquid level measurements may be used to confirm a possible leak detected by the annulus instruments. No occurrence reports have been written against tank 241-AW-105 that would indicate a leak from the primary tank. Solid surface-level measurements indicate physical changes in and consistencies of the tank's solid layers (Brevick et al. 1997, Jensen 1997, and Welty 1988).

A4.1 SURFACE-LEVEL READINGS

Tank 241-AW-105 is categorized as a sound tank. The waste surface level is monitored with an ENRAF™ gauge located in riser 2A and a manual tape located in riser 1A. Manual readings are required daily if the ENRAF™ gauge fails or if the Computer Automated Surveillance System readings are zero. On April 30, 1998, the ENRAF™ reading was 401 cm (157.9 in.) and the manual tape reading was 400 cm (157.5 in.). The level history graph of the volume measurements is presented in Figure A4-1, showing the continually changing waste levels in the tank since it entered service in 1980.

A4.2 INTERNAL TANK TEMPERATURES

Tank 241-AW-105 has a single thermocouple tree with 18 thermocouples to monitor the waste temperature through riser 4A. These thermocouples are located at 0.61-m (2-ft) intervals, except the two nearest the waste surface, which are 1.22 m (4 ft) apart (Tran 1993). Temperature data are available from the Surveillance Analysis Computer System recorded from July 1989 to April 1998 for thermocouples 1, 3, 3, 5, 7, 11, and 17.

The average tank temperature between April 30, 1997 and April 30, 1998 was 15.8 °C (60.5 °F), the minimum was 11.7 °C (53.0 °F), and the maximum was 20.6 °C (69.0 °F). Plots of the thermocouple readings can be found in the *Supporting Document for the Historical Tank Content Estimate for AW-Tank Farm* (Brevick et al. 1997). Figure A4-2 shows a graph of the weekly high temperature.

A4.3 TANK 241-AW-105 PHOTOGRAPHS

There are no in-tank photographs for tank 241-AW-105.

Figure A4-1. Tank 241-AW-105 Level History.

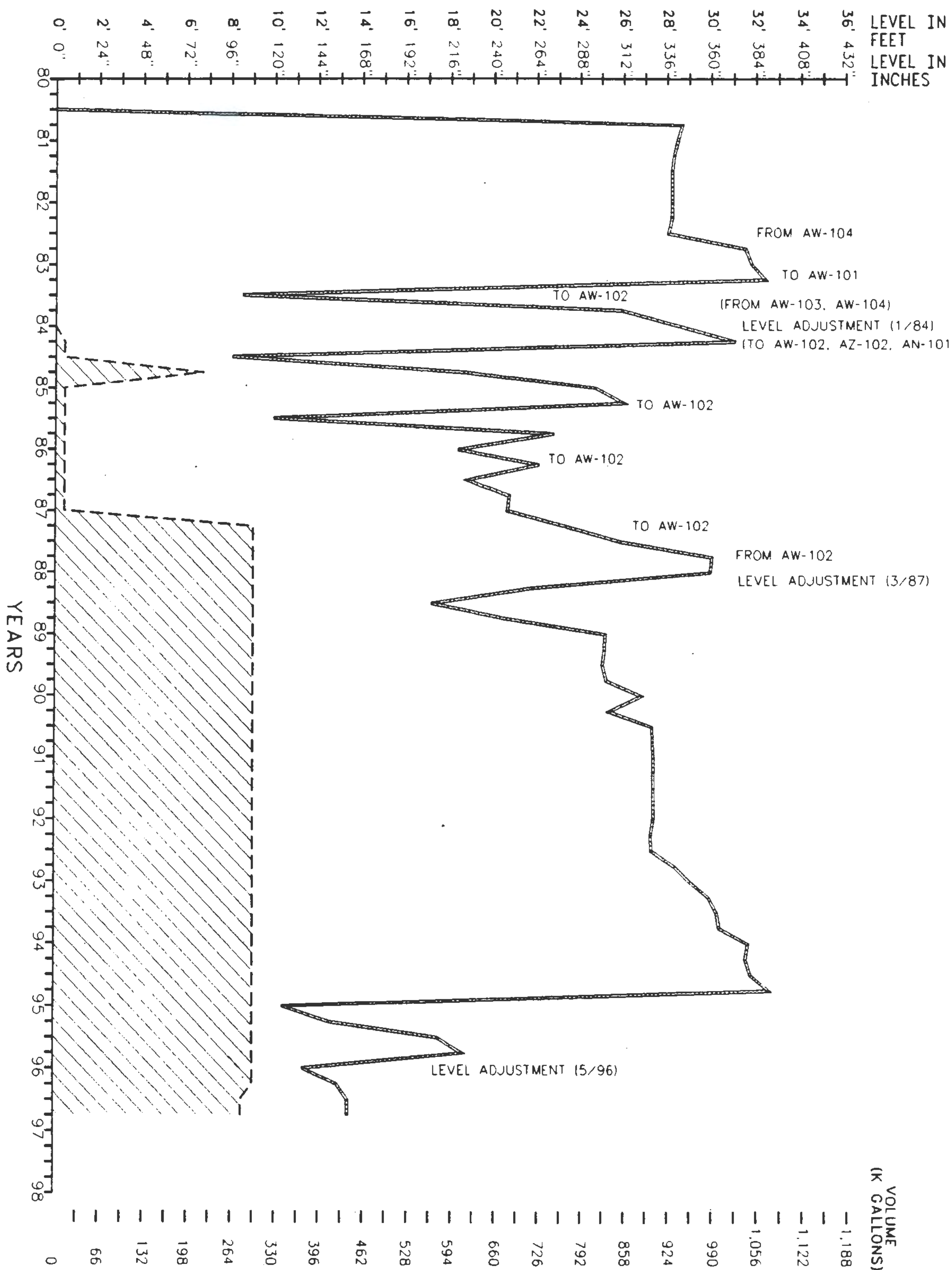
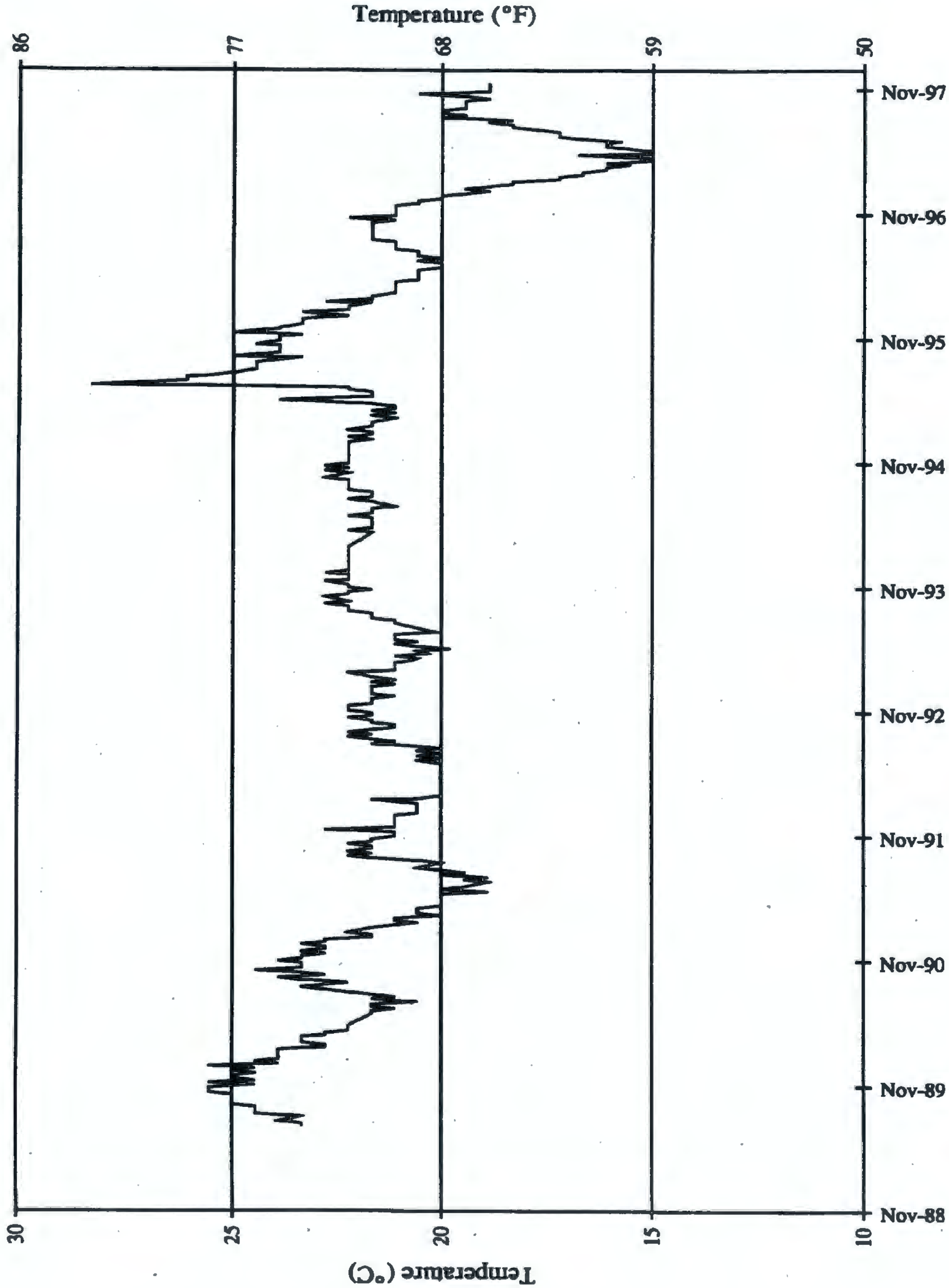


Figure A4-2. Tank 241-AW-105 High Temperature Plot.



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APPENDIX B

SAMPLING OF TANK 241-AW-105

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APPENDIX B

SAMPLING OF TANK 241-AW-105

Appendix B provides sampling and analysis information for each known sampling event for tank 241-AW-105 and an assessment of the sample results. Appendix B includes the following.

- **Section B1.0**: Tank Sampling Overview
- **Section B2.0**: Sampling Events
- **Section B3.0**: Assessment of Characterization Results
- **Section B4.0**: Appendix B References

B1.0 TANK SAMPLING OVERVIEW

Appendix B describes the sampling and analysis events for tank 241-AW-105. Push mode core samples were taken in May 1997 and grab samples were taken in August 1996 to satisfy the requirements of *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Data Quality Objective to Support Resolution of the Organic Solvent Safety Issue* (Meacham et al. 1997), and *Data Quality Objectives for Tank Farms Waste Compatibility Program* (Fowler 1995 and Mulkey and Miller 1997). The sampling and analyses were performed in accordance with *Tank 241-AW-105 Push Mode Core Sampling and Analysis Plan* (Sasaki 1997) and *Compatibility Grab Sampling and Analysis Plan* (Sasaki 1996). Further discussions of the sampling and analysis procedures can be found in *Tank Characterization Reference Guide* (DeLorenzo et al. 1994). Several historical sampling events for this tank are discussed in Section B2.3.

B2.0 SAMPLING EVENTS

This section describes sampling events. The principal analytical results used to characterize current tank contents were from the 1997 push core sample and the 1996 grab sample. Table B2-1 summarizes the sampling and analytical requirements from the safety screening and waste compatibility DQOs.

B2.1 1997 CORE SAMPLING EVENT

Two core samples were collected from tank 241-AW-105. Core 195 was received on May 13, and core 196 was received on May 22 and 23, 1997. The first core was collected from riser 10A on May 9 and 12, 1997 and extruded at the 222-S Laboratory on May 20 to 22, 1997. The second core was collected from riser 12A on May 14, 1997 and extruded by the 222-S Laboratory on May 27, 1997.

The purpose of the May 1997 core sampling event was to characterize the solid waste on the tank bottom. In accordance with Sasaki 1997, two cores were to be obtained from the tank bottom through risers 10A and 12A, with six segments expected in each core. Cores 195 and 196 were obtained from risers 10A and 12A, respectively. Because grab samples of the liquid layer in the tank had been obtained in August 1996, additional liquid segment sampling was determined to be unnecessary.

A field blank was provided to the 222-S Laboratory with core 195. The field blank underwent the same analysis as the drainable liquid, as instructed by Sasaki (1997).

Safety screening analyses included total alpha to determine criticality, DSC to ascertain the fuel energy value, and TGA to obtain the total moisture content. In addition, combustible gas meter readings in the tank headspace were performed to measure flammability. The current revision of the safety screening DQO (Dukelow et al. 1995) also requires bulk density measurements.

Lithium bromide-traced water was used to maintain back pressure on the drill string during sampling. Each sample segment underwent ICP analysis for lithium and ion chromatography (IC) analysis for bromide to determine how much, if any, external water entered the sample during sampling.

Table B2-1 summarizes the sampling and analytical requirements from the safety screening and waste compatibility DQOs.

Table B2-1. Integrated Data Quality Objective Requirements for Tank 241-AW-105.[1]

Sampling Event	Applicable DQOs	Sampling Requirements	Analytical Requirements
Push mode core sampling	Safety screening - Energetics - Moisture content - Total alpha - Flammable gas Dukelow et al. (1995)	Core samples from a minimum of two risers separated radially to the maximum extent possible Combustible gas measurement	Flammability, energetics, moisture, total alpha activity, density, anions, cations
Grab sampling	Compatibility Mulkey and Miller (1997) Fowler 1995	Grab samples	Energetics, moisture, anions, cations, radionuclides, specific gravity, pH, separable organics, TOC, TIC, percent solids
Vapor sampling	Organic solvents Meacham et al. (1997)	Steel canisters, triple sorbent traps, sorbent trap systems	Flammable gas, organic vapors, permanent gases

Note:

[1]Sasaki (1997)

B2.1.1 May 1997 Core Sample Handling

The core samples were shipped to the 222-S Laboratory for subsampling and analysis. Samples were assigned LABCORE numbers and were subjected to visual inspection for color, clarity, and solids content. The radiation dose rate on contact was also measured. The sludge slurry samples were divided into upper half and lower half segments. The material was homogenized and subsampled for laboratory analyses and archiving.

The SAP (Sasaki 1997) states that the core samples should be transported to the laboratory within three calendar days from the time each segment is removed from the tank. This requirement was not met for the segments from core 196.

The two core samples at the time of extrusion are described in Table B2-2.

Table B2-2. Tank 241-AW-105 Subsampling Scheme and Sample Description.[1] (2 sheets)

Sample ID	Core: Segment	Weight (g)	Solid/Liquid Recovered (g)	Sample Description
Core 195, Riser 10A				
195-04	195:4	87.2	Lower half	Collected 175 mL of drainable liquid that was yellow brown and opaque. Extruded 15.2 cm (6 in.) of solids that were yellow brown with the texture of sludge slurry. No organic layer was observed.
		173.5	Drainable liquid	
195-05	195:5	167.3	Lower half	No drainable liquid. Extruded 40.6 cm (16 in.) of solids that were white and yellow/brown with the texture of sludge slurry. Subsampled solids in half segments.
		162.4	Upper half	
195-06	195:6	215.7	Lower half	No drainable liquid. Extruded 45.7 cm (18 in.) of solids that were white with the texture of wet sludge. Subsampled solids in half segments.
		166.7	Upper half	
195-07	195:7	189.6	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids that were white with the texture of dry sludge. Subsampled solids in half segments.
		186.9	Upper half	
195-08	195:8	217.5	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids that were white with the texture of dry sludge. Subsampled solids in half segments.
		218.1	Upper half	
195-09	195:9	142.0	Lower half	No drainable liquid. Extruded 40.6 cm (16 in.) of solids that were white and black with the texture of dry sludge. Extruded solids in half segments.
		239.9	Upper half	
Field Blank	Field Blank		N/A	Collected 250 mL of clear, colorless liquid. No organic layer was observed.

Table B2-2. Tank 241-AW-105 Subsampling Scheme and Sample Description.[1] (2 sheets)

Sample ID	Core: Segment	Weight (g)	Solid/Liquid Recovered (g)	Sample Description
Core 196				
196-04	196:4	140.0	Lower half	Collected 150 mL of drainable liquid that was yellow-brown and opaque. Extruded 15.2 cm (6 in.) of solids that were yellow-brown with the texture of sludge slurry. No organic layer was observed.
		138.9	Drainable liquid	
196-05	196:5	164.3	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids that were white with the texture of wet sludge. The upper half contained small, black chunks. Subsampled in half segments.
		183.7	Upper half	
196-06	196:6	192.3	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids that were white with the texture of dry sludge. Solids were subsampled in half segments.
		188.3	Upper half	
196-07	196:7	175.0	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids that were white with the texture of dry sludge. Subsampled in half segments.
		145.3	Upper half	
196-08	196:8	189.8	Lower half	No drainable liquid. Extruded 48.3 cm (19 in.) of solids thatwere white with the texture of dry sludge. Subsampled solids in half segments.
		217.6	Upper half	
196-09	196:9	124.5	Lower half	No drainable liquid. Extruded 35.6 cm (14 in.) of solids that were black and white with the texture of dry sludge. The upper half was white, and the lower half was black. Solids were subsampled in half segments.
		143.3	Upper half	

Note:

N/A = not available

[1]Steen (1997)

B2.1.2 May 1997 Core Sample Analysis

The analyses performed on the core samples were limited to those required by the safety screening DQO and the waste compatibility DQO. The analyses required by the safety screening DQO included analyses for thermal properties by DSC, moisture content by TGA, content of fissile material by total alpha activity analysis, and bulk density. The safety screening DQO also required ICP and IC analyses for lithium and bromide to assess the potential for hydrostatic head fluid contamination. The analyses required by the waste compatibility DQO included safety parameters such as thermal properties by DSC, content of fissile material from $^{239/240}Pu$, specific gravity, and the concentration of several anions to assess corrosivity. Other ICP and IC analytes were also reported as "opportunistic" analytes (Sasaki 1997).

Differential scanning calorimetry and TGA were performed on 8.759 mg to 45.180 mg samples. Quality control tests included performing the analyses in duplicate and using standards.

Total alpha activity measurements were performed on samples that had been fused in a solution of potassium hydroxide and then dissolved in acid. The resulting solution was dried on a counting planchet and counted in an alpha proportional counter. Quality control tests included standards, spikes, blanks, and duplicate analyses.

Ion chromatography was performed on samples that had been prepared by water digestion. Quality control tests included standards, spikes, blanks, and duplicate analyses. The SAP required measuring the full suite of IC analytes.

Inductively coupled plasma spectroscopy was performed on samples that had been prepared by fusion digestion. Quality control tests included standards, blanks, spikes, and duplicate analyses. The SAP required analyzing the full suite of ICP elements.

All reported analyses were performed according to approved laboratory procedures (see Table B2-3). Table B2-4 is a summary of the sample portions, sample numbers, and analyses performed on each core sample.

Table B2-3. Tank 241-AW-105 May 1997 Core Sample Analytical Procedures.[1]

Analysis	Method	Procedure Number
Energetics	Differential scanning calorimetry	LA-514-114
Percent water	Thermogravimetric analysis	LA-514-114
Bulk density	Gravimetry	LO-160-103
Specific gravity	Gravimetry	LA-510-112
Anions by IC	Ion chromatography	LA-533-105
Metals by ICP/AES	Inductively coupled plasma spectrophotometry	LA-505-151 LA-505-161
TIC/TOC	Persulfate oxidation/coulometry	LA-342-100
TOC	Furnace oxidation/coulometry	LA-344-105
pH	Direct	LA-212-106
Alpha	Alpha proportional counter	LA-508-101
OH	Titration	LA-211-102
Ammonia	Ion selective electrode	LA-631-001
Radionuclides by GEA	Gamma energy analysis	LA-548-121
Plutonium- 239/240	Alpha proportional counter	LA-953-104
Amricium-241	Alpha proportional counter	LA-953-104
Strontium	Beta proportional counter	LA-220-101
Uranium	Kinetic phosphorescence	LA-925-009
Flammable gas	Combustible gas analyzer	WHC-IP-0030 IH 1.4 and IH 2.1[2]

Notes:

AES = atomic emission spectroscopy
GEA = gamma energy analysis

[1]Steen (1997)

[2]WHC (1992)

Table B2-4. Tank 241-AW-105 Sample Analysis Summary.[1] (3 sheets)

Riser	Sample ID	Sample Portion	Sample Number	Analyses
10A	Core 195 segment 4	Drainable liquid	S97T001112	Specific gravity, ICP, IC, TOC, DSC/TGA, alpha
			S97T001496	U, TIC/TOC, ^{90}Sr, $^{239/240}$Pu, pH, OH, NH_3, GEA, ^{241}Am
		Lower half	S97T001094	Bulk density
			S97T001106	TIC/TOC, pH, DSC/TGA
			S97T001174	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001185	OH, IC
10A	Core 195 segment 5	Upper half	S97T001101	TIC/TOC, pH, DSC/TGA
			S97T001169	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001180	OH, IC
		Lower half	S97T001095	Bulk density
			S97T001107	TIC/TOC, pH, DSC/TGA
			S97T001175	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001186	OH, IC
10A	Core 195 segment 6	Upper half	S97T001102	TIC/TOC, pH, DSC/TGA
			S97T001170	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001181	OH, IC
		Lower half	S97T001096	Bulk density
			S97T001108	TIC/TOC, pH, DSC/TGA
			S97T001176	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001187	OH, IC
10A	Core 195 segment 7	Upper half	S97T001103	TIC/TOC, pH, DSC/TGA
			S97T001171	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001182	OH, IC
		Lower half	S97T001097	Bulk density
			S97T001109	TIC/TOC, pH, DSC/TGA
			S97T001177	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001188	OH, IC

Table B2-4. Tank 241-AW-105 Sample Analysis Summary.[1] (3 sheets)

Riser	Sample ID	Sample Portion	Sample Number	Analyses
10A (Cont'd)	Core 195 segment 8	Upper half	S97T001104	TIC/TOC, pH, DSC/TGA
			S97T001172	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001183	OH, IC
		Lower half	S97T001098	Bulk density
			S97T001110	TIC/TOC, pH, DSC/TGA
			S97T001178	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001189	OH, IC
10A	Core 195 segment 9	Upper half	S97T001105	TIC/TOC, pH, DSC/TGA
			S97T001173	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001184	OH, IC
		Lower half	S97T001099	Bulk density
			S97T001111	TIC/TOC, pH, DSC/TGA
			S97T001179	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001190	OH, IC
12A	Core 196 segment 4	Drainable liquid	S97T001153	Specific gravity, ICP, IC, TOC, DSC/TGA, alpha
			S97T001498	U, ^{90}Sr, $^{239/240}$Pu, pH, OH direct, GEA
			S97T001806	TIC/TOC, NH_3, ^{241}Am
		Lower half	S97T001135	Bulk density
			S97T001147	TIC/TOC, pH, DSC/TGA
			S97T001219	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001230	OH, IC
12A	Core 196 segment 5	Upper half	S97T001142	TIC/TOC, pH, DSC/TGA
			S97T001214	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001225	OH, IC
		Lower half	S97T001136	Bulk density
			S97T001148	TIC/TOC, pH, DSC/TGA
			S97T001220	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001231	OH, IC

Table B2-4. Tank 241-AW-105 Sample Analysis Summary.[1] (3 sheets)

Riser	Sample ID	Sample Portion	Sample Number	Analyses
12A (Cont'd)	Core 196 segment 6	Upper half	S97T001143	TIC/TOC, pH, DSC/TGA
			S97T001215	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001226	OH, IC
		Lower half	S97T001137	Bulk density
			S97T001149	TIC/TOC, pH, DSC/TGA
			S97T001221	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001232	OH, IC
12A	Core 196 segment 7	Upper half	S97T001144	TIC/TOC, pH, DSC/TGA
			S97T001216	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001227	OH, IC
		Lower half	S97T001138	Bulk density
			S97T001150	TIC/TOC, pH, DSC/TGA
			S97T001222	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001233	OH, IC
12A	Core 196 segment 8	Upper half	S97T001145	TIC/TOC, pH, DSC/TGA
			S97T001217	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001228	OH, IC
		Lower half	S97T001139	Bulk density
			S97T001151	TIC/TOC, pH, DSC/TGA
			S97T001223	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001234	OH, IC
12A	Core 196 segment 9	Upper half	S97T001146	TIC/TOC, pH, DSC/TGA
			S97T001218	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, AEA
			S97T001229	OH, IC
		Lower half	S97T001140	Bulk density
			S97T001152	TIC/TOC, pH, DSC/TGA
			S97T001224	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA
			S97T001235	OH, IC
			S97T001752	U, ^{90}Sr, $^{239/240}$Pu, ICP, GEA, alpha, AEA

Notes:

AEA = alpha energy analysis

[1]Steen (1997)

B2.1.3 May 1997 Core Analytical Results

This section summarizes the sampling and analytical results associated with the May 1997 sampling and analysis of tank 241-AW-105. Table B2-5 shows the total alpha activity, percent water, energetics, IC, and ICP analytical results associated with this tank. These results are documented in Steen (1997).

Table B2-5. Analytical Tables.

Analysis	Table Number
Inductively coupled plasma/atomic emission spectroscopy	B2-12 through B2-48
Total uranium	B2-49 and B2-50
Ion chromatography	B2-51 through B2-58
Hydroxide	B2-59
NH_3 by ion selective electrode	B2-60
Total inorganic carbon	B2-61
Total organic carbon by persulfate	B2-62
Total organic carbon by furnace oxidation	B2-63
Gamma energy analysis	B2-64 through B2-68
^{241}Am	B2-69
$^{239/240}Pu$	B2-70
$^{89/90}Sr$	B2-71
Total alpha	B2-72
Energetics by differential scanning calorimetry	B2-73 and B2-74
Percent water by thermogravimetric analysis	B2-75
Bulk density	B2-76
Specific gravity	B2-77
pH	B2-78

The quality control (QC) parameters assessed in conjunction with tank 241-AW-105 samples were standard recoveries, spike recoveries, duplicate analyses (relative percent differences [RPDs]), and blanks. The QC criteria are specified in the SAP (Sasaki 1997). The limits for blanks are set forth in guidelines followed by the laboratory, and all data results in this report have met those guidelines. Sample and duplicate pairs, in which any QC parameter was outside these limits, are footnoted in the sample mean column of the following data summary tables with an a, b, c, d, e, or f as follows.

- "a" indicates that the standard recovery was below the QC limit.
- "b" indicates that the standard recovery was above the QC limit.
- "c" indicates that the spike recovery was below the QC limit.
- "d" indicates that the spike recovery was above the QC limit.
- "e" indicates that the RPD was greater than the QC limit range.
- "f" indicates that there was blank contamination.

In the analytical tables in this section, the "mean" is the average of the result and duplicate value. All values, including those below the detection level (denoted by "<") were averaged. If both sample and duplicate values were nondetected, or if one value was detected while the other was not, the mean is expressed as a nondetected value. If both values were detected, the mean is expressed as a detected value.

B2.1.3.1 Inductively Coupled Plasma. Analyses by ICP for the waste metallic constituents were performed in duplicate on all samples. The analyses were performed directly on the drainable liquid samples following an acid dilution. The centrifuged solid samples were analyzed following a fusion digestion. Although a full suite of analytes was reported, only aluminum, iron, and sodium were specifically requested by the waste compatibility DQO. Lithium was requested by the safety screening DQO to correct percent water measurements.

The primary ICP analytes detected were aluminum, iron, manganese, sodium, uranium, and zirconium. Lithium values were below detection levels, which suggests that hydrostatic head fluid contamination was not a problem.

B2.1.3.2 Total Uranium. The analyses for uranium were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion.

B2.1.3.3 Ion Chromatography (Ions). The analyses for IC were performed in duplicate on all samples. The analyses were performed directly on the drainable liquid samples. The centrifuged solid samples were analyzed following a water digestion. Although a full suite of analytes was reported, only chloride, fluoride, nitrate, nitrite, phosphate, and sulfate were specifically requested by the waste compatibility DQO. Bromide was requested by the safety screening DQO to correct percent water measurements.

Bromide values were below detection levels, which suggests that hydrostatic head fluid contamination was not a problem.

B2.1.3.4 Hydroxide. The analyses for hydroxide were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a water digestion. The concentration of free OH^- in the supernatant ranged from 6.36E+03 to 8.58E+03 μg/mL. The hydroxide results for the samples analyzed were all within the acceptable concentration ranges required for corrosion control.

B2.1.3.5 Ammonia. The analyses for ammonia were performed in duplicate directly on the drainable liquid samples. The highest result returned was 938 μg/mL.

B2.1.3.6 Total Inorganic Carbon. The analyses for TIC by persulfate/coulometry were performed in duplicate directly on all samples.

B2.1.3.7 Total Organic Carbon. The analyses for TOC by persulfate/coulometry were performed in duplicate directly on all samples. Two samples exceeded the TOC notification limit of 3 wt% (dry weight).

The analyses for TOC by furnace oxidation/coulometry were performed in duplicate directly on the drainable liquid samples. No result exceeded the TOC notification limit of 3 wt% (dry weight).

B2.1.3.8 Gamma Energy Analysis. The analyses by GEA for the radionuclide constituents were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion. Although a full suite of analytes was reported, only ^{137}Cs was specifically requested by the waste compatibility DQO.

B2.1.3.9 Americium-241. The analyses for ^{241}Am were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion.

B2.1.3.10 Plutonium-239/240. The analyses for $^{239/240}$Pu were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion. The results for the supernatant samples were below the lower criticality prevention limit of 6.2E-02 μCi/mL (0.001 g/L) stated in the waste compatibility DQO.

B2.1.3.11 Strontium-89/90. The analyses for $^{89/90}$Sr were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion.

B2.1.3.12 Total Alpha Activity. Analyses for total alpha activity were performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a fusion digestion. All liquid total alpha results were below the total alpha activity action limit of 61.5 μCi/mL. All solid total alpha results were below the total alpha activity action limit of 47.3 μCi/g. The highest results returned were 0.00184 μCi/mL for the liquid samples and 3.79 μCi/g for the solid samples.

B2.1.3.13 Differential Scanning Calorimetry. In a DSC analysis, heat absorbed or emitted by a substance is measured while the sample is heated at a constant rate. Nitrogen is passed over the sample material to remove any gases being released. The onset temperature for an endothermic or exothermic event is determined graphically. The analyses for exothermic energy by DSC was performed in duplicate directly on the centrifuged solid samples.

All DSC results were below the action limit of 480 J/g (dry weight); therefore, an upper limit of a 95 percent confidence interval on the mean for each sample was not calculated. Two samples, 195:7, upper half and 195:8, upper half, exhibited small exotherms of 2.65 and 1.13 J/g, respectively.

B2.1.3.14 Thermogravimetric Analysis. Thermogravimetric analysis measures the mass of a sample while its temperature is increased at a constant rate. Nitrogen is passed over the sample during heating to remove any released gases. Any decrease in the weight of a sample during TGA represents a loss of gaseous matter from the sample, either through evaporation or through a reaction that forms gas phase products. The moisture content is estimated by assuming that all TGA sample weight loss up to a certain temperature (typically 150 to 200 °C [302 to 392 °F]) is caused by water evaporation. The temperature limit for moisture loss is chosen by the operator at an inflection point on the TGA plot. Other volatile matter fractions can often be differentiated by inflection points as well.

The analyses for moisture content by TGA were performed in duplicate directly on all samples. The TGA results were determined by summing the weight loss steps that occurred below 250 °C (482 °F); weight loss steps above this temperature were not used to determine the result. The percent water for tank 241-AW-105 samples ranged from 48.6 to 92.2 percent by weight.

B2.1.3.15 Bulk Density, Specific Gravity, and pH. Bulk density was performed directly on the solid samples. The bulk density test result ranged from 1.17 to 1.43 g/mL.

The specific gravity of the waste is currently used to determine the potential for an accumulation of flammable gases. The flammable gas decision rule requires that the weighted mean specific gravity not exceed 1.41. Specific gravity analyses were performed in duplicate directly on the drainable liquid samples. The result of the specific gravity test was 1.07. This result does not exceed the 1.41 limit to allow waste transfer.

The pH analysis was performed in duplicate directly on the drainable liquid samples. The centrifuged solid samples were analyzed in duplicate following a water digestion. The pH results ranged from 11.6 to 13.2. Results for pH that are greater than 12.5 are suspect and should be considered estimates because the highest calibration buffer is 12.5, and pH electrode performance degrades at high pH.

B2.2 1996 GRAB SAMPLING EVENT

On August 20 and 21, 1996, 20 grab samples were collected from tank 241-AW-105. Samples 5AW-96-1 through 5AW-96-9 were removed from riser 10A, and samples 5AW-96-10 through 5AW-96-20 were removed from riser 15A. All samples were received at the Westinghouse Hanford Company 222-S Laboratory between August 21 and August 27, 1996 (Esch 1997). Analyses were performed on only 12 of the 20 samples as directed by the sampling and analysis plan (Sasaki 1996). The remaining eight samples are being held at the 222-S Laboratory for use in K-Basin sludge mixing/compatibility studies.

B2.2.1 August 1996 Grab Sample Handling

Table B2-6 lists the sampling dates, the dates the samples were received by the 222-S Laboratory, the actual sampling elevation, percent solids settled, and sample appearance. Although only 12 samples were analyzed, all 20 samples collected are included in the table.

Table B2-6. Tank 241-AW-105 August 1996 Grab Sample Description.[1] (3 sheets)

Segment Number	Date Sampled[2]	Date Received[2]	Actual Elevation cm (in.)[3]	% Settled Solids	Sample Description
5AW-96-1	8/20/96	8/26/96	394 (155)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.
5AW-96-2	8/20/96	8/27/96	348 (137)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.
5AW-96-3	8/20/96	8/21/96	348 (137)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-4	8/20/96	8/27/96	300 (118)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.

Table B2-6. Tank 241-AW-105 August 1996 Grab Sample Description.[1] (3 sheets)

Segment Number	Date Sampled[2]	Date Received[2]	Actual Elevation cm (in.)[3]	% Settled Solids	Sample Description
5AW-96-5	8/20/96	8/27/96	241 (95)	~22%	Clear yellow liquid with approximately 22% settled solids. Solids were a yellow, soft sludge material with some small, black particulates.
5AW-96-6	8/20/96	8/26/96	198 (78)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-7	8/20/96	8/26/96	198 (78)	~90%	Liquid color was indistinguishable. Solids were a yellow/gray, soft sludge material with some small, black particulates.
5AW-96-8	8/20/96	8/21/96	198 (78)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-9	8/20/96	8/27/96	196 (77)	~90%	Liquid color was indistinguishable. Solids were a nonhomogeneous mixture of light yellow and gray, soft sludge material with some small, black particulates.
5AW-96-10	8/21/96	8/22/96	394 (155)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.
5AW-96-11	8/21/96	8/22/96	348 (137)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.
5AW-96-12	8/21/96	8/23/96	348 (137)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-13	8/21/96	8/23/96	348 (137)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-14	8/21/96	8/23/96	300 (118)	Trace	Clear yellow liquid, no organic layer, trace amount of solids.
5AW-96-15	8/21/96	8/23/96	241 (95)	~90%	Liquid color was indistinguishable. Solids were a nonhomogeneous mixture of dark yellow and gray, soft sludge material with some small, black particulates.

Table B2-6. Tank 241-AW-105 August 1996 Grab Sample Description.[1] (3 sheets)

Segment Number	Date Sampled[2]	Date Received[2]	Actual Elevation cm (in.)[3]	% Settled Solids	Sample Description
5AW-96-16	8/21/96	8/23/96	185 (73)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-17	8/21/96	8/23/96	185 (73)	~90%	Liquid color was indistinguishable. Solids were a nonhomogeneous mixture composed mostly of dark gray/black, soft sludge material with some yellow sludge swirled throughout.
5AW-96-18	8/21/96	8/23/96	185 (73)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-19	8/21/96	8/23/96	185 (73)	N/A	Sample designated for K Basin sludge mixing studies.
5AW-96-20	8/21/96	8/26/96	168 (66)	~93%	Liquid color was indistinguishable. Solids were a nonhomogeneous mixture composed mostly of a somewhat even mixture of yellow and gray, soft sludge material swirled together. There were some larger chunks of material scattered throughout, some black and some nearly white.

Notes:

[1]Esch (1997)

[2]Dates are provided in the mm/dd/yy format.

[3]Actual elevation was the distance (in.) from the tank bottom to the mouth of the sample bottle.

B2.2.2 August 1996 Grab Sample Analysis

All analyses required by the waste compatibility DQO were performed on the grab samples. In addition to the analyses requested in the SAP, many ICP analytes, as well as bromide, oxalate, and ^{60}Co, were obtained on an opportunistic basis. These analytes were reported in accordance with Kristofzski (1995) because doing so required little additional effort. The analyses required by the waste compatibility DQO included safety parameters such as thermal properties by DSC, content of fissile material from $^{239/240}Pu$, specific gravity, and the concentrations of several anions to assess corrosivity.

The six supernatant samples and the interstitial liquid portions from the sludge samples were all analyzed on the direct samples; the ICP analytes were first subjected to an acid dilution. The six centrifuged solid samples were analyzed directly for bulk density, DSC, TGA, TIC, TOC, pH, and polychlorinated biphenyls. The anions and hydroxide were analyzed following a water digestion, and the ICP analytes and radionuclides were analyzed following a fusion digestion.

All analyses were performed at the 222-S Laboratory, and were conducted in accordance with approved laboratory procedures. Table B2-7 is a summary of the sample numbers and applicable analyses performed on each grab sample.

Table B2-7. Tank 241-AW-105 August 1996 Sample Analysis Summary.[1] (3 sheets)

Riser	Segment Number	Sample Portion	Sample Number[2]	Analyses
10A	5AW-96-1	Supernatant	5004	DSC, TGA, specific gravity, pH, TIC, TOC, ICP, IC, OH^-
			5007	^{241}Am, $^{239/240}Pu$, $^{89/90}Sr$, GEA, total alpha
	5AW-96-2	Supernatant	5005	DSC, TGA, pH, ICP
			5008	Specific gravity, TIC, TOC, IC, OH^-, ^{241}Am, $^{239/240}Pu$, $^{89/90}Sr$, GEA, total alpha
	5AW-96-4	Supernatant	5006	DSC, TGA, specific gravity, pH, TIC, TOC, ICP, IC, OH^-
			5009	^{241}Am, $^{239/240}Pu$, $^{89/90}Sr$, GEA, total alpha
	5AW-96-5	Centrifuged solids	5019	DSC, TGA, bulk density, pH, TIC, TOC
			5052	ICP, ^{241}Am, $^{239/240}Pu$, $^{89/90}Sr$, GEA, total alpha
			5055	IC, OH^-
			5046	PCBs
		Centrifuged liquids	5049	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}Pu$, $^{89/90}Sr$, GEA, total alpha
		Sludge	4809	Bulk density, volume percent solids

Table B2-7. Tank 241-AW-105 August 1996 Sample Analysis Summary.[1] (3 sheets)

Riser	Segment Number	Sample Portion	Sample Number[2]	Analyses
10A (Cont'd)	5AW-96-7	Centrifuged solids	5020	DSC, TGA, bulk density, pH, TIC, TOC
			5053	ICP, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
			5056	IC, OH^-
			5047	PCBs
		Centrifuged liquids	5050	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
		Sludge	4811	Bulk density, volume percent solids
	5AW-96-9	Centrifuged solids	5021	DSC, TGA, bulk density, pH, TIC, TOC
			5054	ICP, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
			5057	IC, OH^-
			5048	PCBs
		Centrifuged liquids	5051	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
		Sludge	4813	Bulk density, volume percent solids
15A	5AW-96-10	Supernatant	5010	DSC, TGA, specific gravity, pH, TIC, TOC, ICP, IC, OH^-
			5013	^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
	5AW-96-11	Supernatant	5011	DSC, TGA, specific gravity, pH, TIC, TOC, ICP, IC, OH^-
			5014	^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
	5AW-96-14	Supernatant	5012	DSC, TGA, specific gravity, pH, TIC, TOC, ICP, IC, OH^-
			5015	^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha

Table B2-7. Tank 241-AW-105 August 1996 Sample Analysis Summary.[1] (3 sheets)

Riser	Segment Number	Sample Portion	Sample Number[2]	Analyses
15A (Cont'd)	5AW-96-15	Centrifuged solids	5075	DSC, TGA, bulk density, pH, TIC, TOC
			5084	ICP, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
			5087	IC, OH^-
			5078	PCBs
		Centrifuged liquids	5081	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
		Sludge	4819	Bulk density, volume percent solids
	5AW-96-17	Centrifuged solids	5076	DSC, TGA, bulk density, pH, TIC, TOC
			5085	ICP, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
			5088	IC, OH^-
			5079	PCBs
		Centrifuged liquids	5082	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
		Sludge	4821	Bulk density, volume percent solids
	5AW-96-20	Centrifuged solids	5077	DSC, TGA, bulk density, pH, TIC, TOC
			5086	ICP, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
			5089	IC, OH^-
			5080	PCBs
		Centrifuged liquids	5083	DSC, TGA, bulk density, pH, TIC, TOC, ICP, IC, OH^-, ^{241}Am, $^{239/240}$Pu, $^{89/90}$Sr, GEA, total alpha
		Sludge	4824	Bulk density, volume percent solids

Notes:

[1]Esch (1997)

[2]Sample numbers start with S96T00.

B2.2.3 August 1996 Grab Analytical Results

This section summarizes the sampling and analytical results associated with the August 1996 sampling and analysis of tank 241-AW-105.

The six supernatant samples and the interstitial liquid portions from the sludge samples were analyzed on the direct samples; the ICP analytes were first subjected to an acid dilution. The six centrifuged solid samples were analyzed directly for bulk density, DSC, TGA, TIC, TOC, pH, and polychlorinated biphenyls (PCBs). The anions and hydroxide were analyzed following a water digestion, and the ICP analytes and radionuclides were analyzed following a fusion digestion.

Table B2-8 gives sludge separation information for the sludge samples from tank 241-AW-105 that were analyzed.

Table B2-8. Sludge Separation Information for Tank 241-AW-105 August 1996 Grab Samples.[1]

Segment Number	Supernatant Removed		Centrifuged Solids		Interstitial Liquid	
	Weight (g)	Volume (mL)	Weight (g)	Volume (mL)	Weight (g)	Volume (mL)
5AW-96-5	106.26	101.0	10.34	9.0	17.60	17.0
5AW-96-7	3.73	3.5	118.63	89.5	40.86	39.0
5AW-96-9	9.16	8.0	115.85	89.5	32.88	32.0
5AW-96-15	27.20	25.3	100.11	79.5	28.45	29.0
5AW-96-17	10.60	9.5	108.22	82.5	41.28	39.5
5AW-96-20	18.27	17.0	119.14	94.5	27.2	25.0

Note:
[1]Esch (1997)

The tank 241-AW-105 August 1996 grab sampling event results are given in Tables B2-80 through B2-125. In each data table, the "Sample Elevation" column refers to the distance from the tank bottom to the mouth of the sample bottle. The "Mean" column is the average of the result and duplicate values. All values, including those below the detection level (denoted by the less-than symbol, "<"), were averaged. If both sample and duplicate values were nondetected, the mean is expressed as a nondetected value. If one value was detected and the other was not, the mean is also expressed as a nondetected value. If both values were detected, the mean is expressed as a detected value. For those analytes in which all data results from all waste phases were nondetected, each individual nondetected value is not listed in a separate data table. Instead, Table B2-79 lists these analytes along with their single highest nondetected value. These results are documented in *Tank 241-AW-105, Grab Samples, 5AW-96-1 through 5AW-96-20 Analytical Results for the Final Report* (Esch 1997). Tables B2-126 through B2-130 present the estimated solid and liquid concentrations based on the analytical results.

Because of QC questions with the TOC analysis, replicates were conducted on the supernatant sample 5AW-96-2 and on the centrifuged liquid sample 5AW-96-5. Three of the supernatant samples exceeded the waste compatibility notification limit of 30,000 μg C/mL. The largest sample mean was 100,000 μg C/mL on a dry weight basis from sample 5AW-96-1.

The results from this sampling event represent the current supernatant contents. The transfer history indicates the liquid layer's composition has remained relatively unchanged since this sampling event, with just a slight decrease in volume.

B2.3 VAPOR PHASE MEASUREMENT

Before the May 1997 core sampling of tank 241-AW-105, a tank headspace vapor phase measurement was taken from riser 15A. Additional measurements were obtained from risers 10A and 15A before the August 1996 grab sampling. These measurements supported the hazardous vapor safety screening DQO (Dukelow et al. 1995), and were taken to resolve flammable gas issues. The vapor phase measurements were taken at elevations 6.1 m (20 ft) below the riser in the tank headspace. The results of these measurements are provided in Table B2-9. All flammability measurements indicated that the gases in the tank headspace were ≤ 1 percent of the LFL.

Table B2-9. Results of Tank 241-AW-105 Headspace Measurements.

Measurement	Riser 10A August 20, 1996	Riser 15A August 20, 1996	Riser 15A May 13, 1997
Total organic carbon	10.8 ppmv	10.1 ppmv	0 ppmv
Lower flammability limit	0.0% of LFL	1.0% of LFL	0.0% of LFL
Oxygen	21.0%	20.8%	20.98%
Ammonia	100 ppmv	100 ppmv	45 ppmv

B2.4 DESCRIPTION OF HISTORICAL SAMPLING EVENTS

There were several previous sampling events for tank 241-AW-105, of which two supernatant sampling events should be noted. Separable organic layers were reported in surface samples taken from tank 241-AW-105 in 1984 and in January 1985 (Jansky 1984 and Mauss 1985). The 1984 surface sample was reported to be 65 volume percent separable organic; the organic layer was determined to be 27.5 volume percent tributyl phosphate (Jansky 1984). The January 1985 surface sample consisted of 2 volume percent separable organic; the organic layer was determined to be approximately 30 percent tributyl phosphate and 70 percent normal paraffin hydrocarbons (Mauss 1985). Because the supernatant in tank 241-AW-105 has been pumped out and replaced seven times since the January 1985 sampling event, and the pumping of liquids from the tank is through a pump that removes liquid from the waste surface, the organic layer should no longer exist in the tank. No separable organics have been reported in subsequent sampling events.

Four prior sludge sampling events represent the sludge contents and are discussed below starting with the earliest relevant sampling event. The transfer history indicates that the composition of this solids layer has remained relatively unchanged since the first of these historical sludge sampling events, with just a slight increase in volume. Pre-1989 analytical data have not been validated and should be used with caution.

B2.4.1 Description of Early 1986 Grab Sampling Event

Five samples of waste from tank 241-AW-105 were received by Pacific Northwest Laboratory in early 1986. The exact date of the sampling event was not given in the report, which was issued on May 1, 1986. The objective of the sampling event was to compare the properties of a sample of NCRW with those available for simulated NCRW (McCarthy et al. 1986) and from the Zirflex decladding sludge flowsheet (Tulberg 1983). Four samples were described as very thick sludges, and the fifth was a relatively clear liquid. Before chemical analysis, the sludges were transferred to a single container. The liquid was used to make the solids more fluid to allow transfer and to rinse the shipping containers. This NCRW sludge composite was mustard yellow and appeared to be a homogeneous paste having the consistency of thick pudding (Scheele and McCarthy 1986). No information regarding sampling location, depth, or other sampling parameters was provided. The analytical results of this sampling event are presented in Table B2-131.

B2.4.2 Description of July 1986 Core Sampling Event

A core sample consisting of ten segments was obtained on July 2, 1986, from riser 13A of tank 241-AW-105. The major purpose in sampling the tank was to determine whether the solids material stored in it could be classified as transuranic or nontransuranic. The operational field data from this event are presented in Table B2-10.

The first three segments contained only supernatant (which was discarded), and the fourth segment was found to be empty. The fifth segment contained only 5.8 cm (2 in.) of white NCRW solids, and the remainder was supernatant. Segments six through nine contained white NCRW solids. The solids bulk density increased at lower depths in the tank, and the solids from segment nine had the consistency of toothpaste. Segment 10 contained approximately 30.5 cm (12 in.) of black, grainy solids at the bottom, and the remainder was white NCRW solids. The black material, the "heel," is assumed to consist of PUREX miscellaneous waste (PXMSC) solids (Peters 1986). The results of this sampling event are presented in Table B2-132.

Table B2-10. Field Data from the Tank 241-AW-105 July 1986 Historical Sludge Sampling Event.[1]

Segment Number	Distance from Tank Bottom to Segment Bottom	Dose Rate Through Drill String
	(in.)	(mrad/hr)
1	168.75	180
2	149.75	190
3	130.75	210
4	111.75	5
5	92.75	200
6	73.75	4,200
7	54.75	300
8	35.75	900
9	16.75	360
10	0.00	750

Note:

[1]Vail (1986)

B2.4.3 Description of September 1986 Core Sampling Event

A core sample consisting of six segments was obtained in September 1986 from riser 15A of tank 241-AW-105. The samples extended from just above the sludge surface to the tank bottom. Segment 2 was described as mostly supernatant with 5.8 cm (2 in.) of white solids. Segments 3, 4, and 5 were all described as white solids, and segment 6 consisted of 30.5 cm (12 in.) of black solids with a remainder of white solids (Brevick et al. 1997). No further detail regarding the sampling event was given. The results of this sampling event are presented in Table B2-133.

B2.4.4 Description of May 1990 Core Sampling Event

Seven core sample segments were collected from May 14 through 17, 1990, from riser 16B, with a core sampling truck. A stainless steel sampler was used to obtain a 48-cm (19-in.)-long and 2.5-cm (1-in.)-diameter core of waste (maximum volume of 187 mL). At the time of this sampling event, tank 241-AW-105 contained about 8.33 m (328 in.) of waste, of which approximately 2.74 m (108 in.) was sludge and 5.59 m (220 in.) was supernatant. Waste from above the sludge surface to the tank bottom was sampled. Sample segments 1 and 2 consisted entirely of supernatant, and segments 3 through 7 were taken from the sludge layer and contained no drainable liquids (Tingey and Simpson 1994). The extrusion information is listed in Table B2-11. The results of this sampling event are presented in Tables B2-134 through B2-137.

Table B2-11. Tank 241-AW-105 May 1990 Core 19 Sample Description.[1] (2 sheets)

Core	Seg.	Sample ID	Percent Recovery	Sample Recovered[2] (cm)	Sample Amount		Sample Description
					Drainable Liquid (mL)	Solid (g)	
19	1	90-014	80	39	205	0.00	No solids were observed.
	2	90-015	96	46	245	0.00	No solids were observed.
	3	90-016	92	44	0.00	294	The segment's top 28 cm (11 in.) appeared as a gray slurry that could not hold its shape, and the bottom portion retained its shape. Progressing down the segment, the color became lighter until it was white at 28 cm (11 in.) from the top. No free liquids were observed.
	4	90-017	98	47	0.00	314	Solids were a white sludge, similar to the bottom of segment 3. No free liquids were observed.
	5	90-018	93	45	0.00	307	Solids were white, with the exception of some brown and black spots. The material was dry and broke off into chunks as it was extruded. No free liquids were observed.

Table B2-11. Tank 241-AW-105 May 1990 Core 19 Sample Description.[1] (2 sheets)

Core	Seg.	Sample ID	Percent Recovery	Sample Recovered[2] (cm)	Sample Amount: Drainable Liquid (mL)	Sample Amount: Solid (g)	Sample Description
19 (Cont'd)	6	90-019	95	46	0.00	323	The top ~18 cm (~7 in.) were similar to segment 5, a dry white material with streaks of brown. The bottom ~30 cm (~12 in.) were grayish white and had a margarine-like consistency. No free liquids were observed.
	7	90-020	34	17	0.00	122	The solids were harder than in the previous segments. They were very dark in color with white marbling in the top 10 cm (4 in.). No free liquids were observed.

Notes:

[1]Tingey and Simpson (1994)

[2]Calculated from amount of liquid and solid recovered.

1997 PUSH CORE DATA TABLES

Table B2-12. Tank 241-AW-105 Analytical Results: Aluminum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	1,440	1,510	1,480
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	1,960	1,940	1,950
S97T001178		Lower half	2,040	2,390	2,220
S97T001173	195:9	Upper half	3,840	4,050	3,950
S97T001179		Lower half	13,300	10,400	11,900[QC:e]
S97T001219	196:4	Lower half	1,070	1,300	1,190
S97T001214	196:5	Upper half	2,320	2,390	2,360
S97T001220		Lower half	<1,060	1,170	<1,120
S97T001215	196:6	Upper half	1,400	1,260	1,330
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	1,490	1,330	1,410
S97T001222		Lower half	<1,040	1,060	<1,050
S97T001217	196:8	Upper half	2,620	2,780	2,700
S97T001223		Lower half	2,130	2,220	2,180
S97T001218	196:9	Upper half	5,610	5,540	5,580
S97T001224		Lower half	11,600	8,270	9,940[QC:e]
S97T001752		Lower half	14,800	14,500	14,700
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	238	234	236
S97T001153	196:4	Drainable liquid	196	197	197

Table B2-13. Tank 241-AW-105 Analytical Results: Antimony (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,300	<1,240	<1,270
S97T001169	195:5	Upper half	1,940	<1,190	<1,570[QC:e]
S97T001175		Lower half	<1,280	<1,270	<1,280
S97T001170	195:6	Upper half	<1,220	1,290	<1,260
S97T001176		Lower half	<1,200	<1,180	<1,190
S97T001171	195:7	Upper half	<1,210	<1,220	<1,220
S97T001177		Lower half	<1,210	<1,210	<1,210
S97T001172	195:8	Upper half	<1,200	<1,190	<1,200
S97T001178		Lower half	<1,220	<1,180	<1,200
S97T001173	195:9	Upper half	<1,210	<1,210	<1,210
S97T001179		Lower half	2,110	<1,320	<1,720[QC:e]
S97T001219	196:4	Lower half	<1,270	<1,220	<1,250
S97T001214	196:5	Upper half	<1,180	<1,180	<1,180
S97T001220		Lower half	<1,280	<1,270	<1,280
S97T001215	196:6	Upper half	<1,150	<1,160	<1,160
S97T001221		Lower half	<1,210	<1,180	<1,200
S97T001216	196:7	Upper half	<1,140	<1,150	<1,150
S97T001222		Lower half	<1,250	<1,220	<1,240
S97T001217	196:8	Upper half	<1,210	<1,170	<1,190
S97T001223		Lower half	<1,210	<1,150	<1,180
S97T001218	196:9	Upper half	<1,200	<1,180	<1,190
S97T001224		Lower half	<1,320	<1,260	<1,290
S97T001752		Lower half	<1,190	<1,170	<1,180
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<12.1	<12.1	<12.1
S97T001153	196:4	Drainable liquid	<6.06	<6.06	<6.06

Table B2-14. Tank 241-AW-105 Analytical Results: Arsenic (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-15. Tank 241-AW-105 Analytical Results: Barium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	<994	<989	<992
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	<998	<991	<995
S97T001178		Lower half	<1,020	<983	<1,000
S97T001173	195:9	Upper half	<1,010	<1,010	<1,010
S97T001179		Lower half	<1,060	<1,100	<1,080
S97T001219	196:4	Lower half	<1,060	<1,010	<1,040
S97T001214	196:5	Upper half	<985	<983	<984
S97T001220		Lower half	<1,060	<1,060	<1,060
S97T001215	196:6	Upper half	<960	<964	<962
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	<949	<960	<955
S97T001222		Lower half	<1,040	<1,020	<1,030
S97T001217	196:8	Upper half	<1,010	<977	<994
S97T001223		Lower half	<1,000	<962	<981
S97T001218	196:9	Upper half	<997	<987	<992
S97T001224		Lower half	<1,100	<1,050	<1,080
S97T001752		Lower half	<994	<975	<985
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<10.1	<10.1	<10.1
S97T001153	196:4	Drainable liquid	<5.05	<5.05	<5.05

Table B2-16. Tank 241-AW-105 Analytical Results: Beryllium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<108	<103	<106
S97T001169	195:5	Upper half	<99.4	<98.9	<99.2
S97T001175		Lower half	<106	<106	<106
S97T001170	195:6	Upper half	<101	<99.6	<100
S97T001176		Lower half	<100	<98.7	<99.3
S97T001171	195:7	Upper half	<100	<101	<101
S97T001177		Lower half	<101	<101	<101
S97T001172	195:8	Upper half	<99.8	<99.1	<99.4
S97T001178		Lower half	<102	<98.3	<100
S97T001173	195:9	Upper half	<101	<101	<101
S97T001179		Lower half	<106	<110	<108
S97T001219	196:4	Lower half	<106	<101	<104
S97T001214	196:5	Upper half	<98.5	<98.3	<98.4
S97T001220		Lower half	<106	<106	<106
S97T001215	196:6	Upper half	<96	<96.4	<96.2
S97T001221		Lower half	<101	<98	<99.5
S97T001216	196:7	Upper half	<94.9	<96	<95.5
S97T001222		Lower half	<104	<102	<103
S97T001217	196:8	Upper half	<101	<97.7	<99.3
S97T001223		Lower half	<100	<96.2	<98.1
S97T001218	196:9	Upper half	<99.7	<98.7	<99.2
S97T001224		Lower half	<110	<105	<108
S97T001752		Lower half	<99.4	<97.5	<98.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<1.01	<1.01	<1.01
S97T001153	196:4	Drainable liquid	<0.505	<0.505	<0.505

Table B2-17. Tank 241-AW-105 Analytical Results: Bismuth (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-18. Tank 241-AW-105 Analytical Results: Boron (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	<994	<989	<992
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	<998	<991	<995
S97T001178		Lower half	<1,020	<983	<1,000
S97T001173	195:9	Upper half	<1,010	<1,010	<1,010
S97T001179		Lower half	<1,060	<1,100	<1,080
S97T001219	196:4	Lower half	<1,060	<1,010	<1,040
S97T001214	196:5	Upper half	<985	<983	<984
S97T001220		Lower half	<1,060	<1,060	<1,060
S97T001215	196:6	Upper half	<960	<964	<962
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	<949	<960	<955
S97T001222		Lower half	<1,040	<1,020	<1,030
S97T001217	196:8	Upper half	<1,010	<977	<994
S97T001223		Lower half	<1,000	<962	<981
S97T001218	196:9	Upper half	<997	<987	<992
S97T001224		Lower half	<1,100	<1,050	<1,080
S97T001752		Lower half	<994	<975	<985
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<10.1	<10.1	<10.1
S97T001153	196:4	Drainable liquid	5.79	5.59	5.69

Table B2-19. Tank 241-AW-105 Analytical Results: Cadmium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<108	121	<115
S97T001169	195:5	Upper half	324	331	328
S97T001175		Lower half	<106	<106	<106
S97T001170	195:6	Upper half	<101	<99.6	<100
S97T001176		Lower half	<100	<98.7	<99.3
S97T001171	195:7	Upper half	<100	<101	<101
S97T001177		Lower half	<101	<101	<101
S97T001172	195:8	Upper half	<99.8	<99.1	<99.4
S97T001178		Lower half	<102	<98.3	<100
S97T001173	195:9	Upper half	123	125	124
S97T001179		Lower half	106	112	109
S97T001219	196:4	Lower half	431	407	419
S97T001214	196:5	Upper half	<98.5	<98.3	<98.4
S97T001220		Lower half	<106	<106	<106
S97T001215	196:6	Upper half	<96	<96.4	<96.2
S97T001221		Lower half	<101	<98	<99.5
S97T001216	196:7	Upper half	<94.9	<96	<95.5
S97T001222		Lower half	<104	<102	<103
S97T001217	196:8	Upper half	<101	<97.7	<99.3
S97T001223		Lower half	<100	<96.2	<98.1
S97T001218	196:9	Upper half	<99.7	<98.7	<99.2
S97T001224		Lower half	<110	<105	<108
S97T001752		Lower half	<99.4	<97.5	<98.5
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	1.01	<1.01	<1.01
S97T001153	196:4	Drainable liquid	0.745	0.968	0.857[QC:e]

Table B2-20. Tank 241-AW-105 Analytical Results: Calcium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	3,110	3,620	3,370
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	6,330	6,950	6,640
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	3,090	2,540	2,820
S97T001224		Lower half	4,390	2,500	3,450[QC:e]
S97T001752		Lower half	5,040	4,390	4,720
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	97	<20.1	<58.5[QC:c,e]
S97T001153	196:4	Drainable liquid	22.1	28.2	25.1[QC:e]

Table B2-21. Tank 241-AW-105 Analytical Results: Cerium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-22. Tank 241-AW-105 Analytical Results: Chromium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	436	<207	<322[QC:e]
S97T001169	195:5	Upper half	623	699	661
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	8,080	9,050	8,570
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	749	755	752
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	<199	<197	<198
S97T001224		Lower half	6,940	4,620	5,780[QC:e]
S97T001752		Lower half	7,700	7,380	7,540
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	8.44	7.39	7.91
S97T001153	196:4	Drainable liquid	6.48	6.51	6.5

Table B2-23. Tank 241-AW-105 Analytical Results: Cobalt (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	498	<414	<456
S97T001169	195:5	Upper half	<398	<396	<397
S97T001175		Lower half	<425	<422	<424
S97T001170	195:6	Upper half	<405	<398	<402
S97T001176		Lower half	<401	<395	<398
S97T001171	195:7	Upper half	<402	<405	<404
S97T001177		Lower half	<402	<403	<403
S97T001172	195:8	Upper half	<399	<396	<398
S97T001178		Lower half	<407	<393	<400
S97T001173	195:9	Upper half	<403	<405	<404
S97T001179		Lower half	<423	<440	<432
S97T001219	196:4	Lower half	<424	<406	<415
S97T001214	196:5	Upper half	<394	<393	<394
S97T001220		Lower half	<426	<424	<425
S97T001215	196:6	Upper half	<384	<385	<385
S97T001221		Lower half	<403	<392	<398
S97T001216	196:7	Upper half	<379	<384	<382
S97T001222		Lower half	<417	<407	<412
S97T001217	196:8	Upper half	<404	<391	<398
S97T001223		Lower half	<402	<385	<394
S97T001218	196:9	Upper half	<399	<395	<397
S97T001224		Lower half	<442	<421	<432
S97T001752		Lower half	<398	<390	<394
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	5.47	5.5	5.48
S97T001153	196:4	Drainable liquid	<2.02	<2.02	<2.02

Table B2-24. Tank 241-AW-105 Analytical Results: Copper (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	<212	<220	<216
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	<197	<197	<197
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	<199	<197	<198
S97T001224		Lower half	<221	<211	<216
S97T001752		Lower half	<199	<195	<197
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	<1.01	<1.01	<1.01

Table B2-25. Tank 241-AW-105 Analytical Results: Iron (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	< 1,080	1,340	< 1,210[QC:e]
S97T001169	195:5	Upper half	4,300	4,540	4,420
S97T001175		Lower half	< 1,060	< 1,060	< 1,060
S97T001170	195:6	Upper half	< 1,010	< 996	< 1,000
S97T001176		Lower half	< 1,000	< 987	< 994
S97T001171	195:7	Upper half	< 1,000	< 1,010	< 1,010
S97T001177		Lower half	< 1,010	< 1,010	< 1,010
S97T001172	195:8	Upper half	< 998	< 991	< 995
S97T001178		Lower half	< 1,020	< 983	< 1,000
S97T001173	195:9	Upper half	< 1,010	< 1,010	< 1,010
S97T001179		Lower half	21,400	22,200	21,800
S97T001219	196:4	Lower half	< 1,060	< 1,010	< 1,040
S97T001214	196:5	Upper half	3,920	17,800	10,900[QC:e]
S97T001220		Lower half	< 1,060	< 1,060	< 1,060
S97T001215	196:6	Upper half	< 960	< 964	< 962
S97T001221		Lower half	< 1,010	< 980	< 995
S97T001216	196:7	Upper half	< 949	< 960	< 955
S97T001222		Lower half	< 1,040	< 1,020	< 1,030
S97T001217	196:8	Upper half	< 1,010	< 977	< 994
S97T001223		Lower half	< 1,000	< 962	< 981
S97T001218	196:9	Upper half	1,610	1,470	1,540
S97T001224		Lower half	16,400	8,960	12,700[QC:e]
S97T001752		Lower half	17,500	18,400	18,000
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	< 10.1	< 10.1	< 10.1
S97T001153	196:4	Drainable liquid	< 5.05	< 5.05	< 5.05

Table B2-26. Tank 241-AW-105 Analytical Results: Lanthanum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	1,020	1,070	1,050
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	<998	<991	<995
S97T001178		Lower half	<1,020	<983	<1,000
S97T001173	195:9	Upper half	<1,010	<1,010	<1,010
S97T001179		Lower half	<1,060	<1,100	<1,080
S97T001219	196:4	Lower half	<1,060	<1,010	<1,040
S97T001214	196:5	Upper half	2,640	2,650	2,650
S97T001220		Lower half	<1,060	<1,060	<1,060
S97T001215	196:6	Upper half	<960	<964	<962
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	1,110	1,080	1,100
S97T001222		Lower half	<1,040	<1,020	<1,030
S97T001217	196:8	Upper half	<1,010	<977	<994
S97T001223		Lower half	<1,000	<962	<981
S97T001218	196:9	Upper half	<997	<987	<992
S97T001224		Lower half	<1,100	<1,050	<1,080
S97T001752		Lower half	<994	<975	<985
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<10.1	<10.1	<10.1
S97T001153	196:4	Drainable liquid	<5.05	<5.05	<5.05

Table B2-27. Tank 241-AW-105 Analytical Results: Lead (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	2,530	<2,070	<2,300
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-28. Tank 241-AW-105 Analytical Results: Lithium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	<212	<220	<216
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	<197	<197	<197
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	<199	<197	<198
S97T001224		Lower half	<221	<211	<216
S97T001752		Lower half	<199	<195	<197
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	<1.01	<1.01	<1.01

Table B2-29. Tank 241-AW-105 Analytical Results: Magnesium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-30. Tank 241-AW-105 Analytical Results: Manganese (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	432	481	457
S97T001169	195:5	Upper half	3,840	3,770	3,810
S97T001175		Lower half	274	299	287
S97T001170	195:6	Upper half	214	<199	<207
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	746	655	701
S97T001179		Lower half	15,900	17,800	16,900
S97T001219	196:4	Lower half	353	325	339
S97T001214	196:5	Upper half	3,270	3,490	3,380
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	2,970	2,640	2,810
S97T001224		Lower half	10,300	6,060	8,180[QC:e]
S97T001752		Lower half	12,500	11,200	11,900
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	<1.01	<1.01	<1.01

Table B2-31. Tank 241-AW-105 Analytical Results: Molybdenum (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	<994	<989	<992
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	<998	<991	<995
S97T001178		Lower half	<1,020	<983	<1,000
S97T001173	195:9	Upper half	<1,010	<1,010	<1,010
S97T001179		Lower half	<1,060	<1,100	<1,080
S97T001219	196:4	Lower half	<1,060	<1,010	<1,040
S97T001214	196:5	Upper half	<985	<983	<984
S97T001220		Lower half	<1,060	<1,060	<1,060
S97T001215	196:6	Upper half	<960	<964	<962
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	<949	<960	<955
S97T001222		Lower half	<1,040	<1,020	<1,030
S97T001217	196:8	Upper half	<1,010	<977	<994
S97T001223		Lower half	<1,000	<962	<981
S97T001218	196:9	Upper half	<997	<987	<992
S97T001224		Lower half	<1,100	<1,050	<1,080
S97T001752		Lower half	<994	<975	<985
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<10.1	<10.1	<10.1
S97T001153	196:4	Drainable liquid	<5.05	<5.05	<5.05

Table B2-32. Tank 241-AW-105 Analytical Results: Neodymium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-33. Tank 241-AW-105 Analytical Results: Nickel (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	<4.02	<4.02	<4.02
S97T001153	196:4	Drainable liquid	<2.02	<2.02	<2.02

Table B2-34. Tank 241-AW-105 Analytical Results: Phosphorus (ICP). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	<4,320	<4,140	<4,230
S97T001169	195:5	Upper half	<3,980	<3,960	<3,970
S97T001175		Lower half	<4,250	<4,220	<4,240
S97T001170	195:6	Upper half	<4,050	<3,980	<4,020
S97T001176		Lower half	<4,010	<3,950	<3,980
S97T001171	195:7	Upper half	<4,020	<4,050	<4,040
S97T001177		Lower half	<4,020	<4,030	<4,030
S97T001172	195:8	Upper half	<3,990	<3,960	<3,980
S97T001178		Lower half	<4,070	<3,930	<4,000
S97T001173	195:9	Upper half	<4,030	<4,050	<4,040
S97T001179		Lower half	<4,230	<4,400	<4,320
S97T001219	196:4	Lower half	<4,240	<4,060	<4,150
S97T001214	196:5	Upper half	<3,940	<3,930	<3,940
S97T001220		Lower half	<4,260	<4,240	<4,250
S97T001215	196:6	Upper half	<3,840	<3,850	<3,850
S97T001221		Lower half	<4,030	<3,920	<3,980
S97T001216	196:7	Upper half	<3,790	<3,840	<3,820
S97T001222		Lower half	<4,170	<4,070	<4,120
S97T001217	196:8	Upper half	<4,040	<3,910	<3,980
S97T001223		Lower half	<4,020	<3,850	<3,940
S97T001218	196:9	Upper half	<3,990	<3,950	<3,970
S97T001224		Lower half	<4,420	<4,210	<4,320
S97T001752		Lower half	<3,980	<3,900	<3,940

Table B2-34. Tank 241-AW-105 Analytical Results: Phosphorus (ICP). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	163	133	148[QC:e]
S97T001153	196:4	Drainable liquid	117	119	118

Table B2-35. Tank 241-AW-105 Analytical Results: Potassium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	5,380	5,460	5,420
S97T001153	196:4	Drainable liquid	4,920	4,940	4,930

Table B2-36. Tank 241-AW-105 Analytical Results: Samarium (ICP). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130

Table B2-36. Tank 241-AW-105 Analytical Results: Samarium (ICP). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**μg/g**	**μg/g**	**μg/g**
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	<20.1	<20.1	<20.1
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-37. Tank 241-AW-105 Analytical Results: Selenium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001175	195:5	Lower half	<2,130	<2,110	<2,120
S97T001176	195:6	Lower half	<2,010	<1,970	<1,990
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001220	196:5	Lower half	<2,130	<2,120	<2,130
S97T001221	196:6	Lower half	<2,010	<1,960	<1,990
S97T001222	196:7	Lower half	<2,090	<2,040	<2,070
S97T001223	196:8	Lower half	<2,010	<1,920	<1,970
S97T001224	196:9	Lower half	<2,210	<2,110	<2,160
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001153	196:4	Drainable liquid	<10.1	<10.1	<10.1

Table B2-38. Tank 241-AW-105 Analytical Results: Silicon (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	1,660	1,210	1,440[QC:e]
S97T001169	195:5	Upper half	2,290	2,170	2,230
S97T001175		Lower half	1,430	1,710	1,570
S97T001170	195:6	Upper half	1,480	1,470	1,480
S97T001176		Lower half	3,330	2,830	3,080
S97T001171	195:7	Upper half	1,620	1,570	1,600
S97T001177		Lower half	3,630	2,790	3,210[QC:e]
S97T001172	195:8	Upper half	1,780	1,880	1,830
S97T001178		Lower half	2,020	1,920	1,970
S97T001173	195:9	Upper half	1,560	1,830	1,700
S97T001179		Lower half	3,580	3,590	3,590
S97T001219	196:4	Lower half	<1,060	1,150	<1,110
S97T001214	196:5	Upper half	2,500	2,610	2,560
S97T001220		Lower half	1,100	1,180	1,140
S97T001215	196:6	Upper half	1,350	1,490	1,420
S97T001221		Lower half	1,340	1,360	1,350
S97T001216	196:7	Upper half	2,030	1,990	2,010
S97T001222		Lower half	1,740	1,410	1,580[QC:e]
S97T001217	196:8	Upper half	1,820	2,620	2,220[QC:e]
S97T001223		Lower half	1,340	1,390	1,370
S97T001218	196:9	Upper half	2,110	1,870	1,990
S97T001224		Lower half	2,860	3,020	2,940
S97T001752		Lower half	3,550	3,150	3,350
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	110	85.6	97.8[QC:e]
S97T001153	196:4	Drainable liquid	103	116	110[QC:d]

Table B2-39. Tank 241-AW-105 Analytical Results: Silver (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	232	<211	<222
S97T001170	195:6	Upper half	365	392	379
S97T001176		Lower half	<201	235	<218
S97T001171	195:7	Upper half	447	401	424
S97T001177		Lower half	347	344	346
S97T001172	195:8	Upper half	506	487	497
S97T001178		Lower half	397	465	431
S97T001173	195:9	Upper half	520	527	524
S97T001179		Lower half	300	275	288
S97T001219	196:4	Lower half	<212	<203	<208[QC:c]
S97T001214	196:5	Upper half	352	380	366
S97T001220		Lower half	218	<212	<215
S97T001215	196:6	Upper half	457	443	450
S97T001221		Lower half	218	213	216
S97T001216	196:7	Upper half	449	395	422
S97T001222		Lower half	213	221	217[QC:c]
S97T001217	196:8	Upper half	469	541	505
S97T001223		Lower half	271	275	273
S97T001218	196:9	Upper half	573	620	597
S97T001224		Lower half	<221	<211	<216[QC:c]
S97T001752		Lower half	<199	201	<200
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	1.52	1.66	1.59

Table B2-40. Tank 241-AW-105 Analytical Results: Sodium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µg/g	µg/g	µg/g
S97T001174	195:4	Lower half	20,200	26,000	23,100[QC:e]
S97T001169	195:5	Upper half	42,600	44,200	43,400
S97T001175		Lower half	65,600	64,600	65,100
S97T001170	195:6	Upper half	1.19E+05	1.14E+05	1.17E+05
S97T001176		Lower half	1.11E+05	1.11E+05	1.11E+05
S97T001171	195:7	Upper half	1.15E+05	1.14E+05	1.15E+05
S97T001177		Lower half	1.59E+05	1.58E+05	1.59E+05
S97T001172	195:8	Upper half	1.49E+05	1.48E+05	1.49E+05
S97T001178		Lower half	1.69E+05	1.71E+05	1.70E+05
S97T001173	195:9	Upper half	1.65E+05	1.64E+05	1.65E+05
S97T001179		Lower half	78,500	95,500	87,000
S97T001219	196:4	Lower half	28,200	28,800	28,500
S97T001214	196:5	Upper half	56,600	56,400	56,500
S97T001220		Lower half	71,800	73,200	72,500
S97T001215	196:6	Upper half	1.28E+05	1.21E+05	1.25E+05
S97T001221		Lower half	83,900	85,300	84,600
S97T001216	196:7	Upper half	1.19E+05	1.20E+05	1.20E+05
S97T001222		Lower half	1.18E+05	1.17E+05	1.18E+05
S97T001217	196:8	Upper half	1.68E+05	1.58E+05	1.63E+05
S97T001223		Lower half	1.24E+05	1.26E+05	1.25E+05
S97T001218	196:9	Upper half	1.50E+05	1.46E+05	1.48E+05
S97T001224		Lower half	86,000	1.42E+05	1.14E+05[QC:e]
S97T001752		Lower half	1.31E+05	1.30E+05	1.31E+05[QC:c]
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	23,300	23,700	23,500[QC:c]
S97T001153	196:4	Drainable liquid	22,700	22,600	22,700[QC:c]

Table B2-41. Tank 241-AW-105 Analytical Results: Strontium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	<212	<220	<216
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	<197	<197	<197
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	<199	<197	<198
S97T001224		Lower half	<221	<211	<216
S97T001752		Lower half	<199	<195	<197
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	<1.01	<1.01	<1.01

Table B2-42. Tank 241-AW-105 Analytical Results: Sulfur (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	<2,160	<2,070	<2,120
S97T001169	195:5	Upper half	<1,990	<1,980	<1,990
S97T001175		Lower half	<2,130	<2,110	<2,120
S97T001170	195:6	Upper half	<2,030	<1,990	<2,010
S97T001176		Lower half	<2,010	<1,970	<1,990
S97T001171	195:7	Upper half	<2,010	<2,030	<2,020
S97T001177		Lower half	<2,010	<2,020	<2,020
S97T001172	195:8	Upper half	<2,000	<1,980	<1,990
S97T001178		Lower half	<2,040	<1,970	<2,010
S97T001173	195:9	Upper half	<2,010	<2,020	<2,020
S97T001179		Lower half	<2,120	<2,200	<2,160
S97T001219	196:4	Lower half	<2,120	<2,030	<2,080
S97T001214	196:5	Upper half	<1,970	<1,970	<1,970
S97T001220		Lower half	<2,130	<2,120	<2,130
S97T001215	196:6	Upper half	<1,920	<1,930	<1,930
S97T001221		Lower half	<2,010	<1,960	<1,990
S97T001216	196:7	Upper half	<1,900	<1,920	<1,910
S97T001222		Lower half	<2,090	<2,040	<2,070
S97T001217	196:8	Upper half	<2,020	<1,950	<1,990
S97T001223		Lower half	<2,010	<1,920	<1,970
S97T001218	196:9	Upper half	<1,990	<1,970	<1,980
S97T001224		Lower half	<2,210	<2,110	<2,160
S97T001752		Lower half	<1,990	<1,950	<1,970
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	200	196	198
S97T001153	196:4	Drainable liquid	174	173	174

Table B2-43. Tank 241-AW-105 Analytical Results: Thallium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<4,320	<4,140	<4,230
S97T001169	195:5	Upper half	<3,980	<3,960	<3,970
S97T001175		Lower half	<4,250	<4,220	<4,240
S97T001170	195:6	Upper half	<4,050	<3,980	<4,020
S97T001176		Lower half	<4,010	<3,950	<3,980
S97T001171	195:7	Upper half	<4,020	<4,050	<4,040
S97T001177		Lower half	<4,020	<4,030	<4,030
S97T001172	195:8	Upper half	<3,990	<3,960	<3,980
S97T001178		Lower half	<4,070	<3,930	<4,000
S97T001173	195:9	Upper half	<4,030	<4,050	<4,040
S97T001179		Lower half	<4,230	<4,400	<4,320
S97T001219	196:4	Lower half	<4,240	<4,060	<4,150
S97T001214	196:5	Upper half	<3,940	<3,930	<3,940
S97T001220		Lower half	<4,260	<4,240	<4,250
S97T001215	196:6	Upper half	<3,840	<3,850	<3,850
S97T001221		Lower half	<4,030	<3,920	<3,980
S97T001216	196:7	Upper half	<3,790	<3,840	<3,820
S97T001222		Lower half	<4,170	<4,070	<4,120
S97T001217	196:8	Upper half	<4,040	<3,910	<3,980
S97T001223		Lower half	<4,020	<3,850	<3,940
S97T001218	196:9	Upper half	<3,990	<3,950	<3,970
S97T001224		Lower half	<4,420	<4,210	<4,320
S97T001752		Lower half	<3,980	<3,900	<3,940
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<40.2	<40.2	<40.2
S97T001153	196:4	Drainable liquid	<20.2	<20.2	<20.2

Table B2-44. Tank 241-AW-105 Analytical Results: Titanium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	<201	<202	<202
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	<197	<201
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	<212	<220	<216
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	<197	<197	<197
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	<193	<193
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	<192	<191
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	<202	<195	<199
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	<199	<197	<198
S97T001224		Lower half	<221	<211	<216
S97T001752		Lower half	<199	<195	<197
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<2.01	<2.01	<2.01
S97T001153	196:4	Drainable liquid	<1.01	<1.01	<1.01

Table B2-45. Tank 241-AW-105 Analytical Results: Total Uranium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	35,700	37,500	36,600
S97T001169	195:5	Upper half	78,800	78,500	78,700
S97T001175		Lower half	<10,600	<10,600	<10,600
S97T001170	195:6	Upper half	23,700	26,200	25,000
S97T001176		Lower half	<10,000	<9,870	<9,940
S97T001171	195:7	Upper half	21,300	22,400	21,900
S97T001177		Lower half	29,300	25,700	27,500
S97T001172	195:8	Upper half	25,900	22,600	24,300
S97T001178		Lower half	41,000	40,300	40,700
S97T001173	195:9	Upper half	28,200	27,800	28,000
S97T001179		Lower half	67,600	63,200	65,400
S97T001219	196:4	Lower half	76,300	71,600	74,000
S97T001214	196:5	Upper half	47,800	47,400	47,600
S97T001220		Lower half	<10,600	<10,600	<10,600
S97T001215	196:6	Upper half	27,400	29,200	28,300
S97T001221		Lower half	<10,100	<9,800	<9,950
S97T001216	196:7	Upper half	30,300	31,600	31,000
S97T001222		Lower half	<10,400	<10,200	<10,300
S97T001217	196:8	Upper half	32,200	35,000	33,600
S97T001223		Lower half	<10,000	<9,620	<9,810
S97T001218	196:9	Upper half	41,300	38,100	39,700
S97T001224		Lower half	42,800	23,100	33,000[QC:e]
S97T001752		Lower half	43,000	39,900	41,500
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	362	<100	<231[QC:c,e]
S97T001153	196:4	Drainable liquid	61.6	95.1	78.3[QC:e]

Table B2-46. Tank 241-AW-105 Analytical Results: Vanadium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	<1,080	<1,030	<1,060
S97T001169	195:5	Upper half	<994	<989	<992
S97T001175		Lower half	<1,060	<1,060	<1,060
S97T001170	195:6	Upper half	<1,010	<996	<1,000
S97T001176		Lower half	<1,000	<987	<994
S97T001171	195:7	Upper half	<1,000	<1,010	<1,010
S97T001177		Lower half	<1,010	<1,010	<1,010
S97T001172	195:8	Upper half	<998	<991	<995
S97T001178		Lower half	<1,020	<983	<1,000
S97T001173	195:9	Upper half	<1,010	<1,010	<1,010
S97T001179		Lower half	<1,060	<1,100	<1,080
S97T001219	196:4	Lower half	<1,060	<1,010	<1,040
S97T001214	196:5	Upper half	<985	<983	<984
S97T001220		Lower half	<1,060	<1,060	<1,060
S97T001215	196:6	Upper half	<960	<964	<962
S97T001221		Lower half	<1,010	<980	<995
S97T001216	196:7	Upper half	<949	<960	<955
S97T001222		Lower half	<1,040	<1,020	<1,030
S97T001217	196:8	Upper half	<1,010	<977	<994
S97T001223		Lower half	<1,000	<962	<981
S97T001218	196:9	Upper half	<997	<987	<992
S97T001224		Lower half	<1,100	<1,050	<1,080
S97T001752		Lower half	<994	<975	<985
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	<10.1	<10.1	<10.1
S97T001153	196:4	Drainable liquid	<5.05	<5.05	<5.05

Table B2-47. Tank 241-AW-105 Analytical Results: Zinc (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	<216	<207	<212
S97T001169	195:5	Upper half	<199	<198	<199
S97T001175		Lower half	<213	<211	<212
S97T001170	195:6	Upper half	<203	<199	<201
S97T001176		Lower half	<201	<197	<199
S97T001171	195:7	Upper half	<201	<203	<202
S97T001177		Lower half	391	510	451[QC:e]
S97T001172	195:8	Upper half	<200	<198	<199
S97T001178		Lower half	<204	378	<291[QC:e]
S97T001173	195:9	Upper half	<201	<202	<202
S97T001179		Lower half	351	429	390
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	263	206	235[QC:e]
S97T001220		Lower half	<213	<212	<213
S97T001215	196:6	Upper half	<192	377	<285[QC:e]
S97T001221		Lower half	<201	<196	<199
S97T001216	196:7	Upper half	<190	373	<282[QC:e]
S97T001222		Lower half	<209	<204	<207
S97T001217	196:8	Upper half	500	<195	<348[QC:e]
S97T001223		Lower half	<201	<192	<197
S97T001218	196:9	Upper half	409	236	323[QC:e]
S97T001224		Lower half	<221	<211	<216
S97T001752		Lower half	218	225	222
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	7.4	6.56	6.98
S97T001153	196:4	Drainable liquid	4.47	4.31	4.39

Table B2-48. Tank 241-AW-105 Analytical Results: Zirconium (ICP).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**μg/g**	**μg/g**	**μg/g**
S97T001174	195:4	Lower half	9,830	11,700	10,800
S97T001169	195:5	Upper half	34,700	36,100	35,400
S97T001175		Lower half	53,400	54,700	54,100
S97T001170	195:6	Upper half	76,000	82,400	79,200
S97T001176		Lower half	59,700	58,900	59,300
S97T001171	195:7	Upper half	85,200	85,300	85,300
S97T001177		Lower half	82,200	83,200	82,700
S97T001172	195:8	Upper half	1.04E+05	96,400	1.00E+05
S97T001178		Lower half	1.05E+05	1.09E+05	1.07E+05
S97T001173	195:9	Upper half	1.12E+05	1.11E+05	1.12E+05
S97T001179		Lower half	27,600	29,500	28,600
S97T001219	196:4	Lower half	<212	<203	<208
S97T001214	196:5	Upper half	76,800	77,600	77,200
S97T001220		Lower half	58,100	57,800	58,000
S97T001215	196:6	Upper half	85,500	87,800	86,700
S97T001221		Lower half	62,200	61,000	61,600
S97T001216	196:7	Upper half	92,400	89,800	91,100
S97T001222		Lower half	63,100	62,600	62,900
S97T001217	196:8	Upper half	1.03E+05	1.03E+05	1.03E+05
S97T001223		Lower half	80,300	79,300	79,800
S97T001218	196:9	Upper half	1.18E+05	1.18E+05	1.18E+05
S97T001224		Lower half	13,400	8,590	11,000[QC:e]
S97T001752		Lower half	11,400	9,560	10,500
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	40.5	<2.01	<21.3[QC:e]
S97T001153	196:4	Drainable liquid	<1.01	1.71	<1.36[QC:e]

Table B2-49. Tank 241-AW-105 Analytical Results: Total Uranium.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µg/g**	**µg/g**	**µg/g**
S97T001174	195:4	Lower half	56,700	47,400	52,100
S97T001169	195:5	Upper half	32,900	32,900	32,900
S97T001175		Lower half	10,900	11,400	11,200
S97T001170	195:6	Upper half	6,480	7,320	6,900
S97T001176		Lower half	6,070	5,920	6,000
S97T001171	195:7	Upper half	5,620	5,420	5,520
S97T001177		Lower half	5,380	5,350	5,370
S97T001172	195:8	Upper half	2,630	2,560	2,600
S97T001178		Lower half	11,300	11,500	11,400
S97T001173	195:9	Upper half	6,800	7,290	7,050
S97T001179		Lower half	53,900	45,000	49,500
S97T001219	196:4	Lower half	63,600	71,500	67,600
S97T001214	196:5	Upper half	11,700	12,600	12,200
S97T001220		Lower half	5,140	4,950	5,050
S97T001215	196:6	Upper half	3,730	4,150	3,940
S97T001221		Lower half	5,440	5,590	5,520
S97T001216	196:7	Upper half	5,120	4,990	5,060
S97T001222		Lower half	6,310	6,870	6,590
S97T001217	196:8	Upper half	4,990	5,620	5,310
S97T001223		Lower half	8,940	8,520	8,730
S97T001218	196:9	Upper half	7,780	7,900	7,840
S97T001224		Lower half	45,600	24,800	35,200[QC:e]
S97T001752		Lower half	27,200	26,800	27,000

Table B2-50. Tank 241-AW-105 Analytical Results: Total Uranium (Kinetic Phosphorescence).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001496	195:4	Drainable liquid	194	129	162[QC:d,e]

Table B2-51. Tank 241-AW-105 Analytical Results: Bromide (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	<294	<296	<295
S97T001180	195:5	Upper half	<271	<274	<272
S97T001186		Lower half	<270	<269	<270
S97T001181	195:6	Upper half	<274	<275	<274
S97T001187		Lower half	<280	<274	<277
S97T001182	195:7	Upper half	<274	<273	<273
S97T001188		Lower half	<519	<511	<515
S97T001183	195:8	Upper half	<1,010	<1,010	<1,010
S97T001189		Lower half	<986	<1,020	<1,000
S97T001184	195:9	Upper half	<1,030	<1,040	<1,040
S97T001190		Lower half	<1,070	<1,070	<1,070
S97T001230	196:4	Lower half	<264	<260	<262
S97T001225	196:5	Upper half	<505	<529	<517
S97T001231		Lower half	<1,380	<1,320	<1,350
S97T001226	196:6	Upper half	<2,560	<2,530	<2,550
S97T001232		Lower half	<992	<967	<980
S97T001227	196:7	Upper half	<2,490	<2,530	<2,510
S97T001233		Lower half	<1,280	<1,270	<1,270
S97T001228	196:8	Upper half	<1,020	<975	<996
S97T001234		Lower half	<1,050	<1,020	<1,030
S97T001229	196:9	Upper half	<1,020	<994	<1,010
S97T001235		Lower half	<980	<940	<960
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	<139	<139	<139
S97T001153	196:4	Drainable liquid	<139	<139	<139

Table B2-52. Tank 241-AW-105 Analytical Results: Chloride (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	204	203	203
S97T001180	195:5	Upper half	280	306	293
S97T001186		Lower half	184	194	189
S97T001181	195:6	Upper half	181	141	161[QC:e]
S97T001187		Lower half	137	141	139
S97T001182	195:7	Upper half	239	228	233
S97T001188		Lower half	<340	<334	<337
S97T001183	195:8	Upper half	401	420	411
S97T001189		Lower half	335	391	363
S97T001184	195:9	Upper half	453	415	434
S97T001190		Lower half	384	497	441[QC:e]
S97T001230	196:4	Lower half	317	306	312
S97T001225	196:5	Upper half	147	235	191[QC:e]
S97T001231		Lower half	458	537	498
S97T001226	196:6	Upper half	<349	<344	<346
S97T001232		Lower half	687	745	716
S97T001227	196:7	Upper half	<339	<344	<342
S97T001233		Lower half	253	259	256
S97T001228	196:8	Upper half	644	600	622
S97T001234		Lower half	434	<341	<387[QC:e]
S97T001229	196:9	Upper half	576	626	601
S97T001235		Lower half	488	673	581[QC:e]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	221	227	224
S97T001153	196:4	Drainable liquid	262	260	261

Table B2-53. Tank 241-AW-105 Analytical Results: Fluoride (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	4,540	4,550	4,550
S97T001180	195:5	Upper half	8,810	8,690	8,750
S97T001186		Lower half	39,000	39,000	39,000
S97T001181	195:6	Upper half	62,400	62,900	62,700
S97T001187		Lower half	79,800	78,700	79,300[QC:c]
S97T001182	195:7	Upper half	67,100	60,400	63,800
S97T001188		Lower half	88,200	83,800	86,000
S97T001183	195:8	Upper half	73,100	70,500	71,800
S97T001189		Lower half	1.15E+05	80,300	97,500[QC:e]
S97T001184	195:9	Upper half	76,600	79,100	77,800
S97T001190		Lower half	4,420	4,470	4,450
S97T001230	196:4	Lower half	4,330	4,240	4,280[QC:c]
S97T001225	196:5	Upper half	14,600	14,400	14,500
S97T001231		Lower half	47,700	47,800	47,700
S97T001226	196:6	Upper half	59,600	58,300	58,900
S97T001232		Lower half	58,300	59,500	58,900
S97T001227	196:7	Upper half	53,400	57,900	55,600
S97T001233		Lower half	87,400	78,900	83,200[QC:c]
S97T001228	196:8	Upper half	72,500	68,900	70,700
S97T001234		Lower half	73,300	72,300	72,800
S97T001229	196:9	Upper half	55,900	54,700	55,300
S97T001235		Lower half	4,990	4,220	4,600
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	3,010	3,020	3,020
S97T001153	196:4	Drainable liquid	2,680	2,720	2,700[QC:c]

Table B2-54. Tank 241-AW-105 Analytical Results: Nitrate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S97T001185	195:4	Lower half	26,400	26,600	26,500
S97T001180	195:5	Upper half	22,600	22,500	22,500
S97T001186		Lower half	19,400	19,500	19,400
S97T001181	195:6	Upper half	18,800	18,000	18,400
S97T001187		Lower half	13,600	13,200	13,400
S97T001182	195:7	Upper half	18,000	18,100	18,100
S97T001188		Lower half	21,900	23,000	22,500
S97T001183	195:8	Upper half	29,000	28,500	28,800
S97T001189		Lower half	28,800	31,700	30,300
S97T001184	195:9	Upper half	32,600	31,200	31,900
S97T001190		Lower half	31,700	34,800	33,200
S97T001230	196:4	Lower half	26,600	25,900	26,200
S97T001225	196:5	Upper half	23,100	20,200	21,700
S97T001231		Lower half	20,300	21,100	20,700
S97T001226	196:6	Upper half	19,700	19,600	19,700
S97T001232		Lower half	25,300	22,400	23,800
S97T001227	196:7	Upper half	21,600	21,700	21,600
S97T001233		Lower half	23,300	23,500	23,400
S97T001228	196:8	Upper half	33,000	32,900	33,000
S97T001234		Lower half	35,000	31,900	33,400
S97T001229	196:9	Upper half	38,000	36,100	37,000
S97T001235		Lower half	34,900	38,800	36,800
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	31,700	31,900	31,800
S97T001153	196:4	Drainable liquid	33,000	32,700	32,900

Table B2-55. Tank 241-AW-105 Analytical Results: Nitrite (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			µg/g	µg/g	µg/g
S97T001185	195:4	Lower half	2,400	2,580	2,490
S97T001180	195:5	Upper half	3,500	3,480	3,490
S97T001186		Lower half	3,950	3,930	3,940
S97T001181	195:6	Upper half	3,940	3,840	3,890
S97T001187		Lower half	3,380	3,210	3,300
S97T001182	195:7	Upper half	5,130	5,100	5,110
S97T001188		Lower half	6,960	7,590	7,280
S97T001183	195:8	Upper half	10,200	10,200	10,200
S97T001189		Lower half	10,900	11,900	11,400
S97T001184	195:9	Upper half	11,300	11,500	11,400
S97T001190		Lower half	13,100	13,700	13,400
S97T001230	196:4	Lower half	2,570	24,90	2,530
S97T001225	196:5	Upper half	3,830	3,650	3,740
S97T001231		Lower half	4,900	4,930	4,910
S97T001226	196:6	Upper half	5,480	5,460	5,470
S97T001232		Lower half	6,650	6,470	6,560
S97T001227	196:7	Upper half	6,950	6,980	6,960
S97T001233		Lower half	7,160	7,000	7,080
S97T001228	196:8	Upper half	12,700	12,500	12,600
S97T001234		Lower half	13,100	12,500	12,800
S97T001229	196:9	Upper half	14,600	14,000	14,300
S97T001235		Lower half	12,700	13900	13,300
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	2,260	2,250	2,260
S97T001153	196:4	Drainable liquid	2,270	2,200	2,230

Table B2-56. Tank 241-AW-105 Analytical Results: Phosphate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**μg/g**	**μg/g**	**μg/g**
S97T001185	195:4	Lower half	415	375	395
S97T001180	195:5	Upper half	368	398	383
S97T001186		Lower half	<260	<258	<259
S97T001181	195:6	Upper half	<263	<264	<263
S97T001187		Lower half	<269	<263	<266
S97T001182	195:7	Upper half	<263	<262	<262
S97T001188		Lower half	<2,400	<2,360	<2,380
S97T001183	195:8	Upper half	<974	<974	<974
S97T001189		Lower half	<2,330	<2,410	<2,370
S97T001184	195:9	Upper half	<991	<998	<995
S97T001190		Lower half	7,910	6,840	7,380
S97T001230	196:4	Lower half	547	529	538
S97T001225	196:5	Upper half	<485	<508	<496
S97T001231		Lower half	<1,330	<1,260	<1,290
S97T001226	196:6	Upper half	<2,460	<2,430	<2,450
S97T001232		Lower half	<2,350	<2,290	<2,320
S97T001227	196:7	Upper half	<2,390	2,730	<2,560
S97T001233		Lower half	<1,230	<1,220	<1,220
S97T001228	196:8	Upper half	<975	<936	<956
S97T001234		Lower half	<2,470	<2,410	<2,440
S97T001229	196:9	Upper half	<978	<955	<966
S97T001235		Lower half	18,600	13,800	16,200[QC:e]
Liquids			**μg/mL**	**μg/mL**	**μg/mL**
S97T001112	195:4	Drainable liquid	185	154	170
S97T001153	196:4	Drainable liquid	168	147	158

Table B2-57. Tank 241-AW-105 Analytical Results: Sulfate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	765	912	838
S97T001180	195:5	Upper half	1,090	1,260	1,180
S97T001186		Lower half	1,390	1,400	1,390
S97T001181	195:6	Upper half	1,220	1,150	1,190
S97T001187		Lower half	1,030	1,050	1,040
S97T001182	195:7	Upper half	1,070	1,020	1,040
S97T001188		Lower half	<2,760	3,350	<3,050
S97T001183	195:8	Upper half	1,210	<1,120	<1,170
S97T001189		Lower half	3,630	3,430	3,530
S97T001184	195:9	Upper half	1,300	1,540	1,420
S97T001190		Lower half	3,590	3,620	3,600
S97T001230	196:4	Lower half	1,070	934	1,000
S97T001225	196:5	Upper half	1,330	1,330	1,330
S97T001231		Lower half	3,190	3,430	3,310
S97T001226	196:6	Upper half	2,930	<2,790	<2,860
S97T001232		Lower half	4,720	3,660	4,190[QC:e]
S97T001227	196:7	Upper half	2,850	<2,790	<2,820
S97T001233		Lower half	1,860	2,520	2,190[QC:e]
S97T001228	196:8	Upper half	<1,120	<1,080	<1,100
S97T001234		Lower half	3,480	3,360	3,420
S97T001229	196:9	Upper half	1,710	1,780	1,750
S97T001235		Lower half	2,840	3,630	3,240[QC:e]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	539	572	556
S97T001153	196:4	Drainable liquid	658	684	671

Table B2-58. Tank 241-AW-105 Analytical Results: Oxalate (IC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	<247	<248	<247
S97T001180	195:5	Upper half	429	328	379[QC:e]
S97T001186		Lower half	320	251	286[QC:e]
S97T001181	195:6	Upper half	231	377	304[QC:e]
S97T001187		Lower half	<235	<230	<232
S97T001182	195:7	Upper half	299	315	307
S97T001188		Lower half	<2,100	<2,060	<2,080
S97T001183	195:8	Upper half	969	<852	<910
S97T001189		Lower half	<2,040	<2,110	<2,080
S97T001184	195:9	Upper half	1,140	1,180	1,160
S97T001190		Lower half	23,400	23,000	23,200
S97T001230	196:4	Lower half	<222	<219	<221
S97T001225	196:5	Upper half	<424	<444	<434
S97T001231		Lower half	<1,160	<1,100	<1,130
S97T001226	196:6	Upper half	<2,150	<2,130	<2,140
S97T001232		Lower half	<2,050	<2,000	<2,030
S97T001227	196:7	Upper half	<2,100	<2,120	<2,110
S97T001233		Lower half	<1,070	<1,070	<1,070
S97T001228	196:8	Upper half	<853	834	<844
S97T001234		Lower half	<2,160	<2,110	<2140
S97T001229	196:9	Upper half	1,840	1,420	1,630[QC:e]
S97T001235		Lower half	64,700	1.02E+05	83,400[QC:e]
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001112	195:4	Drainable liquid	136	137	137
S97T001153	196:4	Drainable liquid	162	119	140[QC:e]

Table B2-59. Tank 241-AW-105 Analytical Results: Hydroxide.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S97T001185	195:4	Lower half	<8,980	<9,030	<9,010
S97T001180	195:5	Upper half	8,790	7,820	8,310
S97T001186		Lower half	<8,260	<8,200	<8,230
S97T001181	195:6	Upper half	9,860	7,050	8,460[QC:e]
S97T001187		Lower half	<8,540	<8,370	<8,460
S97T001182	195:7	Upper half	6,740	<4,960	<5,850[QC:e]
S97T001188		Lower half	<8,300	<8,170	<8,240
S97T001183	195:8	Upper half	5,370	7,380	6,380[QC:e]
S97T001189		Lower half	<8,080	<8,350	<8,220
S97T001184	195:9	Upper half	6,560	<5,080	<5,820[QC:e]
S97T001190		Lower half	11,800	15,100	13,500[QC:e]
S97T001230	196:4	Lower half	<8,080	<8,080	<8,080
S97T001225	196:5	Upper half	9,390	7,780	8,590
S97T001231		Lower half	9,300	<9,100	<9,200
S97T001226	196:6	Upper half	<5,080	7,740	<6,410[QC:e]
S97T001232		Lower half	<8,130	<8,130	<8,130
S97T001227	196:7	Upper half	9,100	8,140	8,620
S97T001233		Lower half	7,590	8,230	7,910
S97T001228	196:8	Upper half	7,790	7,990	7,890
S97T001234		Lower half	7,470	7,690	7,580
S97T001229	196:9	Upper half	8,230	7,370	7,800
S97T001235		Lower half	<4,780	<4,580	<4,680
Liquids			**µg/mL**	**µg/mL**	**µg/mL**
S97T001496	195:4	Drainable liquid	8,340	8,810	8,580
S97T001498	196:4	Drainable liquid	6,750	5,970	6,360

Table B2-60. Tank 241-AW-105 Analytical Results: Ammonia (Ion Selective Electrode).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids (Cont'd)			µg/mL	µg/mL	µg/mL
S97T001496	195:4	Drainable liquid	948	928	938
S97T001806	196:4	Drainable liquid	847	1,010	929

Table B2-61. Tank 241-AW-105 Analytical Results: Total Inorganic Carbon.
(2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids			µg/g	µg/g	µg/g	µg/g
S97T001106	195:4	Lower half	799	767		783
S97T001101	195:5	Upper half	749	760	764	758
S97T001107		Lower half	1,090	1,110		1,100
S97T001102	195:6	Upper half	686	640		663
S97T001108		Lower half	819	756		788
S97T001103	195:7	Upper half	633	632		633
S97T001109		Lower half	1,070	1,280		1,180
S97T001104	195:8	Upper half	1,630	1,720		1,680
S97T001110		Lower half	2,010	2,370		2,190
S97T001105	195:9	Upper half	2,810	2,890		2,850
S97T001111		Lower half	4,170	4,670		4,420
S97T001147	196:4	Lower half	600	623		612
S97T001142	196:5	Upper half	649	763		706
S97T001148		Lower half	692	674		683
S97T001143	196:6	Upper half	999	853	855	902
S97T001149		Lower half	852	924	883	886
S97T001144	196:7	Upper half	832	662	776	757[QC:e]
S97T001150		Lower half	912	951		932
S97T001145	196:8	Upper half	2,070	1,920		2,000
S97T001151		Lower half	936	2,400	2,210	1,850[QC:e]
S97T001146	196:9	Upper half	3,180	2,920		3,050
S97T001152		Lower half	4,530	4,410	4,440	4,460

Table B2-61. Tank 241-AW-105 Analytical Results: Total Inorganic Carbon. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Liquids			μg/mL	μg/mL	μg/mL	μg/mL
S97T001496	195:4	Drainable liquid	514	507		511[QC:d]
S97T001806	196:4	Drainable liquid	320	365		343

Table B2-62. Tank 241-AW-105 Analytical Results: Total Organic Carbon. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids			μg/g	μg/g	μg/g	μg/g
S97T001106	195:4	Lower half	2,120	1,870		2,000
S97T001101	195:5	Upper half	353	483	40.3	292[QC:e]
S97T001107		Lower half	2,380	1,980		2,180
S97T001102	195:6	Upper half	393	458		426
S97T001108		Lower half	4,020	3,830		3,930
S97T001103	195:7	Upper half	5,360	5,440		5,400
S97T001109		Lower half	5,620	6,180		5,900
S97T001104	195:8	Upper half	6,010	6,140		6,080
S97T001110		Lower half	5,220	4,780		5,000
S97T001105	195:9	Upper half	1,520	1,650		1,590
S97T001111		Lower half	18,800	22,800		20,800
S97T001147	196:4	Lower half	1,070	843		957[QC:e]
S97T001142	196:5	Upper half	2,590	2,460		2,530
S97T001148		Lower half	1,630	1,430		1,530
S97T001143	196:6	Upper half	617	450	622	563[QC:e]
S97T001149		Lower half	4,020	2,080	3,330	3,140[QC:e]
S97T001144	196:7	Upper half	546	556		551
S97T001150		Lower half	6,550	5,630		6,090
S97T001145	196:8	Upper half	979	1,090		1,030
S97T001151		Lower half	2,780	5,720	5,450	4,650[QC:e]

Table B2-62. Tank 241-AW-105 Analytical Results: Total Organic Carbon. (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids (Cont'd)			µg/g	µg/g	µg/g	µg/g
S97T001146	196:9	Upper half	7,470	6,950		7,210
S97T001152		Lower half	32,100	25,700	35,400	31,100[QC:e]
Liquids			µg/mL	µg/mL	µg/mL	µg/mL
S97T001496	195:4	Drainable liquid	1,070	1,230		1,150
S97T001806	196:4	Drainable liquid	402	362		382

Table B2-63. Tank 241-AW-105 Analytical Results: Total Organic Carbon (Furnace Oxidation).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			µg/mL	µg/mL	µg/mL
S97T001112	195:4	Drainable liquid	687	644	666
S97T001153	196:4	Drainable liquid	1,180	1,030	1,110

Table B2-64. Tank 241-AW-105 Analytical Results: Americium-241 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µCi/g	µCi/g	µCi/g
S97T001174	195:4	Lower half	0.239	0.265	0.252
S97T001169	195:5	Upper half	0.596	0.579	0.588
S97T001175		Lower half	0.24	0.207	0.224
S97T001170	195:6	Upper half	0.136	0.157	0.147
S97T001176		Lower half	0.767	0.755	0.761
S97T001171	195:7	Upper half	0.889	0.866	0.877
S97T001177		Lower half	<0.351	<0.352	<0.352
S97T001172	195:8	Upper half	<0.109	<0.129	<0.119
S97T001178		Lower half	<0.623	<0.63	<0.627
S97T001173	195:9	Upper half	<0.174	<0.212	<0.193
S97T001179		Lower half	<5.95	<5.75	<5.85

Table B2-64. Tank 241-AW-105 Analytical Results: Americium-241 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			µCi/g	µCi/g	µCi/g
S97T001219	196:4	Lower half	0.8	0.649	0.725[QC:e]
S97T001214	196:5	Upper half	0.547	0.713	0.63[QC:e]
S97T001220		Lower half	<0.194	0.22	<0.207
S97T001215	196:6	Upper half	<0.183	<0.186	<0.185
S97T001221		Lower half	0.695	0.569	0.632
S97T001216	196:7	Upper half	0.915	0.902	0.909
S97T001222		Lower half	<0.369	<0.356	<0.362
S97T001217	196:8	Upper half	<0.0942	<0.0918	<0.093
S97T001223		Lower half	<0.643	<0.651	<0.647
S97T001218	196:9	Upper half	0.513	0.298	0.406[QC:e]
S97T001224		Lower half	<5.18	<4.43	<4.8
S97T001752		Lower half	<1.66	<2.01	<1.84
Liquids			µCi/mL	µCi/mL	µCi/mL
S97T001496	195:4	Drainable liquid	<0.049	<0.0492	<0.0491
S97T001498	196:4	Drainable liquid	<0.0159	<0.0157	<0.0158

Table B2-65. Tank 241-AW-105 Analytical Results: Cesium-137 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			µCi/g	µCi/g	µCi/g
S97T001174	195:4	Lower half	13.6	13.8	13.7
S97T001169	195:5	Upper half	20.2	20.4	20.3
S97T001175		Lower half	23.3	23.2	23.2
S97T001170	195:6	Upper half	21.8	22.8	22.3
S97T001176		Lower half	23.6	23.5	23.5
S97T001171	195:7	Upper half	25.4	25.7	25.5
S97T001177		Lower half	26.8	27	26.9

Table B2-65. Tank 241-AW-105 Analytical Results: Cesium-137 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			**µCi/g**	**µCi/g**	**µCi/g**
S97T001172	195:8	Upper half	42.3	40.6	41.5
S97T001178		Lower half	41.2	41.7	41.5
S97T001173	195:9	Upper half	46.3	46.7	46.5
S97T001179		Lower half	56.1	59.9	58
S97T001219	196:4	Lower half	12.5	13.8	13.2
S97T001214	196:5	Upper half	20	19.8	19.9
S97T001220		Lower half	23.1	22.5	22.8
S97T001215	196:6	Upper half	22.6	22.8	22.7
S97T001221		Lower half	23.2	24.4	23.8
S97T001216	196:7	Upper half	27	26.2	26.6
S97T001222		Lower half	29.4	29.1	29.3
S97T001217	196:8	Upper half	45.8	44.8	45.3
S97T001223		Lower half	45.4	45.1	45.3
S97T001218	196:9	Upper half	54.3	53.3	53.8
S97T001224		Lower half	108	88.9	98.6
S97T001752		Lower half	55.7	62.9	59.3
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	11.1	11.2	11.1
S97T001498	196:4	Drainable liquid	9.78	9.76	9.77

Table B2-66. Tank 241-AW-105 Analytical Results: Cobalt-60 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	<0.0135	<0.0129	<0.0132
S97T001169	195:5	Upper half	<0.0289	<0.0283	<0.0286
S97T001175		Lower half	0.0498	0.0549	0.0524
S97T001170	195:6	Upper half	0.0371	0.0425	0.0398
S97T001176		Lower half	0.0672	0.0642	0.0657

Table B2-66. Tank 241-AW-105 Analytical Results: Cobalt-60 (GEA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion (Cont'd)			µCi/g	µCi/g	µCi/g
S97T001171	195:7	Upper half	0.041	0.0391	0.04
S97T001177		Lower half	0.0403	0.0355	0.0379
S97T001172	195:8	Upper half	0.0614	0.0565	0.0589
S97T001178		Lower half	0.118	0.0899	0.104[QC:e]
S97T001173	195:9	Upper half	0.0544	0.0607	0.0576
S97T001179		Lower half	<0.632	<0.763	<0.698
S97T001219	196:4	Lower half	<0.0861	<0.0796	<0.0829
S97T001214	196:5	Upper half	0.066	0.061	0.0635
S97T001220		Lower half	<0.102	<0.101	<0.101
S97T001215	196:6	Upper half	0.0562	0.0646	0.0604
S97T001221		Lower half	<0.111	<0.102	<0.106
S97T001216	196:7	Upper half	0.0536	0.0523	0.053
S97T001222		Lower half	0.0417	0.0397	0.0407
S97T001217	196:8	Upper half	0.0637	0.0581	0.0609
S97T001223		Lower half	0.0738	0.0948	0.0843[QC:e]
S97T001218	196:9	Upper half	0.0892	0.0829	0.0861
S97T001224		Lower half	<0.508	<0.399	<0.453
S97T001752		Lower half	<0.163	<0.194	<0.179
Liquids			µCi/mL	µCi/mL	µCi/mL
S97T001496	195:4	Drainable liquid	0.00471	0.00541	0.00506
S97T001498	196:4	Drainable liquid	0.00336	0.00323	0.0033

Table B2-67. Tank 241-AW-105 Analytical Results: Europium-154 (GEA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	<0.0377	<0.0359	<0.0368
S97T001169	195:5	Upper half	<0.0769	<0.0748	<0.0758
S97T001175		Lower half	0.0407	<0.0317	<0.0362[QC:e]
S97T001170	195:6	Upper half	<0.0168	<0.0171	<0.017
S97T001176		Lower half	<0.0389	0.0923	<0.0656[QC:e]
S97T001171	195:7	Upper half	0.125	0.1	0.112[QC:e]
S97T001177		Lower half	<0.0545	<0.0606	<0.0576
S97T001172	195:8	Upper half	<0.0301	<0.0286	<0.0293
S97T001178		Lower half	<0.106	<0.11	<0.108
S97T001173	195:9	Upper half	<0.0627	<0.065	<0.0638
S97T001179		Lower half	<2.46	<2.54	<2.5
S97T001219	196:4	Lower half	<0.264	<0.279	<0.272
S97T001214	196:5	Upper half	0.175	0.179	0.177
S97T001220		Lower half	<0.29	<0.285	<0.287
S97T001215	196:6	Upper half	<0.0311	<0.0261	<0.0286
S97T001221		Lower half	<0.277	<0.241	<0.259
S97T001216	196:7	Upper half	0.118	0.0907	0.104[QC:e]
S97T001222		Lower half	<0.0481	<0.0486	<0.0484
S97T001217	196:8	Upper half	<0.0163	<0.0168	<0.0165
S97T001223		Lower half	<0.127	<0.104	<0.115
S97T001218	196:9	Upper half	0.301	0.236	0.268[QC:e]
S97T001224		Lower half	<2.04	<1.82	<1.93
S97T001752		Lower half	<0.779	<0.871	<0.825
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	<0.00413	<0.00397	<0.00405
S97T001498	196:4	Drainable liquid	<0.00122	<0.00127	<0.00124

Table B2-68. Tank 241-AW-105 Analytical Results: Europium-155 (GEA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	0.104	0.109	0.106
S97T001169	195:5	Upper half	<0.118	0.145	<0.132[QC:e]
S97T001175		Lower half	<6.16	<0.0728	<3.12
S97T001170	195:6	Upper half	<0.0435	<0.0345	<0.039
S97T001176		Lower half	<0.0542	0.0721	<0.0631[QC:e]
S97T001171	195:7	Upper half	<0.0392	<0.0502	<0.0447
S97T001177		Lower half	<0.133	<0.138	<0.135
S97T001172	195:8	Upper half	<0.065	<0.064	<0.0645
S97T001178		Lower half	<0.247	<0.239	<0.243
S97T001173	195:9	Upper half	<0.104	<0.131	<0.117
S97T001179		Lower half	<2.34	<2.49	<2.42
S97T001219	196:4	Lower half	<0.31	<0.291	<0.301
S97T001214	196:5	Upper half	0.307	0.38	0.344[QC:e]
S97T001220		Lower half	<0.348	<0.334	<0.341
S97T001215	196:6	Upper half	<0.0707	<0.0706	<0.0706
S97T001221		Lower half	<0.324	<0.323	<0.323
S97T001216	196:7	Upper half	<0.076	0.059	<0.0675[QC:e]
S97T001222		Lower half	<0.142	<0.139	<0.141
S97T001217	196:8	Upper half	0.0637	<0.0449	<0.0543[QC:e]
S97T001223		Lower half	<0.252	<0.242	<0.247
S97T001218	196:9	Upper half	0.513	0.388	0.451[QC:e]
S97T001224		Lower half	<2.34	<1.71	<2.02
S97T001752		Lower half	<1.25	1.41	<1.33
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	<0.0187	<0.0188	<0.0187
S97T001498	196:4	Drainable liquid	<0.00603	<0.00601	<0.00602

Table B2-69. Tank 241-AW-105 Analytical Results: Americium-241 (AEA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	0.301	0.271	0.286
S97T001169	195:5	Upper half	0.587	0.579	0.583
S97T001175		Lower half	0.155	0.153	0.154
S97T001170	195:6	Upper half	0.129	0.148	0.139
S97T001176		Lower half	0.526	0.583	0.555
S97T001171	195:7	Upper half	0.919	0.89	0.905
S97T001177		Lower half	0.0602	0.0588	0.0595
S97T001172	195:8	Upper half	0.0982	0.0967	0.0975
S97T001178		Lower half	0.175	0.178	0.177
S97T001173	195:9	Upper half	0.133	0.14	0.137
S97T001179		Lower half	1.76	1.58	1.67
S97T001219	196:4	Lower half	0.658	0.635	0.647
S97T001214	196:5	Upper half	0.657	0.744	0.701
S97T001220		Lower half	0.132	0.131	0.132
S97T001215	196:6	Upper half	0.113	0.107	0.11
S97T001221		Lower half	0.431	0.449	0.44
S97T001216	196:7	Upper half	0.938	1.05	0.994
S97T001222		Lower half	0.0579	0.0542	0.0561
S97T001217	196:8	Upper half	0.115	0.107	0.111
S97T001223		Lower half	0.163	0.165	0.164
S97T001218	196:9	Upper half	0.444	0.387	0.416
S97T001224		Lower half	1.95	1.21	1.58[QC:e]
S97T001752		Lower half	2	1.87	1.94
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	7.89E-05	6.56E-05	7.23E-05
S97T001806	196:4	Drainable liquid	<7.13E-06	<6.92E-06	<7.03E-06

Table B2-70. Tank 241-AW-105 Analytical Results: Plutonium-239/240.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	1.4	1.31	1.36
S97T001169	195:5	Upper half	3.15	3.07	3.11
S97T001175		Lower half	0.613	0.679	0.646
S97T001170	195:6	Upper half	0.549	0.612	0.581
S97T001176		Lower half	0.771	0.765	0.768
S97T001171	195:7	Upper half	0.992	1.01	1.00
S97T001177		Lower half	0.275	0.27	0.273
S97T001172	195:8	Upper half	0.42	0.39	0.405
S97T001178		Lower half	0.71	0.725	0.718
S97T001173	195:9	Upper half	0.472	0.492	0.482
S97T001179		Lower half	0.838	0.837	0.837
S97T001219	196:4	Lower half	4.09	4.10	4.09
S97T001214	196:5	Upper half	2.03	2.17	2.10
S97T001220		Lower half	0.521	0.523	0.522
S97T001215	196:6	Upper half	0.422	0.425	0.424
S97T001221		Lower half	0.583	0.616	0.599
S97T001216	196:7	Upper half	1.01	0.964	0.987
S97T001222		Lower half	0.599	0.595	0.597
S97T001217	196:8	Upper half	1.40	1.35	1.38
S97T001223		Lower half	0.591	0.625	0.608
S97T001218	196:9	Upper half	1.97	2.01	1.99
S97T001224		Lower half	0.816	0.50	0.658[QC:e]
S97T001752		Lower half	0.619	0.59	0.605
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	3.16E-04	3.38E-04	3.27E-04
S97T001498	196:4	Drainable liquid	2.17E-04	1.89E-04	2.03E-04

Table B2-71. Tank 241-AW-105 Analytical Results: Strontium-89/90.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	22.5	22.8	22.6
S97T001169	195:5	Upper half	55.4	54.9	55.1
S97T001175		Lower half	14.5	15.0	14.8
S97T001170	195:6	Upper half	8.05	9.15	8.60
S97T001176		Lower half	13.0	12.7	12.8
S97T001171	195:7	Upper half	17.0	17.1	17.1
S97T001177		Lower half	4.59	4.57	4.58[QC:f]
S97T001172	195:8	Upper half	14.2	11.0	12.6[QC:e]
S97T001178		Lower half	11.5	11.1	11.3[QC:f]
S97T001173	195:9	Upper half	31.8	29.2	30.5
S97T001179		Lower half	460	390	425
S97T001219	196:4	Lower half	4.53	4.31	4.42
S97T001214	196:5	Upper half	118	125	122
S97T001220		Lower half	10.4	10.2	10.3
S97T001215	196:6	Upper half	7.19	7.05	7.12
S97T001221		Lower half	9.87	9.71	9.79
S97T001216	196:7	Upper half	16.8	16.9	16.9
S97T001222		Lower half	5.24	5.18	5.21
S97T001217	196:8	Upper half	8.34	8.05	8.20
S97T001223		Lower half	10.9	11.9	11.4
S97T001218	196:9	Upper half	116	104	110
S97T001224		Lower half	348	229	289[QC:e]
S97T001752		Lower half	262	244	253
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001496	195:4	Drainable liquid	0.0305	0.0352	0.0329
S97T001498	196:4	Drainable liquid	0.014	0.0138	0.0139

Table B2-72. Tank 241-AW-105 Analytical Results: Total Alpha.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids: fusion			**µCi/g**	**µCi/g**	**µCi/g**
S97T001174	195:4	Lower half	1.4	1.28	1.34
S97T001175	195:5	Lower half	0.50	0.50	0.50
S97T001176	195:6	Lower half	1.21	1.05	1.13[QC:c]
S97T001177	195:7	Lower half	0.222	0.192	0.207
S97T001178	195:8	Lower half	0.517	0.502	0.51
S97T001179	195:9	Lower half	2.54	2.51	2.52
S97T001219	196:4	Lower half	4.00	3.57	3.79
S97T001220	196:5	Lower half	0.437	0.453	0.445
S97T001221	196:6	Lower half	0.811	0.708	0.760
S97T001222	196:7	Lower half	0.285	0.284	0.285
S97T001223	196:8	Lower half	0.775	0.709	0.742
S97T001224	196:9	Lower half	2.28	1.60	1.94[QC:e]
S97T001752		Lower half	2.20	2.24	2.22
Liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**
S97T001112	195:4	Drainable liquid	<4.34E-04	<4.34E-04	<4.34E-04
S97T001153	196:4	Drainable liquid	0.00191	0.00177	0.00184[QC:f]

Table B2-73. Tank 241-AW-105 Analytical Results: Exotherms-Calculated Dry Weight (DSC).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			**J/g Dry Weight**	**J/g Dry Weight**	**J/g Dry Weight**
S97T001103	195:7	Upper half	0.00	5.29	2.65[QC:e]
S97T001104	195:8	Upper half	2.26	0.00	1.13[QC:e]

Table B2-74. Tank 241-AW-105 Analytical Results: Exotherm - Transition 1 (DSC/TGA).

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			J/g	J/g	J/g
S97T001103	195:7	Upper half	0.00	1.84	0.92[QC:e]
S97T001104	195:8	Upper half	1.08	0.00	0.54[QC:e]

Table B2-75. Tank 241-AW-105 Analytical Results: Percent Water (DSC/TGA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Solids			%	%	%	%
S97T001106	195:4	Lower half	81.9	81.7		81.8
S97T001101	195:5	Upper half	74.3	72.7		73.5
S97T001107		Lower half	68.2	67.6		67.9
S97T001102	195:6	Upper half	65.3	67.6		66.4
S97T001108		Lower half	61.8	63.3		62.6
S97T001103	195:7	Upper half	66	64.4		65.2
S97T001109		Lower half	59.5	49.5		54.5
S97T001104	195:8	Upper half	58.5	46.1		52.3
S97T001110		Lower half	52.8	52.0		52.4
S97T001105	195:9	Upper half	52.9	53.3		53.1
S97T001111		Lower half	56.2	53.2		54.7
S97T001147	196:4	Lower half	77.6	79.6		78.6
S97T001142	196:5	Upper half	78.7	77.3		78.0
S97T001148		Lower half	69.8	70.2		70.0
S97T001143	196:6	Upper half	65.7	65.7		65.7
S97T001149		Lower half	66.2	66.5		66.3
S97T001144	196:7	Upper half	67.7	65.2		66.5
S97T001150		Lower half	58.6	59.9		59.3
S97T001145	196:8	Upper half	58.2	56.6		57.4
S97T001151		Lower half	54.8	37.1	53.8	48.6[QC:e]
S97T001146	196:9	Upper half	57.1	57.0		57.0
S97T001152		Lower half	62.6	62.7		62.7

Table B2-75. Tank 241-AW-105 Analytical Results: Percent Water (DSC/TGA). (2 sheets)

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Triplicate	Mean
Liquids			%	%	%	%
S97T001112	195:4	Drainable liquid	91.7	92		91.8
S97T001153	196:4	Drainable liquid	92.1	92.3		92.2

Table B2-76. Tank 241-AW-105 Analytical Results: Bulk Density.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			g/mL	g/mL	g/mL
S97T001094	195:4	Lower half	1.17	NA	1.17
S97T001095	195:5	Lower half	1.24	NA	1.24
S97T001096	195:6	Lower half	1.28	NA	1.28
S97T001097	195:7	Lower half	1.36	NA	1.36
S97T001098	195:8	Lower half	1.42	NA	1.42
S97T001099	195:9	Lower half	1.30	NA	1.30
S97T001135	196:4	Lower half	1.21	NA	1.21
S97T001136	196:5	Lower half	1.23	NA	1.23
S97T001137	196:6	Lower half	1.28	NA	1.28
S97T001138	196:7	Lower half	1.36	NA	1.36
S97T001139	196:8	Lower half	1.43	NA	1.43
S97T001140	196:9	Lower half	1.39	NA	1.39

Note:

NA = not analyzed

Table B2-77. Tank 241-AW-105 Analytical Results: Specific Gravity.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Liquids			unitless	unitless	unitless
S97T001112	195:4	Drainable liquid	1.07	1.06	1.07
S97T001153	196:4	Drainable liquid	1.07	1.07	1.07

Table B2-78. Tank 241-AW-105 Analytical Results: pH Measurement.

Sample Number	Sample Location	Sample Portion	Result	Duplicate	Mean
Solids			**unitless**	**unitless**	**unitless**
S97T001106	195:4	Lower half	13.2	13.2	13.2
S97T001101	195:5	Upper half	12.2	12.2	12.2
S97T001107		Lower half	12.4	12.4	12.4
S97T001102	195:6	Upper half	12.5	12.5	12.5
S97T001108		Lower half	12.3	12.3	12.3
S97T001103	195:7	Upper half	12.6	12.5	12.5
S97T001109		Lower half	12.5	12.5	12.5
S97T001104	195:8	Upper half	12.5	12.5	12.5
S97T001110		Lower half	12.5	12.5	12.5
S97T001105	195:9	Upper half	12.4	12.4	12.4
S97T001111		Lower half	12.3	12.2	12.2
S97T001147	196:4	Lower half	12.5	12.5	12.5
S97T001142	196:5	Upper half	12.3	12.2	12.2
S97T001148		Lower half	11.5	11.6	11.6
S97T001143	196:6	Upper half	12.4	12.5	12.4
S97T001149		Lower half	11.6	11.9	11.7
S97T001144	196:7	Upper half	12.4	12.4	12.4
S97T001150		Lower half	12.4	12.4	12.4
S97T001145	196:8	Upper half	12.4	12.5	12.4
S97T001151		Lower half	12.4	12.4	12.4
S97T001146	196:9	Upper half	12.4	12.4	12.4
S97T001152		Lower half	12.0	12.0	12.0
Liquids			**unitless**	**unitless**	**unitless**
S97T001496	195:4	Drainable liquid	13.0	13.0	13.0
S97T001498	196:4	Drainable liquid	13.0	13.0	13.0

1996 GRAB DATA TABLES

Table B2-79. 1996 Grab Sample Results for Tank 241-AW-105: Nondetected Analytes.[1]

Analyte	Highest Non-Detected Value		
	Supernatant (µg/mL)	Interstitial Liquid (µg/mL)	Centrifuged Solids (µg/mL)
Arsenic	<4.10	<10.1	<3,630
Barium	<2.05	<5.05	<1,810
Bismuth	<4.10	<10.1	<3,630
Cerium	<4.10	<10.1	<3,630
Cobalt	<0.820	<2.02	<726
Copper	<0.410	<1.01	<363
Lead	<4.10	<10.1	<3,630
Neodymium	<4.10	<10.1	<3,630
Samarium	<4.10	<10.1	<3,630
Selenium	<4.10	<10.1	<3,630
Strontium	<0.410	<1.01	<363
Thallium	<8.20	<20.2	<7,260
Titanium	<0.410	<1.01	<363
Vanadium	<2.05	<5.05	<1,810
Bromide	<644	<265	<1,220

Note:

[1]Esch (1997)

Table B2-80. 1996 Grab Sample Results for Tank 241-AW-105: Aluminum.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	15.6	16.1	15.85
S96T005005	5AW-96-2	10A	137	16.5	16.9	16.7
S96T005006	5AW-96-4	10A	118	17.4	17	17.2
S96T005010	5AW-96-10	15A	155	16	16.2	16.1
S96T005011	5AW-96-11	15A	137	16.9	16.9	16.9
S96T005012	5AW-96-14	15A	118	88.3	89.1	88.7
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	129	135	132
S96T005050	5AW-96-7	10A	78	696	713	704.5
S96T005051	5AW-96-9	10A	77	660	667	663.5
S96T005081	5AW-96-15	15A	95	464	461	462.5
S96T005082	5AW-96-17	15A	73	702	707	704.5
S96T005083	5AW-96-20	15A	66	588	591	589.5
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005052	5AW-96-5	10A	95	<1,780	<1,810	<1,800
S96T005053	5AW-96-7	10A	78	1,220	999	1,110
S96T005054	5AW-96-9	10A	77	1,030	1,390	1,210[QC:e]
S96T005084	5AW-96-15	15A	95	1,050	1,150	1,100
S96T005085	5AW-96-17	15A	73	1,690	1,670	1,680
S96T005086	5AW-96-20	15A	66	1,130	1,170	1,150

Table B2-81. 1996 Grab Sample Results for Tank 241-AW-105: Antimony.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<2.460	<2.46	<2.46
S96T005005	5AW-96-2	10A	137	<2.460	<2.46	<2.46
S96T005006	5AW-96-4	10A	118	<2.460	<2.46	<2.46
S96T005010	5AW-96-10	15A	155	<2.460	<2.46	<2.46
S96T005011	5AW-96-11	15A	137	<2.460	<2.46	<2.46
S96T005012	5AW-96-14	15A	118	<2.460	<2.46	<2.46
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<6.060	<6.06	<6.06
S96T005050	5AW-96-7	10A	78	<6.060	<6.06	<6.06
S96T005051	5AW-96-9	10A	77	<6.060	<6.06	<6.06
S96T005081	5AW-96-15	15A	95	<6.060	<6.06	<6.06
S96T005082	5AW-96-17	15A	73	<6.060	<6.06	<6.06
S96T005083	5AW-96-20	15A	66	<6.060	<6.06	<6.06
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<2,130	2,660	<2,400
S96T005053	5AW-96-7	10A	78	<1,160	1,300	<1,230
S96T005054	5AW-96-9	10A	77	<1,210	1,470	<1,340
S96T005084	5AW-96-15	15A	95	<1,160	<1,200	<1,180
S96T005085	5AW-96-17	15A	73	<1,190	<1,210	<1,200
S96T005086	5AW-96-20	15A	66	<1,220	<1,200	<1,210

Table B2-82. 1996 Grab Sample Results for Tank 241-AW-105: Beryllium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<0.205	<0.205	<0.205
S96T005005	5AW-96-2	10A	137	<0.205	<0.205	<0.205
S96T005006	5AW-96-4	10A	118	<0.205	<0.205	<0.205
S96T005010	5AW-96-10	15A	155	<0.205	<0.205	<0.205
S96T005011	5AW-96-11	15A	137	<0.205	<0.205	<0.205
S96T005012	5AW-96-14	15A	118	<0.205	<0.205	<0.205
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<0.505	<0.505	<0.505
S96T005050	5AW-96-7	10A	78	1.36	1.38	1.37
S96T005051	5AW-96-9	10A	77	1.2	1.21	1.205
S96T005081	5AW-96-15	15A	95	<0.505	<0.505	<0.505
S96T005082	5AW-96-17	15A	73	1.03	1.04	1.035
S96T005083	5AW-96-20	15A	66	0.995	1.01	1.002
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<178	<181	<180
S96T005053	5AW-96-7	10A	78	<96.90	<97.0	<97.0
S96T005054	5AW-96-9	10A	77	<101	<102	<102
S96T005084	5AW-96-15	15A	95	<96.70	<100	<98.4
S96T005085	5AW-96-17	15A	73	<98.80	<101	<99.9
S96T005086	5AW-96-20	15A	66	<102	<99.7	<101

Table B2-83. 1996 Grab Sample Results for Tank 241-AW-105: Boron.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	3.18	3.24	3.21
S96T005005	5AW-96-2	10A	137	5.44	5.46	5.45
S96T005006	5AW-96-4	10A	118	2.98	2.86	2.92
S96T005010	5AW-96-10	15A	155	2.85	2.87	2.86
S96T005011	5AW-96-11	15A	137	2.68	2.66	2.67
S96T005012	5AW-96-14	15A	118	2.68	2.83	2.755
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	9.1	9.19	9.145
S96T005050	5AW-96-7	10A	78	5.93	6.18	6.055
S96T005051	5AW-96-9	10A	77	<5.050	<5.05	<5.05
S96T005081	5AW-96-15	15A	95	<5.050	<5.05	<5.05
S96T005082	5AW-96-17	15A	73	<5.050	<5.05	<5.05
S96T005083	5AW-96-20	15A	66	<5.050	<5.05	<5.05
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<1,780	<1,810	<1,800
S96T005053	5AW-96-7	10A	78	<969	<970	<970
S96T005054	5AW-96-9	10A	77	<1,010	<1,020	<1,020
S96T005084	5AW-96-15	15A	95	<967	<1,000	<984
S96T005085	5AW-96-17	15A	73	<988	<1,010	<999
S96T005086	5AW-96-20	15A	66	<1,020	<997	<1,010

Table B2-84. 1996 Grab Sample Results for Tank 241-AW-105: Cadmium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	<0.205	<0.205	<0.205
S96T005005	5AW-96-2	10A	137	<0.205	<0.205	<0.205
S96T005006	5AW-96-4	10A	118	<0.205	<0.205	<0.205
S96T005010	5AW-96-10	15A	155	<0.205	<0.205	<0.205
S96T005011	5AW-96-11	15A	137	<0.205	<0.205	<0.205
S96T005012	5AW-96-14	15A	118	<0.205	<0.205	<0.205
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	<0.505	0.717	<0.611
S96T005050	5AW-96-7	10A	78	<0.505	<0.505	<0.505
S96T005051	5AW-96-9	10A	77	<0.505	<0.505	<0.505
S96T005081	5AW-96-15	15A	95	<0.505	<0.505	<0.505
S96T005082	5AW-96-17	15A	73	<0.505	<0.505	<0.505
S96T005083	5AW-96-20	15A	66	<0.505	<0.505	<0.505
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005052	5AW-96-5	10A	95	<178	<181	<180
S96T005053	5AW-96-7	10A	78	110	<97.0	<104
S96T005054	5AW-96-9	10A	77	<101	126	<114
S96T005084	5AW-96-15	15A	95	249	262	255.5
S96T005085	5AW-96-17	15A	73	104	107	105.5
S96T005086	5AW-96-20	15A	66	238	246	242

Table B2-85. 1996 Grab Sample Results for Tank 241-AW-105: Calcium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<4.100	<4.10	<4.10
S96T005005	5AW-96-2	10A	137	6.18	6.23	6.205
S96T005006	5AW-96-4	10A	118	<4.100	<4.10	<4.10
S96T005010	5AW-96-10	15A	155	<4.100	<4.10	<4.10
S96T005011	5AW-96-11	15A	137	4.17	4.19	4.18
S96T005012	5AW-96-14	15A	118	<4.100	<4.10	<4.10
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	16.6	96.9	56.75
S96T005050	5AW-96-7	10A	78	<10.10	<10.1	<10.1
S96T005051	5AW-96-9	10A	77	<10.10	<10.1	<10.1
S96T005081	5AW-96-15	15A	95	<10.10	<10.1	<10.1
S96T005082	5AW-96-17	15A	73	<10.10	<10.1	<10.1
S96T005083	5AW-96-20	15A	66	<10.10	<10.1	<10.1
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	9,410	9,180	9,300
S96T005053	5AW-96-7	10A	78	<1,940	<1,940	<1,940
S96T005054	5AW-96-9	10A	77	<2,010	<2,050	<2,030
S96T005084	5AW-96-15	15A	95	<1,930	<2,000	<1,970
S96T005085	5AW-96-17	15A	73	<1,980	<2,020	<2,000
S96T005086	5AW-96-20	15A	66	<2,030	<1,990	<2,010

Table B2-86. 1996 Grab Sample Results for Tank 241-AW-105: Chromium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	0.640	0.573	0.607
S96T005005	5AW-96-2	10A	137	0.615	0.631	0.623
S96T005006	5AW-96-4	10A	118	0.651	0.652	0.651
S96T005010	5AW-96-10	15A	155	0.610	0.648	0.629
S96T005011	5AW-96-11	15A	137	0.653	0.643	0.648
S96T005012	5AW-96-14	15A	118	3.99	4.05	4.02
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	6.72	8.54	7.63[QC:e]
S96T005050	5AW-96-7	10A	78	28.1	28.6	28.35
S96T005051	5AW-96-9	10A	77	30.4	30.5	30.45
S96T005081	5AW-96-15	15A	95	15.2	15.1	15.15
S96T005082	5AW-96-17	15A	73	32.6	33.3	32.95
S96T005083	5AW-96-20	15A	66	35.3	35.7	35.5
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005052	5AW-96-5	10A	95	<355	<363	<359
S96T005053	5AW-96-7	10A	78	231	<194	<213
S96T005054	5AW-96-9	10A	77	<201	267	<234
S96T005084	5AW-96-15	15A	95	202	<200	<201
S96T005085	5AW-96-17	15A	73	752	712	732
S96T005086	5AW-96-20	15A	66	214	203	208.5

Table B2-87. 1996 Grab Sample Results for Tank 241-AW-105: Iron.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<2.050	<2.05	<2.05
S96T005005	5AW-96-2	10A	137	<2.050	<2.05	<2.05
S96T005006	5AW-96-4	10A	118	<2.050	<2.05	<2.05
S96T005010	5AW-96-10	15A	155	<2.050	<2.05	<2.05
S96T005011	5AW-96-11	15A	137	<2.050	<2.05	<2.05
S96T005012	5AW-96-14	15A	118	<2.050	<2.05	<2.05
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<5.050	34.9	<20.0
S96T005050	5AW-96-7	10A	78	<5.050	<5.05	<5.05
S96T005051	5AW-96-9	10A	77	<5.050	<5.05	<5.05
S96T005081	5AW-96-15	15A	95	<5.050	<5.05	<5.05
S96T005082	5AW-96-17	15A	73	<5.050	<5.05	<5.05
S96T005083	5AW-96-20	15A	66	<5.050	<5.05	<5.05
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	3,710	3,770	3,740
S96T005053	5AW-96-7	10A	78	1,270	3,260	2,260[QC:e]
S96T005054	5AW-96-9	10A	77	1,340	1,350	1,340
S96T005084	5AW-96-15	15A	95	1,810	2,890	2,350[QC:e]
S96T005085	5AW-96-17	15A	73	4,850	4,300	4,580
S96T005086	5AW-96-20	15A	66	2,060	1,300	1,680[QC:e]

Table B2-88. 1996 Grab Sample Results for Tank 241-AW-105: Lanthanum.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005004	5AW-96-1	10A	155	<2.050	<2.05	<2.05
S96T005005	5AW-96-2	10A	137	<2.050	<2.05	<2.05
S96T005006	5AW-96-4	10A	118	<2.050	<2.05	<2.05
S96T005010	5AW-96-10	15A	155	<2.050	<2.05	<2.05
S96T005011	5AW-96-11	15A	137	<2.050	<2.05	<2.05
S96T005012	5AW-96-14	15A	118	<2.050	<2.05	<2.05
Interstitial Liquid			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005049	5AW-96-5	10A	95	<5.050	<5.05	<5.05
S96T005050	5AW-96-7	10A	78	<5.050	5.95	<5.50
S96T005051	5AW-96-9	10A	77	<5.050	<5.05	<5.05
S96T005081	5AW-96-15	15A	95	<5.050	<5.05	<5.05
S96T005082	5AW-96-17	15A	73	<5.050	<5.05	<5.05
S96T005083	5AW-96-20	15A	66	<5.050	<5.05	<5.05
Centrifuged Solids			**in.**	**µg/g**	**µg/g**	**µg/g**
S96T005052	5AW-96-5	10A	95	<1,780	<1,810	<1,800
S96T005053	5AW-96-7	10A	78	1,560	1,580	1,570
S96T005054	5AW-96-9	10A	77	1,470	1,460	1,460
S96T005084	5AW-96-15	15A	95	1,050	1,150	1,100
S96T005085	5AW-96-17	15A	73	2,370	2,200	2,280
S96T005086	5AW-96-20	15A	66	1,070	1,010	1,040

Table B2-89. 1996 Grab Sample Results for Tank 241-AW-105: Lithium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<0.410	<0.410	<0.410
S96T005005	5AW-96-2	10A	137	<0.410	<0.410	<0.410
S96T005006	5AW-96-4	10A	118	<0.410	<0.410	<0.410
S96T005010	5AW-96-10	15A	155	<0.410	<0.410	<0.410
S96T005011	5AW-96-11	15A	137	<0.410	<0.410	<0.410
S96T005012	5AW-96-14	15A	118	<0.410	<0.410	<0.410
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<1.010	<1.01	<1.01
S96T005050	5AW-96-7	10A	78	<1.010	<1.01	<1.01
S96T005051	5AW-96-9	10A	77	<1.010	<1.01	<1.01
S96T005081	5AW-96-15	15A	95	<1.010	<1.01	<1.01
S96T005082	5AW-96-17	15A	73	<1.010	<1.01	<1.01
S96T005083	5AW-96-20	15A	66	<1.010	<1.01	<1.01
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	355	<363	<359
S96T005053	5AW-96-7	10A	78	194	<194	<194
S96T005054	5AW-96-9	10A	77	201	<205	<203
S96T005084	5AW-96-15	15A	95	193	<200	<197
S96T005085	5AW-96-17	15A	73	198	<202	<200
S96T005086	5AW-96-20	15A	66	203	<199	<201

Table B2-90. 1996 Grab Sample Results for Tank 241-AW-105: Magnesium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	<4.100	<4.10	<4.10
S96T005005	5AW-96-2	10A	137	<4.100	<4.10	<4.10
S96T005006	5AW-96-4	10A	118	<4.100	<4.10	<4.10
S96T005010	5AW-96-10	15A	155	<4.100	<4.10	<4.10
S96T005011	5AW-96-11	15A	137	<4.100	<4.10	<4.10
S96T005012	5AW-96-14	15A	118	<4.100	<4.10	<4.10
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	<10.10	<10.1	<10.1
S96T005050	5AW-96-7	10A	78	<10.10	<10.1	<10.1
S96T005051	5AW-96-9	10A	77	<10.10	<10.1	<10.1
S96T005081	5AW-96-15	15A	95	<10.10	<10.1	<10.1
S96T005082	5AW-96-17	15A	73	<10.10	<10.1	<10.1
S96T005083	5AW-96-20	15A	66	<10.10	<10.1	<10.1
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005052	5AW-96-5	10A	95	3,550	<3,630	<3,590
S96T005053	5AW-96-7	10A	78	1,940	<1,940	<1,940
S96T005054	5AW-96-9	10A	77	2,010	<2,050	<2,030
S96T005084	5AW-96-15	15A	95	1,930	<2,000	<1,970
S96T005085	5AW-96-17	15A	73	1,980	<2,020	<2,000
S96T005086	5AW-96-20	15A	66	2,030	<1,990	<2,010

Table B2-91. 1996 Grab Sample Results for Tank 241-AW-105: Manganese.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<0.410	<0.410	<0.410
S96T005005	5AW-96-2	10A	137	<0.410	<0.410	<0.410
S96T005006	5AW-96-4	10A	118	<0.410	<0.410	<0.410
S96T005010	5AW-96-10	15A	155	<0.410	<0.410	<0.410
S96T005011	5AW-96-11	15A	137	<0.410	<0.410	<0.410
S96T005012	5AW-96-14	15A	118	<0.410	<0.410	<0.410
Interstitial Liquid			in.	g/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<1.010	1.51	<1.26
S96T005050	5AW-96-7	10A	78	<1.010	<1.01	<1.01
S96T005051	5AW-96-9	10A	77	<1.010	<1.01	<1.01
S96T005081	5AW-96-15	15A	95	<1.010	<1.01	<1.01
S96T005082	5AW-96-17	15A	73	1.09	<1.01	<1.05
S96T005083	5AW-96-20	15A	66	<1.010	<1.01	<1.01
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<355	<363	<359
S96T005053	5AW-96-7	10A	78	988	967	977.5
S96T005054	5AW-96-9	10A	77	829	856	842.5
S96T005084	5AW-96-15	15A	95	752	789	770.5
S96T005085	5AW-96-17	15A	73	4,280	4,000	4,140
S96T005086	5AW-96-20	15A	66	740	745	742.5

Table B2-92. 1996 Grab Sample Results for Tank 241-AW-105: Molybdenum.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	<2.050	<2.05	<2.05
S96T005005	5AW-96-2	10A	137	<2.050	<2.05	<2.05
S96T005006	5AW-96-4	10A	118	<2.050	<2.05	<2.05
S96T005010	5AW-96-10	15A	155	<2.050	<2.05	<2.05
S96T005011	5AW-96-11	15A	137	<2.050	<2.05	<2.05
S96T005012	5AW-96-14	15A	118	<2.050	<2.05	<2.05
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	<5.050	<5.05	<5.05
S96T005050	5AW-96-7	10A	78	<5.050	<5.05	<5.05
S96T005051	5AW-96-9	10A	77	<5.050	<5.05	<5.05
S96T005081	5AW-96-15	15A	95	<5.050	<5.05	<5.05
S96T005082	5AW-96-17	15A	73	<5.050	<5.05	<5.05
S96T005083	5AW-96-20	15A	66	<5.050	<5.05	<5.05
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	1,780	<1,810	<1,800
S96T005053	5AW-96-7	10A	78	969	<9,70	<970
S96T005054	5AW-96-9	10A	77	1,010	<1,020	<1,020
S96T005084	5AW-96-15	15A	95	967	<1,000	<984
S96T005085	5AW-96-17	15A	73	988	<1,010	<999
S96T005086	5AW-96-20	15A	66	1,020	<997	<1,010

Table B2-93. 1996 Grab Sample Results for Tank 241-AW-105: Nickel.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	<0.820	<0.820	<0.820
S96T005005	5AW-96-2	10A	137	<0.820	<0.820	<0.820
S96T005006	5AW-96-4	10A	118	<0.820	<0.820	<0.820
S96T005010	5AW-96-10	15A	155	<0.820	<0.820	<0.820
S96T005011	5AW-96-11	15A	137	<0.820	<0.820	<0.820
S96T005012	5AW-96-14	15A	118	<0.820	<0.820	<0.820
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	<2.020	<2.02	<2.02
S96T005050	5AW-96-7	10A	78	2.61	2.54	2.575
S96T005051	5AW-96-9	10A	77	2.4	<2.02	<2.21
S96T005081	5AW-96-15	15A	95	<2.020	<2.02	<2.02
S96T005082	5AW-96-17	15A	73	3.13	3.25	3.19
S96T005083	5AW-96-20	15A	66	<2.020	2.78	<2.40

Table B2-94. 1996 Grab Sample Results for Tank 241-AW-105: Phosphorus.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	14.4	13.8	14.1
S96T005005	5AW-96-2	10A	137	13.4	13.4	13.4
S96T005006	5AW-96-4	10A	118	12.9	13.7	13.3
S96T005010	5AW-96-10	15A	155	13.3	13	13.15
S96T005011	5AW-96-11	15A	137	11.6	12.3	11.95
S96T005012	5AW-96-14	15A	118	53.9	54.9	54.4
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	89.3	121	105.2[QC:e]
S96T005050	5AW-96-7	10A	78	443	448	445.5
S96T005051	5AW-96-9	10A	77	417	416	416.5
S96T005081	5AW-96-15	15A	95	250	247	248.5
S96T005082	5AW-96-17	15A	73	392	392	392
S96T005083	5AW-96-20	15A	66	387	393	390
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<7,110	<7,260	<7,190
S96T005053	5AW-96-7	10A	78	<3,880	<3,880	<3,880
S96T005054	5AW-96-9	10A	77	<4,030	<4,100	<4,070
S96T005084	5AW-96-15	15A	95	<3,870	<4,000	<3,940
S96T005085	5AW-96-17	15A	73	<3,950	<4,040	<4,000
S96T005086	5AW-96-20	15A	66	<4,070	<3,990	<4,030

Table B2-95. 1996 Grab Sample Results for Tank 241-AW-105: Potassium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005004	5AW-96-1	10A	155	1,230	1,260	1,240[QC:d]
S96T005005	5AW-96-2	10A	137	1,270	1,290	1,280[QC:d]
S96T005006	5AW-96-4	10A	118	1,320	1,320	1,320
S96T005010	5AW-96-10	15A	155	1,270	1,270	1,270
S96T005011	5AW-96-11	15A	137	1,310	1,310	1,310
S96T005012	5AW-96-14	15A	118	3,330	3,360	3,340[QC:d]
Interstitial Liquid			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005049	5AW-96-5	10A	95	4,150	4,150	4,150
S96T005050	5AW-96-7	10A	78	10,800	11,100	11,000[QC:d]
S96T005051	5AW-96-9	10A	77	10,200	10,400	10,300[QC:d]
S96T005081	5AW-96-15	15A	95	7,360	7,360	7,360[QC:c]
S96T005082	5AW-96-17	15A	73	10,400	10,500	10,400[QC:c]
S96T005083	5AW-96-20	15A	66	9,290	9,370	9,330[QC:c]

Table B2-96. 1996 Grab Sample Results for Tank 241-AW-105: Silicon.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	45.6	46.3	45.95
S96T005005	5AW-96-2	10A	137	51.3	51.5	51.4
S96T005006	5AW-96-4	10A	118	47.7	47.4	47.55
S96T005010	5AW-96-10	15A	155	39.6	40.1	39.85
S96T005011	5AW-96-11	15A	137	39.1	39	39.05
S96T005012	5AW-96-14	15A	118	47.2	48.3	47.75
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	94.9	113	104
S96T005050	5AW-96-7	10A	78	56.9	58.6	57.75
S96T005051	5AW-96-9	10A	77	52.4	55.2	53.8
S96T005081	5AW-96-15	15A	95	31	35.8	33.4
S96T005082	5AW-96-17	15A	73	49.2	53	51.1
S96T005083	5AW-96-20	15A	66	52.5	56	54.25
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	1,830	<1,810	<1,820
S96T005053	5AW-96-7	10A	78	1,030	1,180	1,100
S96T005054	5AW-96-9	10A	77	1,010	<1,020	<1,020
S96T005084	5AW-96-15	15A	95	<967	<1,000	<984
S96T005085	5AW-96-17	15A	73	1,230	1,280	1,260
S96T005086	5AW-96-20	15A	66	<1,020	<997	<1,010

Table B2-97. 1996 Grab Sample Results for Tank 241-AW-105: Silver.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	.994	1.02	1.007
S96T005005	5AW-96-2	10A	137	1.07	1.12	1.095
S96T005006	5AW-96-4	10A	118	1.14	1.06	1.1
S96T005010	5AW-96-10	15A	155	1.04	1.07	1.055
S96T005011	5AW-96-11	15A	137	1.16	1.15	1.155
S96T005012	5AW-96-14	15A	118	1.55	1.5	1.525
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	1.26	1.62	1.44[QC:e]
S96T005050	5AW-96-7	10A	78	2.73	2.82	2.775
S96T005051	5AW-96-9	10A	77	2.61	2.62	2.615
S96T005081	5AW-96-15	15A	95	2.08	1.9	1.99
S96T005082	5AW-96-17	15A	73	2.65	2.68	2.665
S96T005083	5AW-96-20	15A	66	2.67	2.63	2.65
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005052	5AW-96-5	10A	95	<355	<363	<359
S96T005053	5AW-96-7	10A	78	424	366	395
S96T005054	5AW-96-9	10A	77	342	421	381.5[QC:e]
S96T005084	5AW-96-15	15A	95	<193	<200	<197
S96T005085	5AW-96-17	15A	73	320	296	308
S96T005086	5AW-96-20	15A	66	<203	<199	<201

Table B2-98. 1996 Grab Sample Results for Tank 241-AW-105: Sodium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005004	5AW-96-1	10A	155	12,600	12,700	12,600[QC:d]
S96T005005	5AW-96-2	10A	137	12,700	12,900	12,800[QC:d]
S96T005006	5AW-96-4	10A	118	13,000	13,000	13,000[QC:c]
S96T005010	5AW-96-10	15A	155	12,700	12,800	12,800
S96T005011	5AW-96-11	15A	137	12,900	12,900	12,900[QC:c]
S96T005012	5AW-96-14	15A	118	18,700	18,800	18,800[QC:d]
Interstitial Liquid			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005049	5AW-96-5	10A	95	21,300	21,100	21,200[QC:c]
S96T005050	5AW-96-7	10A	78	36,600	37,600	37,100[QC:d]
S96T005051	5AW-96-9	10A	77	37,100	37,400	37,200[QC:d]
S96T005081	5AW-96-15	15A	95	27,700	27,700	27,700[QC:c]
S96T005082	5AW-96-17	15A	73	36,900	37,100	37,000[QC:c]
S96T005083	5AW-96-20	15A	66	36,700	36,800	36,800[QC:c]
Centrifuged Solids			**in.**	**μg/g**	**μg/g**	**μg/g**
S96T005052	5AW-96-5	10A	95	78,000	78,800	78,400
S96T005053	5AW-96-7	10A	78	98,700	91,400	95,000
S96T005054	5AW-96-9	10A	77	91,400	90,800	91,100
S96T005084	5AW-96-15	15A	95	62,000	62,900	62,400
S96T005085	5AW-96-17	15A	73	80,400	78,400	79,400
S96T005086	5AW-96-20	15A	66	67,500	71,600	69,600

Table B2-99. 1996 Grab Sample Results for Tank 241-AW-105: Sulfur.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	46	46.5	46.25
S96T005005	5AW-96-2	10A	137	45.9	46	45.95
S96T005006	5AW-96-4	10A	118	46.7	46.5	46.6
S96T005010	5AW-96-10	15A	155	46.5	45.9	46.2
S96T005011	5AW-96-11	15A	137	47.2	47.4	47.3
S96T005012	5AW-96-14	15A	118	94	94.9	94.45
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	147	153	150
S96T005050	5AW-96-7	10A	78	586	591	588.5
S96T005051	5AW-96-9	10A	77	540	543	541.5
S96T005081	5AW-96-15	15A	95	351	348	349.5
S96T005082	5AW-96-17	15A	73	531	531	531
S96T005083	5AW-96-20	15A	66	457	459	458
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005052	5AW-96-5	10A	95	<3,550	<3,630	<3,590
S96T005053	5AW-96-7	10A	78	<1,940	<1,940	<1,940
S96T005054	5AW-96-9	10A	77	<2,010	<2,050	<2,030
S96T005084	5AW-96-15	15A	95	<1,930	<2,000	<1,970
S96T005085	5AW-96-17	15A	73	<1,980	<2,020	<2,000
S96T005086	5AW-96-20	15A	66	<2,030	<1,990	<2,010

Table B2-100. 1996 Grab Sample Results for Tank 241-AW-105: Uranium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005004	5AW-96-1	10A	155	<20.50	<20.5	<20.5
S96T005005	5AW-96-2	10A	137	<20.50	<20.5	<20.5
S96T005006	5AW-96-4	10A	118	<20.50	<20.5	<20.5
S96T005010	5AW-96-10	15A	155	<20.50	<20.5	<20.5
S96T005011	5AW-96-11	15A	137	<20.50	<20.5	<20.5
S96T005012	5AW-96-14	15A	118	<20.50	<20.5	<20.5
Interstitial Liquid			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005049	5AW-96-5	10A	95	76.7	464	270.4
S96T005050	5AW-96-7	10A	78	123	151	137[QC:e]
S96T005051	5AW-96-9	10A	77	<50.50	<50.5	<50.5
S96T005081	5AW-96-15	15A	95	58.4	<50.5	<54.5
S96T005082	5AW-96-17	15A	73	78.9	55.8	67.35[QC:e]
S96T005083	5AW-96-20	15A	66	<50.50	<50.5	<50.5
Centrifuged Solids			**in.**	**μg/g**	**μg/g**	**μg/g**
S96T005052	5AW-96-5	10A	95	61,700	56,300	59,000
S96T005053	5AW-96-7	10A	78	42,900	44,700	43,800
S96T005054	5AW-96-9	10A	77	56,000	53,000	54,500
S96T005084	5AW-96-15	15A	95	92,700	97,500	95,100
S96T005085	5AW-96-17	15A	73	43,900	41,800	42,800
S96T005086	5AW-96-20	15A	66	94,300	94,600	94,400

Table B2-101. 1996 Grab Sample Results for Tank 241-AW-105: Zinc.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005004	5AW-96-1	10A	155	1.29	1.28	1.285
S96T005005	5AW-96-2	10A	137	1.57	1.58	1.575
S96T005006	5AW-96-4	10A	118	1.34	1.32	1.33
S96T005010	5AW-96-10	15A	155	2.61	2.67	2.64
S96T005011	5AW-96-11	15A	137	2.82	2.8	2.81
S96T005012	5AW-96-14	15A	118	4.77	4.83	4.8
Interstitial Liquid			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005049	5AW-96-5	10A	95	5.88	7.05	6.465
S96T005050	5AW-96-7	10A	78	6.97	7.18	7.075
S96T005051	5AW-96-9	10A	77	10.3	10.3	10.3
S96T005081	5AW-96-15	15A	95	3.75	3.7	3.725
S96T005082	5AW-96-17	15A	73	3.82	3.96	3.89
S96T005083	5AW-96-20	15A	66	3.69	3.67	3.68
Centrifuged Solids			**in.**	**µg/g**	**µg/g**	**µg/g**
S96T005052	5AW-96-5	10A	95	<355	913	<634
S96T005053	5AW-96-7	10A	78	258	403	330.5[QC:e]
S96T005054	5AW-96-9	10A	77	561	258	409.5[QC:e]
S96T005084	5AW-96-15	15A	95	<193	<200	<197
S96T005085	5AW-96-17	15A	73	<198	<202	<200
S96T005086	5AW-96-20	15A	66	<203	<199	<201

Table B2-102. 1996 Grab Sample Results for Tank 241-AW-105: Zirconium.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005004	5AW-96-1	10A	155	<0.410	<0.410	<0.410
S96T005005	5AW-96-2	10A	137	<0.410	<0.410	<0.410
S96T005006	5AW-96-4	10A	118	<0.410	<0.410	<0.410
S96T005010	5AW-96-10	15A	155	<0.410	<0.410	<0.410
S96T005011	5AW-96-11	15A	137	<0.410	<0.410	<0.410
S96T005012	5AW-96-14	15A	118	<0.410	<0.410	<0.410
Interstitial Liquid			**in.**	**µg/mL**	**µg/mL**	**µg/mL**
S96T005049	5AW-96-5	10A	95	1.59	12.5	7.045
S96T005050	5AW-96-7	10A	78	49.5	62.5	56[QC:e]
S96T005051	5AW-96-9	10A	77	13.7	6.72	10.21[QC:e]
S96T005081	5AW-96-15	15A	95	4.21	2.46	3.335[QC:e]
S96T005082	5AW-96-17	15A	73	18.9	13.3	16.1[QC:e]
S96T005083	5AW-96-20	15A	66	4.71	2.22	3.465[QC:e]
Centrifuged Solids			**in.**	**µg/g**	**µg/g**	**µg/g**
S96T005052	5AW-96-5	10A	95	583	558	570.5
S96T005053	5AW-96-7	10A	78	84,400	84,000	84,200
S96T005054	5AW-96-9	10A	77	69,300	69,800	69,600
S96T005084	5AW-96-15	15A	95	17,000	16,300	16,600
S96T005085	5AW-96-17	15A	73	78,900	76,700	77,800
S96T005086	5AW-96-20	15A	66	16,000	18,300	17,200

Table B2-103. 1996 Grab Sample Results for Tank 241-AW-105: Chloride.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	222	230	225.8
S96T005006	5AW-96-4	10A	137	221	216	218.3
S96T005008	5AW-96-2	10A	118	262	231	246.6
S96T005010	5AW-96-10	15A	155	214	210	211.8
S96T005011	5AW-96-11	15A	137	252	248	249.8
S96T005012	5AW-96-14	15A	118	308	307	307.4
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	248	257	252.3
S96T005050	5AW-96-7	10A	78	315	312	313.4
S96T005051	5AW-96-9	10A	77	399	420	409.4
S96T005081	5AW-96-15	15A	95	398	393	395.6
S96T005082	5AW-96-17	15A	73	324	323	323.6
S96T005083	5AW-96-20	15A	66	296	298	296.8
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005055	5AW-96-5	10A	95	208	203	205.6
S96T005056	5AW-96-7	10A	78	175	<166	<171
S96T005057	5AW-96-9	10A	77	186	208	196.8
S96T005087	5AW-96-15	15A	95	221	228	224.4
S96T005088	5AW-96-17	15A	73	113	120	116.5
S96T005089	5AW-96-20	15A	66	272	365	318.6[QC:e]

Table B2-104. 1996 Grab Sample Results for Tank 241-AW-105: Fluoride.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	159	127	142.9[QC:e]
S96T005006	5AW-96-4	10A	137	174	166	170.2
S96T005008	5AW-96-2	10A	118	155	154	154.3
S96T005010	5AW-96-10	15A	155	131	129	129.9
S96T005011	5AW-96-11	15A	137	159	153	156.2
S96T005012	5AW-96-14	15A	118	1,060	1,160	1,110
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	1,510	1,490	1,500
S96T005050	5AW-96-7	10A	78	9,610	9,610	9,610
S96T005051	5AW-96-9	10A	77	12,500	12,600	12,600
S96T005081	5AW-96-15	15A	95	4,230	4,230	4,230
S96T005082	5AW-96-17	15A	73	10,400	10,500	10,500
S96T005083	5AW-96-20	15A	66	9,890	9,810	9,850
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005055	5AW-96-5	10A	95	1,410	1,380	1,400
S96T005056	5AW-96-7	10A	78	38,400	34,800	36,600
S96T005057	5AW-96-9	10A	77	28,200	28,600	28,400
S96T005087	5AW-96-15	15A	95	4,030	4,110	4,070
S96T005088	5AW-96-17	15A	73	20,200	19,900	20,000
S96T005089	5AW-96-20	15A	66	4,150	4,230	4,190

Table B2-105. 1996 Grab Sample Results for Tank 241-AW-105: Nitrate.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005004	5AW-96-1	10A	155	23,900	24,100	24,000
S96T005006	5AW-96-4	10A	137	24,100	24,100	24,100
S96T005008	5AW-96-2	10A	118	24,300	24,600	24,500[QC:d]
S96T005010	5AW-96-10	15A	155	24,600	24,800	24,700
S96T005011	5AW-96-11	15A	137	29,200	28,500	28,800
S96T005012	5AW-96-14	15A	118	28,000	30,200	29,100
Interstitial Liquid			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005049	5AW-96-5	10A	95	33,900	33,500	33,700
S96T005050	5AW-96-7	10A	78	26,800	26,900	26,900
S96T005051	5AW-96-9	10A	77	27,700	28,100	27,900
S96T005081	5AW-96-15	15A	95	29,300	29,100	29,200
S96T005082	5AW-96-17	15A	73	27,000	26,900	27,000
S96T005083	5AW-96-20	15A	66	30,300	30,300	30,300
Centrifuged Solids			**in.**	**μg/g**	**μg/g**	**μg/g**
S96T005055	5AW-96-5	10A	95	26,200	26,400	26,300
S96T005056	5AW-96-7	10A	78	18,600	16,900	17,800
S96T005057	5AW-96-9	10A	77	18,300	18,300	18,300
S96T005087	5AW-96-15	15A	95	23,000	23,100	23,000
S96T005088	5AW-96-17	15A	73	18,800	18,500	18,700
S96T005089	5AW-96-20	15A	66	22,400	23,100	22,700

Table B2-106. 1996 Grab Sample Results for Tank 241-AW-105: Nitrite.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	1,090	1,120	1,100
S96T005006	5AW-96-4	10A	137	1,120	1,100	1,110
S96T005008	5AW-96-2	10A	118	1,200	1,130	1,170
S96T005010	5AW-96-10	15A	155	1,090	1,070	1,080
S96T005011	5AW-96-11	15A	137	1,280	1,250	1,270
S96T005012	5AW-96-14	15A	118	1,660	1,760	1,710
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	1,520	1,530	1,520
S96T005050	5AW-96-7	10A	78	4,640	4,640	4,640
S96T005051	5AW-96-9	10A	77	4,700	4,680	4,690
S96T005081	5AW-96-15	15A	95	3,010	2,930	2,970
S96T005082	5AW-96-17	15A	73	4,710	4,730	4,720
S96T005083	5AW-96-20	15A	66	3,940	3,920	3,930
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005055	5AW-96-5	10A	95	1,310	1,260	1,280
S96T005056	5AW-96-7	10A	78	3,680	3,520	3,600
S96T005057	5AW-96-9	10A	77	2,990	2,990	2,990
S96T005087	5AW-96-15	15A	95	2,220	2,280	2,250
S96T005088	5AW-96-17	15A	73	3,490	3,390	3,440
S96T005089	5AW-96-20	15A	66	2,520	2,600	2,560

Table B2-107. 1996 Grab Sample Results for Tank 241-AW-105: Oxalate.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	<63.63	<63.6	<63.6
S96T005006	5AW-96-4	10A	137	<63.63	<63.6	<63.6
S96T005008	5AW-96-2	10A	118	<117	<117	<117
S96T005010	5AW-96-10	15A	155	<117	<117	<117
S96T005011	5AW-96-11	15A	137	<117	<117	<117
S96T005012	5AW-96-14	15A	118	<541	<541	<541
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	<117	<117	<117
S96T005050	5AW-96-7	10A	78	320	311	315.6
S96T005051	5AW-96-9	10A	77	327	<223	<275
S96T005081	5AW-96-15	15A	95	196	232	213.9
S96T005082	5AW-96-17	15A	73	321	388	354.4
S96T005083	5AW-96-20	15A	66	272	287	279.6
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005055	5AW-96-5	10A	95	<193	<192	<193
S96T005056	5AW-96-7	10A	78	<1,020	<1,030	<1,030
S96T005057	5AW-96-9	10A	77	446	<415	<431
S96T005087	5AW-96-15	15A	95	236	<233	<235
S96T005088	5AW-96-17	15A	73	<512	<510	<511
S96T005089	5AW-96-20	15A	66	<517	<531	<524

Table B2-108. 1996 Grab Sample Results for Tank 241-AW-105: Phosphate.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µg/mL	µg/mL	µg/mL
S96T005004	5AW-96-1	10A	155	<72.05	<72.1	<72.1
S96T005006	5AW-96-4	10A	137	<72.05	<72.1	<72.1
S96T005008	5AW-96-2	10A	118	<133	<133	<133
S96T005010	5AW-96-10	15A	155	<133	<133	<133
S96T005011	5AW-96-11	15A	137	<133	<133	<133
S96T005012	5AW-96-14	15A	118	<618	<618	<618
Interstitial Liquid			in.	µg/mL	µg/mL	µg/mL
S96T005049	5AW-96-5	10A	95	<133	<133	<133
S96T005050	5AW-96-7	10A	78	289	324	306.6
S96T005051	5AW-96-9	10A	77	590	599	594.2
S96T005081	5AW-96-15	15A	95	228	223	225.4
S96T005082	5AW-96-17	15A	73	369	414	391.6
S96T005083	5AW-96-20	15A	66	393	404	398.6
Centrifuged Solids			in.	µg/g	µg/g	µg/g
S96T005055	5AW-96-5	10A	95	445	486	465.6
S96T005056	5AW-96-7	10A	78	<1,160	<1,170	<1,170
S96T005057	5AW-96-9	10A	77	<472	<474	<473
S96T005087	5AW-96-15	15A	95	411	378	394.7
S96T005088	5AW-96-17	15A	73	<585	<583	<584
S96T005089	5AW-96-20	15A	66	<591	<607	<599

Table B2-109. 1996 Grab Sample Results for Tank 241-AW-105: Sulfate.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005004	5AW-96-1	10A	155	167	166	166.3
S96T005006	5AW-96-4	10A	137	175	189	182.1
S96T005008	5AW-96-2	10A	118	230	225	227.5
S96T005010	5AW-96-10	15A	155	221	187	204.1
S96T005011	5AW-96-11	15A	137	214	214	213.8
S96T005012	5AW-96-14	15A	118	<711	<711	<711
Interstitial Liquid			**in.**	**μg/mL**	**μg/mL**	**μg/mL**
S96T005049	5AW-96-5	10A	95	412	399	405.2
S96T005050	5AW-96-7	10A	78	1,550	1,580	1,560
S96T005051	5AW-96-9	10A	77	1,610	1,650	1,630
S96T005081	5AW-96-15	15A	95	951	949	949.9
S96T005082	5AW-96-17	15A	73	1,540	1,490	1,510
S96T005083	5AW-96-20	15A	66	1,240	1,280	1,260
Centrifuged Solids			**in.**	**μg/g**	**μg/g**	**μg/g**
S96T005055	5AW-96-5	10A	95	434	415	424.5
S96T005056	5AW-96-7	10A	78	1,540	1,730	1,630
S96T005057	5AW-96-9	10A	77	1,190	1,260	1,220
S96T005087	5AW-96-15	15A	95	880	851	865.6
S96T005088	5AW-96-17	15A	73	1,680	1,690	1,680
S96T005089	5AW-96-20	15A	66	1,160	1,310	1,240

Table B2-110. 1996 Grab Sample Results for Tank 241-AW-105: Hydroxide.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg/mL	μg/mL	μg/mL
S96T005004	5AW-96-1	10A	155	3,270	3,370	3,320
S96T005006	5AW-96-4	10A	137	3,270	3,190	3,230
S96T005008	5AW-96-2	10A	118	3,680	3,890	3,780
S96T005010	5AW-96-10	15A	155	2,900	2,850	2,880
S96T005011	5AW-96-11	15A	137	3,150	3,370	3,260
S96T005012	5AW-96-14	15A	118	5,130	5,180	5,160
Interstitial Liquid			in.	μg/mL	μg/mL	μg/mL
S96T005049	5AW-96-5	10A	95	5,410	5,480	5,440
S96T005050	5AW-96-7	10A	78	8,640	8,530	8,580
S96T005051	5AW-96-9	10A	77	9,410	9,500	9,460
S96T005081	5AW-96-15	15A	95	7,620	7,440	7,530
S96T005082	5AW-96-17	15A	73	9,040	9,390	9,220
S96T005083	5AW-96-20	15A	66	8,660	9,070	8,860
Centrifuged Solids			in.	μg/g	μg/g	μg/g
S96T005055	5AW-96-5	10A	95	<42.00	<42	<42.0
S96T005056	5AW-96-7	10A	78	<42.00	<42	<42.0
S96T005057	5AW-96-9	10A	77	<42.00	<42	<42.0
S96T005087	5AW-96-15	15A	95	<42.00	<42	<42.0
S96T005088	5AW-96-17	15A	73	<42.00	<42	<42.0
S96T005089	5AW-96-20	15A	66	<42.00	<42	<42.0

Table B2-111. 1996 Grab Sample Results for Tank 241-AW-105: Polychlorinated Biphenyls.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result
Centrifuged Solids			in.	µg/g
S96T005046	5AW-96-5	10A	95	<0.993
S96T005047	5AW-96-7	10A	78	<0.888
S96T005048	5AW-96-9	10A	77	<0.955
S96T005078	5AW-96-15	15A	95	<0.903
S96T005079	5AW-96-17	15A	73	<0.897
S96T005080	5AW-96-20	15A	66	<0.855

Table B2-112. 1996 Grab Sample Results for Tank 241-AW-105: Total Inorganic Carbon.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μg C/mL**	**μg C/mL**	**μg C/mL**
S96T005004	5AW-96-1	10A	155	170	204	187
S96T005006	5AW-96-4	10A	137	178	193	185.5
S96T005008	5AW-96-2	10A	118	187	190	188.5
S96T005010	5AW-96-10	15A	155	432	437	434.5
S96T005011	5AW-96-11	15A	137	367	398	382.5
S96T005012	5AW-96-14	15A	118	437	484	460.5
Interstitial Liquid			**in.**	**μg C/mL**	**μg C/mL**	**μg C/mL**
S96T005049	5AW-96-5	10A	95	392	459	425.5
S96T005050	5AW-96-7	10A	78	850	841	845.5
S96T005051	5AW-96-9	10A	77	745	741	743
S96T005081	5AW-96-15	15A	95	576	586	581
S96T005082	5AW-96-17	15A	73	775	792	783.5
S96T005083	5AW-96-20	15A	66	676	686	681
Centrifuged Solids			**in.**	**μg C/g**	**μg C/g**	**μg C/g**
S96T005019	5AW-96-5	10A	95	1,120	1,090	1,100
S96T005020	5AW-96-7	10A	78	969	870	919.5
S96T005021	5AW-96-9	10A	77	921	827	874
S96T005075	5AW-96-15	15A	95	630	676	653
S96T005076	5AW-96-17	15A	73	808	812	810
S96T005077	5AW-96-20	15A	66	635	766	700.5

Table B2-113. 1996 Grab Sample Results for Tank 241-AW-105: Total Organic Carbon.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μg C/mL	μg C/mL	μg C/mL
S96T005004	5AW-96-1	10A	155	4,540	4,700	4,620
S96T005008	5AW-96-2	10A	118	97.9	102	99.95
S96T005008	5AW-96-2	10A	118	108	99.6	103.8
S96T005006	5AW-96-4	10A	137	4,590	5,080	4,840
S96T005010	5AW-96-10	15A	155	1,510	1,530	1,520
S96T005011	5AW-96-11	15A	137	1,440	1,420	1,430
S96T005012	5AW-96-14	15A	118	1,670	1,710	1,690
Interstitial Liquid			in.	μg C/mL	μg C/mL	μg C/mL
S96T005049	5AW-96-5	10A	95	951	589 (539)[1]	693$^{QC:e}$
S96T005049	5AW-96-5	10A	95	704	704	704
S96T005050	5AW-96-7	10A	78	2,570	2,510	2,540
S96T005051	5AW-96-9	10A	77	2,240	2,180	2,210
S96T005081	5AW-96-15	15A	95	1,770	1,570	1,670
S96T005082	5AW-96-17	15A	73	2,290	2,250	2,270
S96T005083	5AW-96-20	15A	66	1,920	1,820	1,870
Centrifuged Solids			in.	μg C/g	μg C/g	μg C/g
S96T005019	5AW-96-5	10A	95	1,810	1,730	1,770
S96T005020	5AW-96-7	10A	78	1,770	1,720	1,740
S96T005021	5AW-96-9	10A	77	1,640	1,700	1,670
S96T005075	5AW-96-15	15A	95	1,400	1,290	1,340
S96T005076	5AW-96-17	15A	73	2,080	2,330	2,200
S95T005077	5AW-96-20	15A	66	1,770	1,430	1,600$^{QC:e}$

Note:

[1]Triplicate measurement.

Table B2-114. 1996 Grab Sample Results for Tank 241-AW-105: Americium-241.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μCi/mL**	**μCi/mL**	**μCi/mL**
S96T005007	5AW-96-1	10A	155	<5.27E-06	<6.08E-06	<5.68E-06
S96T005008	5AW-96-2	10A	137	<7.94E-06	<6.75E-06	<7.35E-06
S96T005009	5AW-96-4	10A	118	<6.00E-06	<6.02E-06	<6.01E-06
S96T005013	5AW-96-10	15A	155	<6.57E-06	<5.58E-06	<6.08E-06
S96T005014	5AW-96-11	15A	137	<6.08E-06	<6.14E-06	<6.09E-06
S96T005015	5AW-96-14	15A	118	<6.59E-06	<6.68E-06	<6.64E-06
Interstitial Liquid			**in.**	**μCi/mL**	**μCi/mL**	**μCi/mL**
S96T005049	5AW-96-5	10A	95	<6.44E-05	7.75E-05	<7.10E-05
S96T005050	5AW-96-7	10A	78	2.63E-04	2.89E-04	2.76E-04
S96T005051	5AW-96-9	10A	77	<6.13E-05	<5.88E-05	<6.01E-05
S96T005081	5AW-96-15	15A	95	<3.33E-05	<3.66E-05	<3.50E-05
S96T005082	5AW-96-17	15A	73	<4.13E-05	<4.49E-05	<4.31E-05
S96T005083	5AW-96-20	15A	66	5.44E-04	6.09E-04	5.76E-04[QC:b]
Centrifuged Solids			**in.**	**μCi/g**	**μCi/g**	**μCi/g**
S96T005052	5AW-96-5	10A	95	0.324	0.287	0.305
S96T005053	5AW-96-7	10A	78	0.387	0.381	0.384
S96T005054	5AW-96-9	10A	77	0.371	0.355	0.363
S96T005084	5AW-96-15	15A	95	0.454	0.489	0.472
S96T005085	5AW-96-17	15A	73	1.07	0.672	0.871[QC:b,e]
S96T005086	5AW-96-20	15A	66	0.418	0.432	0.425

Table B2-115. 1996 Grab Sample Results for Tank 241-AW-105: Plutonium-239/240.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**μCi/mL**	**μCi/mL**	**μCi/mL**
S96T005007	5AW-96-1	10A	155	<3.73E-06	<3.75E-06	<3.74E-06
S96T005008	5AW-96-2	10A	137	<4.00E-06	<3.60E-06	<3.80E-06
S96T005009	5AW-96-4	10A	118	<4.08E-06	<3.74E-06	<3.91E-06
S96T005013	5AW-96-10	15A	155	<4.58E-06	<4.15E-06	<4.37E-06
S96T005014	5AW-96-11	15A	137	<4.26E-06	<4.44E-06	<4.35E-06
S96T005015	5AW-96-14	15A	118	<4.80E-06	<4.28E-06	<4.54E-06
Interstitial Liquid			**in.**	**μCi/mL**	**μCi/mL**	**μCi/mL**
S96T005049	5AW-96-5	10A	95	0.00118	0.00100	0.00109
S96T005050	5AW-96-7	10A	78	0.00182	0.00191	0.00186
S96T005051	5AW-96-9	10A	77	0.00585	0.00530	0.00558
S96T005081	5AW-96-15	15A	95	0.00477	0.00436	0.00456
S96T005082	5AW-96-17	15A	73	0.00286	0.00259	0.00272
S96T005083	5AW-96-20	15A	66	0.00178	0.00213	0.00196
Centrifuged Solids			**in.**	**μCi/g**	**μCi/g**	**μCi/g**
S96T005052	5AW-96-5	10A	95	0.458	0.447	0.453
S96T005053	5AW-96-7	10A	78	1.64	1.67	1.655
S96T005054	5AW-96-9	10A	77	1.77	1.73	1.75
S96T005084	5AW-96-15	15A	95	3.47	3.77	3.62
S96T005085	5AW-96-17	15A	73	3.76	3.03	3.395[QC:e]
S96T005086	5AW-96-20	15A	66	3.28	3.24	3.26

Table B2-116. 1996 Grab Sample Results for Tank 241-AW-105: Strontium-89/90.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μCi/mL	μCi/mL	μCi/mL
S96T005007	5AW-96-1	10A	155	0.0211	0.0201	0.0206
S96T005008	5AW-96-2	10A	137	0.0302	0.0312	0.0307
S96T005009	5AW-96-4	10A	118	0.0161	0.0159	0.0160
S96T005013	5AW-96-10	15A	155	0.0211	0.0193	0.0202
S96T005014	5AW-96-11	15A	137	0.0241	0.0262	0.0251
S96T005015	5AW-96-14	15A	118	7.33E-04	4.38E-04	5.86E-04[QC:e]
Interstitial Liquid			in.	μCi/mL	μCi/mL	μCi/mL
S96T005049	5AW-96-5	10A	95	0.294	0.0960	0.195[QC:e]
S96T005050	5AW-96-7	10A	78	0.00172	0.00232	0.00202[QC:e]
S96T005051	5AW-96-9	10A	77	0.684	0.623	0.653
S96T005081	5AW-96-15	15A	95	6.91E-04	5.30E-04	6.10E-04[QC:e]
S96T005082	5AW-96-17	15A	73	0.147	0.124	0.136
S96T005083	5AW-96-20	15A	66	8.28E-04	0.00177	0.00130[QC:e]
Centrifuged Solids			in.	μCi/g	μCi/g	μCi/g
S96T005052	5AW-96-5	10A	95	19.6	19.3	19.45
S96T005053	5AW-96-7	10A	78	65.2	65	65.1
S96T005054	5AW-96-9	10A	77	50.7	50	50.35
S96T005084	5AW-96-15	15A	95	30.5	32.2	31.35
S96T005085	5AW-96-17	15A	73	16.1	18.6	17.35
S96T005086	5AW-96-20	15A	66	31.4	29.5	30.45

Table B2-117. 1996 Grab Sample Results for Tank 241-AW-105: Cesium-137.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	μCi/mL	μCi/mL	μCi/mL
S96T005007	5AW-96-1	10A	155	0.739	0.736	0.738
S96T005008	5AW-96-2	10A	137	0.755	0.744	0.750
S96T005009	5AW-96-4	10A	118	0.788	0.800	0.794
S96T005013	5AW-96-10	15A	155	0.719	0.714	0.716
S96T005014	5AW-96-11	15A	137	0.745	0.755	0.750
S96T005015	5AW-96-14	15A	118	4.71	4.81	4.76
Interstitial Liquid			in.	μCi/mL	μCi/mL	μCi/mL
S96T005049	5AW-96-5	10A	95	6.46	6.66	6.56
S96T005050	5AW-96-7	10A	78	26.7	26.2	26.45
S96T005051	5AW-96-9	10A	77	25	25	25
S96T005081	5AW-96-15	15A	95	16.4	15.4	15.9
S96T005082	5AW-96-17	15A	73	24.8	25.4	25.1
S96T005083	5AW-96-20	15A	66	22.5	21.9	22.2
Centrifuged Solids			in.	μCi/g	μCi/g	μCi/g
S96T005052	5AW-96-5	10A	95	6.328	6.58	6.454
S96T005053	5AW-96-7	10A	78	20.66	20.6	20.63
S96T005054	5AW-96-9	10A	77	18.86	19.2	19.03
S96T005084	5AW-96-15	15A	95	13.58	13.8	13.69
S96T005085	5AW-96-17	15A	73	20.39	20.2	20.3
S96T005086	5AW-96-20	15A	66	13.94	14.2	14.07

Table B2-118. 1996 Grab Sample Results for Tank 241-AW-105: Cobalt-60.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**µCi/mL**	**µCi/mL**	**µCi/mL**
S96T005007	5AW-96-1	10A	155	1.08E-04	1.07E-04	1.07E-04
S96T005008	5AW-96-2	10A	137	1.06E-04	9.63E-05	1.01E-04
S96T005009	5AW-96-4	10A	118	<6.31E-05	1.16E-04	<8.96E-05
S96T005013	5AW-96-10	15A	155	1.30E-04	1.04E-04	1.17E-04[QC:e]
S96T005014	5AW-96-11	15A	137	7.85E-05	1.14E-04	9.63E-05[QC:e]
S96T005015	5AW-96-14	15A	118	9.66E-04	0.00116	0.00106
Interstitial Liquid			**in.**	**µCi/mL**	**µCi/mL**	**µCi/mL**
S96T005049	5AW-96-5	10A	95	0.00207	0.00211	0.00209
S96T005050	5AW-96-7	10A	78	0.0257	0.0259	0.0258
S96T005051	5AW-96-9	10A	77	0.0245	0.0232	0.0238
S96T005081	5AW-96-15	15A	95	0.0121	0.0112	0.0117
S96T005082	5AW-96-17	15A	73	0.0213	0.0217	0.0215
S96T005083	5AW-96-20	15A	66	0.0201	0.0194	0.0198
Centrifuged Solids			**in.**	**µCi/g**	**µCi/g**	**µCi/g**
S96T005052	5AW-96-5	10A	95	<0.0355	<0.0381	<0.0368
S96T005053	5AW-96-7	10A	78	0.0960	0.0743	0.0851
S96T005054	5AW-96-9	10A	77	0.0746	0.0555	0.0651[QC:e]
S96T005084	5AW-96-15	15A	95	0.0363	0.0354	0.0358
S96T005085	5AW-96-17	15A	73	<0.106	<0.103	<0.105
S96T005086	5AW-96-20	15A	66	0.0315	0.0306	0.0311

Table B2-119. 1996 Grab Sample Results for Tank 241-AW-105: Total Alpha Activity.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	µCi/mL	µCi/mL	µCi/mL
S96T005007	5AW-96-1	10A	155	<6.59E-05	<4.09E-05	<5.34E-05[QC:c]
S96T005008	5AW-96-2	10A	137	<8.18E-05	<4.09E-05	<6.14E-05[QC:c]
S96T005009	5AW-96-4	10A	118	<5.79E-05	<6.59E-05	<6.19E-05[QC:c]
S96T005013	5AW-96-10	15A	155	<7.87E-05	<7.07E-05	<7.47E-05
S96T005014	5AW-96-11	15A	137	<5.34E-05	<6.00E-05	<5.67E-05
S96T005015	5AW-96-14	15A	118	<1.85E-04	<3.15E-04	<2.50E-04
Interstitial Liquid			in.	µCi/mL	µCi/mL	µCi/mL
S96T005049	5AW-96-5	10A	95	0.00397	0.00390	0.00394[QC:c]
S96T005050	5AW-96-7	10A	78	0.00303	0.00255	0.00279[QC:c]
S96T005051	5AW-96-9	10A	77	0.00105	0.00169	0.00137[QC:c]
S96T005081	5AW-96-15	15A	95	8.80E-04	0.00138	0.00113[QC:c,e]
S96T005082	5AW-96-17	15A	73	0.00178	9.80E-04	0.00138[QC:c,e]
S96T005083	5AW-96-20	15A	66	5.47E-04	6.14E-04	5.80E-04[QC:c]
Centrifuged Solids			in.	µCi/g	µCi/g	µCi/g
S96T005052	5AW-96-5	10A	95	0.620	0.568	0.594[QC:c]
S96T005053	5AW-96-7	10A	78	1.74	1.83	1.785[QC:c]
S96T005054	5AW-96-9	10A	77	2.39	2.36	2.375[QC:c]
S96T005084	5AW-96-15	15A	95	4.08	3.64	3.86
S96T005085	5AW-96-17	15A	73	1.72	1.68	1.70
S96T005086	5AW-96-20	15A	66	3.69	3.48	3.585

Table B2-120. 1996 Grab Sample Results for Tank 241-AW-105: Bulk Density.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result
Sludge			**in.**	**g/mL**
S96T004809	5AW-96-5	10A	95	1.06
S96T004811	5AW-96-7	10A	78	1.24
S96T004813	5AW-96-9	10A	77	1.22
S96T004819	5AW-96-15	15A	95	1.16
S96T004821	5AW-96-17	15A	73	1.22
S96T004824	5AW-96-20	15A	66	1.2
Interstitial Liquid			**in.**	**g/mL**
S96T005049	5AW-96-5	10A	95	1.04
S96T005050	5AW-96-7	10A	78	1.05
S96T005051	5AW-96-9	10A	77	1.03
S96T005081	5AW-96-15	15A	95	0.980
S96T005082	5AW-96-17	15A	73	1.04
S96T005083	5AW-96-20	15A	66	1.09
Centrifuged Solids			**in.**	**g/mL**
S96T005019	5AW-96-5	10A	95	1.15
S96T005020	5AW-96-7	10A	78	1.32
S96T005021	5AW-96-9	10A	77	1.29
S96T005075	5AW-96-15	15A	95	1.26
S96T005076	5AW-96-17	15A	73	1.31
S96T005077	5AW-96-20	15A	66	1.26

Table B2-121. 1996 Grab Sample Results for Tank 241-AW-105: pH.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**Unitless**	**Unitless**	**Unitless**
S96T005004	5AW-96-1	10A	155	13.38	13.39	13.39
S96T005005	5AW-96-2	10A	137	13.43	13.44	13.43
S96T005006	5AW-96-4	10A	118	13.47	13.48	13.48
S96T005010	5AW-96-10	15A	155	13.41	13.42	13.41
S96T005011	5AW-96-11	15A	137	13.46	13.46	13.46
S96T005012	5AW-96-14	15A	118	13.63	13.64	13.64
Interstitial Liquid			**in.**	**Unitless**	**Unitless**	**Unitless**
S96T005049	5AW-96-5	10A	95	13.24	13.26	13.25
S96T005050	5AW-96-7	10A	78	13.45	13.49	13.47
S96T005051	5AW-96-9	10A	77	13.48	13.55	13.52
S96T005081	5AW-96-15	15A	95	13.46	13.48	13.47
S96T005082	5AW-96-17	15A	73	13.42	13.43	13.43
S96T005083	5AW-96-20	15A	66	13.34	13.28	13.31
Centrifuged Solids			**in.**	**Unitless**	**Unitless**	**Unitless**
S96T005019	5AW-96-5	10A	95	11.66	11.7	11.68
S96T005020	5AW-96-7	10A	78	12.26	12.25	12.25
S96T005021	5AW-96-9	10A	77	12.44	12.47	12.46
S96T005075	5AW-96-15	15A	95	12.35	12.33	12.34
S96T005076	5AW-96-17	15A	73	12.35	12.27	12.31
S96T005077	5AW-96-20	15A	66	12.49	12.48	12.48

Table B2-122. 1996 Grab Sample Results for Tank 241-AW-105: Specific Gravity.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			in.	Unitless	Unitless	Unitless
S96T005004	5AW-96-1	10A	155	1.021	1.015	1.018
S96T005008	5AW-96-2	10A	137	1.019	1.02	1.019
S96T005006	5AW-96-4	10A	118	1.012	1.01	1.011
S96T005010	5AW-96-10	15A	155	1.016	1.027	1.022
S96T005011	5AW-96-11	15A	137	1.021	1.025	1.023
S96T005012	5AW-96-14	15A	118	1.038	1.04	1.039

Table B2-123. 1996 Grab Sample Results for Tank 241-AW-105: Volume Percent Solids.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Sludge			in.	Percent	Percent	Percent
S96T004809	5AW-96-5	10A	95	7.09	n/a	7.09
S96T004811	5AW-96-7	10A	78	67.8	n/a	67.8
S96T004813	5AW-96-9	10A	77	73.7	n/a	73.7
S96T004819	5AW-96-15	15A	95	73.3	n/a	73.3
S96T004821	5AW-96-17	15A	73	67.6	n/a	67.6
S96T004824	5AW-96-20	15A	66	79.1	n/a	79.1

Table B2-124. 1996 Grab Sample Results for Tank 241-AW-105: Weight Percent Water.

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Supernatant			**in.**	**Percent**	**Percent**	**Percent**
S96T005007	5AW-96-1	10A	155	95.04	95.72	95.38
S96T005008	5AW-96-2	10A	137	95.67	95.63	95.65
S96T005009	5AW-96-4	10A	118	94.61	94.53	94.57
S96T005013	5AW-96-10	15A	155	95.1	94.98	95.04
S96T005014	5AW-96-11	15A	137	94.79	94.92	94.86
S96T005015	5AW-96-14	15A	118	94.03	93.7	93.87
Interstitial Liquid			**in.**	**Percent**	**Percent**	**Percent**
S96T005049	5AW-96-5	10A	95	92.61	92.74	92.67
S96T005050	5AW-96-7	10A	78	88.66	88.43	88.55
S96T005051	5AW-96-9	10A	77	88.68	89.02	88.85
S96T005081	5AW-96-15	15A	95	90.54	90.78	90.66
S96T005082	5AW-96-17	15A	73	90.16	74.58	82.37
S96T005083	5AW-96-20	15A	66	89.29	90.05	89.67
Centrifuged Solids			**in.**	**Percent**	**Percent**	**Percent**
S96T005019	5AW-96-5	10A	95	80.79	79.42	80.11
S96T005020	5AW-96-7	10A	78	64.68	66.26	65.47
S96T005021	5AW-96-9	10A	77	66.46	66.61	66.53
S96T005075	5AW-96-15	15A	95	75.58	75.23	75.41
S96T005076	5AW-96-17	15A	73	65.12	66.79	65.96
S96T005077	5AW-96-20	15A	66	66.19	71.2	68.69

Table B2-125. 1996 Grab Sample Results for Tank 241-AW-105: Differential Scanning Calorimetry (Wet Weight).

Sample Number	Grab Sample	Riser Number	Sample Elevation	Result	Duplicate	Mean
Centrifuged Solids			in.	J/g	J/g	J/g
S96T005021	5AW-96-9	10A	77	14.10	0.00	7.050[QC:e]
S96T005075	5AW-96-15	15A	95	16.4	15.8	16.1
S96T005076	5AW-96-17	15A	73	31.6	49.5	40.55[QC:e]
S96T005077	5AW-96-20	15A	66	22.2	21.5	21.85

Table B2-126. 1996 Sample Results for Tank 241-AW-105: Supernatant. (2 sheets)

Analyte	Sample[1]					
	5AW-96-1	5AW-96-2	5AW-96-4	5AW-96-10	5AW-96-11	5AW-96-14
Elemental Analysis (μg/mL)						
Ag	1.007	1.095	1.1	1.055	1.155	1.525
Al	15.85	16.7	17.2	16.1	16.9	88.7
B	3.21	5.45	2.92	2.86	2.67	2.755
Be	(0.205)	(0.205)	(0.205)	(0.205)	(0.205)	(0.205)
Ca	(4.10)	6.205	(4.10)	(4.10)	4.18	(4.10)
Cd	(0.205)	(0.205)	(0.205)	(0.205)	(0.205)	(0.205)
Cr	0.607	0.623	0.651	0.629	0.648	4.02
Fe	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)
K	1,240	1,280	1,320	1,270	1,310	3,340
La	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)
Li	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)
Mg	(4.10)	(4.10)	(4.10)	(4.10)	(4.10)	(4.10)
Mn	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)
Mo	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)	(2.05)
Na	12,600	12,800	13,000	12,800	12,900	18,800
Ni	(0.820)	(0.820)	(0.820)	(0.820)	(0.820)	(0.820)
P	14.1	13.4	13.3	13.15	11.95	54.4
S	46.25	45.95	46.6	46.2	47.3	94.45
Sb	(2.46)	(2.46)	(2.46)	(2.46)	(2.46)	(2.46)
Si	45.95	51.4	47.55	39.85	39.05	47.75
U	(20.5)	(20.5)	(20.5)	(20.5)	(20.5)	(20.5)
Zn	1.285	1.575	1.33	2.64	2.81	4.8
Zr	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)	(0.410)

Table B2-126. 1996 Sample Results for Tank 241-AW-105: Supernatant. (2 sheets)

Analyte	Sample[1]					
	5AW-96-1	5AW-96-2	5AW-96-4	5AW-96-10	5AW-96-11	5AW-96-14
Anion and Other Chemical Analyses (μg/mL)						
Cl	225.8	218.3	246.6	211.8	249.8	307.4
$C_2H_3O_2$	(63.6)	(63.6)	(117)	(117)	(117)	(541)
F	142.9	170.2	154.3	129.9	156.2	1,110
NO_2	1,100	1,110	1,170	1,080	1,270	1,710
NO_3	24,000	24,100	24,500	24,700	28,800	29,100
OH (*N*)	3,320	3,230	3,780	2,880	3,260	5,160
PO_4	(72.1)	(72.1)	(133)	(133)	(133)	(618)
SO_4	166.3	182.1	227.5	204.1	213.8	(711)
TIC (μg C/mL)	187	185.5	188.5	434.5	382.5	460.5
TOC (μg C/mL)	4,620	103.8	4,840	1,520	1,430	1,690
Radiochemical Analyses (μCi/mL)						
^{241}Am	(5.68E-06)	(7.35E-06)	(6.01E-06)	(6.08E-06)	(6.09E-06)	(6.64E-06)
$^{239/240}$Pu	(3.74E-06)	(3.80E-06)	(3.91E-06)	(4.37E-06)	(4.35E-06)	(4.54E-06)
$^{89/90}$Sr	0.0206	0.0307	0.0160	0.0202	0.0251	5.86E-04
^{60}Co	1.07E-04	1.01E-04	(8.96E-05)	1.17E-04	9.63E-05	0.00106
^{137}Cs	0.738	0.750	0.794	0.716	0.750	4.76
Total alpha	(5.34E-05)	(6.14E-05)	(6.19E-05)	(7.47E-05)	(5.67E-05)	(2.50E-04)
Physical Properties						
Specific gravity	1.018	1.019	1.011	1.022	1.023	1.039
pH	13.39	13.43	13.48	13.41	13.46	13.64
Wt%water	95.38	95.65	94.57	95.04	94.86	93.87

Note:

[1]A value in parentheses indicates that the analyte was not detected. The values in parentheses are the instrument detection limits achievable for samples that contain low concentrations of all elements.

Table B2-127. 1996 Sample Results for Tank 241-AW-105: Interstitial Liquid. (2 sheets)

Analyte	Sample[1]					
	5AW-96-5	5AW-96-7	5AW-96-9	5AW-96-15	5AW-96-17	5AW-96-20
Elemental Analysis (μg/mL)						
Ag	1.44	2.775	2.615	1.99	2.665	2.65
Al	132	704.5	663.5	462.5	704.5	589.5
B	9.145	6.055	(5.05)	(5.05)	(5.05)	(5.05)
Be	(0.505)	1.37	1.205	(0.505)	1.035	1.002
Ca	56.75	(10.1)	(10.1)	(10.1)	(10.1)	(10.1)
Cd	(0.611)	(0.505)	(0.505)	(0.505)	(0.505)	(0.505)
Cr	7.63	28.35	30.45	15.15	32.95	35.5
Fe	(20.0)	(5.05)	(5.05)	(5.05)	(5.05)	(5.05)
K	4,150	11,000	10,300	7,360	10,400	9,330
La	(5.05)	(5.50)	(5.05)	(5.05)	(5.05)	(5.05)
Li	(1.01)	(1.01)	(1.01)	(1.01)	(1.01)	(1.01)
Mg	(10.1)	(10.1)	(10.1)	(10.1)	(10.1)	(10.1)
Mn	(1.26)	(1.01)	(1.01)	(1.01)	(1.05)	(1.01)
Mo	(5.05)	(5.05)	(5.05)	(5.05)	(5.05)	(5.05)
Na	21,200	37,100	37,200	27,700	37,000	36,800
Ni	(2.02)	2.575	(2.21)	(2.02)	3.19	(2.40)
P	105.2	445.2	416.5	248.5	392	390
S	150	588.5	541.5	349.5	531	458
Sb	(6.06)	(6.06)	(6.06)	(6.06)	(6.06)	(6.06)
Si	104	57.75	53.8	33.4	51.1	54.25
U	270.4	137	(50.5)	(54.5)	67.35	(50.5)
Zn	6.465	7.075	10.3	3.725	3.89	3.68
Zr	7.045	56	10.21	3.335	16.1	3.465

Table B2-127. 1996 Sample Results for Tank 241-AW-105: Interstitial Liquid. (2 sheets)

Analyte	Sample[1]					
	5AW-96-5	5AW-96-7	5AW-96-9	5AW-96-15	5AW-96-17	5AW-96-20
Anion and Other Chemical Analyses (μg/mL)						
Cl	252.3	313.4	409.4	395.6	323.6	296.8
$C_2H_3O_2$	(117)	315.6	(275)	213.9	354.4	279.6
F	1,500	9,610	12,600	4,230	10,500	9,850
NO_2	1,520	4,640	4,690	2,970	4,720	3,930
NO_3	33,700	26,900	27,900	29,200	27,000	30,300
OH	5,440	8,580	9,460	7,530	9,220	8,860
PO_4	(133)	306.6	594.2	225.4	391.6	398.6
SO_4	405.2	1,560	1,630	949.9	1,510	1,260
TIC (μg C/mL)	425.5	845.5	743	581	783.5	681
TOC (μg C/mL)	704	2,540	2,210	1,670	2,270	1,870
Radiochemical Analyses (μCi/mL)						
^{241}Am	(7.10E-05)	2.76E-04	(6.01E-05)	(3.50E-05	(4.31E-05)	5.76E-04
$^{239/240}$Pu	0.00109	0.00186	0.00558	0.00456	0.00272	0.00196
$^{89/90}$Sr	0.195	0.00202	0.653	6.10E-04	0.136	0.00130
^{60}Co	0.00209	0.0258	0.0238	0.0117	0.0215	0.0198
^{137}Cs	6.56	26.45	25	15.9	25.1	22.2
Total alpha	0.00394	0.00279	0.00137	0.00113	0.00138	5.80E-04
Physical Properties						
Density (g/mL)	1.04	1.05	1.03	0.980	1.04	1.09
pH	13.25	13.47	13.52	13.47	13.43	13.31
Wt% water	92.67	88.55	88.85	90.66	82.37	89.67

Note:

[1]A value in parentheses indicates that the analyte was not detected. The values in parentheses are the instrument detection limits achievable for samples that contain low concentrations of all elements.

Table B2-128. 1996 Sample Results for Tank 241-AW-105: Centrifuged Solids. (2 sheets)

Analyte	Sample[1]					
	5AW-96-5	5AW-96-7	5AW-96-9	5AW-96-15	5AW-96-17	5AW-96-20
Elemental Analysis (μg/g)						
Ag	(359)	395	381.5	(197)	308	(201)
Al	(1,800)	1,110	1,210	1,100	1,680	1,150
B	(1,800)	(970)	(1,020)	(984)	(999)	(1,010)
Be	(180)	(97.0)	(102)	(98.4)	(99.9)	(101)
Ca	9,300	(1,940)	(2,030)	(1,970)	(2,000)	(2,010)
Cd	(180)	(104)	(114)	255.5	105.5	242
Cr	(359)	(213)	(234)	(201)	732	208.5
Fe	3,740	2,260	1,340	2,350	4,580	1,680
La	(1,800)	1,570	1,460	1,100	2,280	1,040
Li	(359)	(194)	(203)	(197)	(200)	(201)
Mg	(3,590)	(1,940)	(2,030)	(1,970)	(2,000)	(2,010)
Mn	(359)	977.5	842.5	770.5	4,140	742.5
Mo	(1,800)	(970)	(1,020)	(984)	(999)	(1,010)
Na	78,400	95,000	91,100	62,400	79,400	69,600
P	(7,190)	(3,880)	(4,070)	(3,940)	(4,000)	(4,030)
S	(3,590)	(1,940)	(2,030)	(1,970)	(2,000)	(2,010)
Sb	(2,400)	(1,230)	(1,340)	(1,180)	(1,200)	(1,210)
Si	(1,820)	1,100	(1,020)	(984)	1,260	(1,010)
U	59,000	43,800	54,500	95,100	42,800	94,400
Zn	(634)	330.5	409.5	(197)	(200)	(201)
Zr	570.5	84,200	69,600	16,600	77,800	17,200
Anion and Other Chemical Analyses (μg/g)						
Cl	205.6	(171)	196.8	224.4	116.5	318.5
$C_2H_3O_2$	(193)	(1,030)	(431)	(235)	(511)	(524)
F	1,400	36,600	28,400	4,070	20,000	4,190
NO_2	1,280	3,600	2,990	2,250	3,440	2,560
NO_3	26,300	17,800	18,300	23,000	18,700	22,700
OH	(42.0)	(42.0)	(42.0)	(42.0)	(42.0)	(42.0)
PO_4	465.6	(1,170)	(473)	394.7	(584)	(599)
SO_4	424.5	1,630	1,220	865.6	1,680	1,240

Table B2-128. 1996 Sample Results for Tank 241-AW-105: Centrifuged Solids. (2 sheets)

Analyte	Sample[1]					
	5AW-96-5	5AW-96-7	5AW-96-9	5AW-96-15	5AW-96-17	5AW-96-20
Anion and Other Chemical Analyses (μg/g) (Cont'd)						
PCBs	(0.993)	(0.888)	(0.955)	(0.903)	(0.897)	(0.855)
TIC (μg C/g)	1,100	919.5	874	653	810	700.5
TOC (μg C/g)	1,770	1,740	1,670	1,340	2,200	1,600
Radiochemical Analyses (μCi/g)						
^{241}Am	0.305	0.384	0.363	0.472	0.871	0.425
$^{239/240}$Pu	0.453	1.655	1.75	3.62	3.395	3.26
$^{89/90}$Sr	19.45	65.1	50.35	31.35	17.35	30.45
^{60}Co	(0.0368)	0.0851	0.0651	0.0358	(0.105)	0.0311
^{137}Cs	6.454	20.63	19.03	13.69	20.30	14.07
Total alpha	0.594	1.785	2.375	3.86	1.70	3.585
Physical Properties						
Density (g/mL)	1.15	1.32	1.29	1.26	1.31	1.26
pH	11.68	12.25	12.46	12.34	12.31	12.48
Wt% water	80.11	65.47	66.53	75.41	65.96	68.69

Note:

[1]A value in parentheses indicates that the analyte was not detected. The values in parentheses are the instrument detection limits achievable for samples that contain low concentrations of all elements.

Table B2-129. 1996 Supernatant Results for Tank 241-AW-105. (2 sheets)

Analyte	Result
Metals	**(μg/mL)**
Aluminum	28.6
Antimony	<2.46
Beryllium	<0.205
Boron	3.31
Cadmium	<0.205
Calcium	6.23
Chromium	1.20
Iron	<2.05
Lanthanum	<2.05
Lithium	<0.410
Magnesium	<4.1
Manganese	<0.410
Molybdenum	<2.05
Nickel	<0.820
Phosphorus	20.1
Potassium	1,630
Silicon	45.3
Silver	1.16
Sodium	13,800
Sulfur	54.5
Uranium	<20.5
Zinc	2.41
Zirconium	<0.410

Table B2-129. 1996 Supernatant Results for Tank 241-AW-105. (2 sheets)

Analyte	Result
Ions	**(μg/mL)**
Chloride	243
Fluoride	311
Hydroxide	3,600
Nitrate	25,900
Nitrite	1,240
Oxalate	<541
Phosphate	<618
Sulfate	284
Radionuclides	**(μCi/mL)**
^{241}Am (AEA)	<7.94E-06
^{137}Cs	1.42
^{60}Co	<0.820
$^{239/240}$Pu	<4.80E-06
$^{89/90}$Sr	0.0189
Total alpha	<3.15E-04
Physical Properties and Other Analytes	
Percent water	94.9
Specific gravity	1.02
pH	13.5
TIC	306 μg C/mL
TOC	2,370 μg C/mL

Table B2-130. 1996 Sludge Results for Tank 241-AW-105. (2 sheets)

Analyte	Result
Metals	**(μg/g)**
Aluminum	1,040
Antimony	1,150
Beryllium	<83.2
Boron	<831
Cadmium	117
Calcium	3,490
Chromium	228
Iron	1,770
Lanthanum	1,060
Lithium	<165
Magnesium	<1,650
Manganese	954
Molybdenum	<831
Phosphorus	<3,380
Silicon	817
Silver	211
Sodium	64,300
Sulfur	<1,730
Uranium	46,500
Zinc	439
Zirconium	33,400

Table B2-130. 1996 Sludge Results for Tank 241-AW-105. (2 sheets)

Analyte	Result
Ions	**(µg/g)**
Chloride	236
Fluoride	13,700
Hydroxide	2,210
Nitrate	23,200
Nitrite	2,910
Oxalate	<842
Phosphate	<949
Sulfate	1,170
Radionuclides	**(µCi/g)**
^{241}Am (AEA)	0.338
^{137}Cs	16.5
^{60}Co	<1.24
$^{239/240}$Pu	1.78
$^{89/90}$Sr	26.2
Total alpha	1.76
Physical Properties and Other Analytes	
Percent water	75.5
Density	1.18 g/mL
TIC	753 µg C/g
TOC	1,690 µg C/g

HISTORICAL DATA TABLES

Results of Early 1986 Sludge Sampling Event

The supernatant from the early 1986 sampling event was analyzed by ICP and IC directly. The water-soluble centrifuged solids and water-soluble sludge were determined by washing with 1,000 grams of deionized water per gram of centrifuged solids or sludge, and the centrifuged solids and sludge were determined by dissolving the samples with 1,000 grams of 0.8*M* nitric acid per gram of solids or sludge. For the radionuclide analyses, the supernatant was analyzed following acidification, and the water-soluble solids and water-soluble sludge were analyzed after being mixed with 1,000 grams of deionized water per gram of solids or sludge following acidification. The centrifuged solids were first dissolved in 1,000 grams of 0.8*M* nitric acid per gram of solids, and the 0.21-g sludge sample was first treated with 20 g of deionized water and acidified.

Additional analyses were completed on the samples to determine settling rate, particle size distribution, shear strength, and rheological properties. Scanning electron microscopy was also performed on the samples.

Based on the $^{239/240}Pu$ result of 0.563 $\mu Ci/g$, the waste is classified as transuranic waste. Table B2-131 presents the results of this sampling event. For further details, see Scheele and McCarthy (1986). These data have not been validated and should be used with caution.

Table B2-131. Early 1986 Sludge Results for Tank 241-AW-105.[1] (3 sheets)

Analyte	Supernatant	Water Soluble Centrifuged Solids	Centrifuged Solids	Water Soluble Sludge	Sludge
Physical Data					
Supernatant density (g/mL)	1.079	NR	NR	NR	NR
Sludge density (g/mL)	NR	NR	NR	NR	1.20
Density (g/mL)	NR	NR	1.35	NR	NR
pH	13.2	9.7	NR	7.3	NR
Weight fraction (wt%)	43		57		
Volume fraction (vol%)	48		52		
Total solids (wt%)					28
Percent water (wt%)					72
Chemical Analysis					
Fluoride (µg/g)	11,000	28,000	39,000	85,000	75,000
Chloride (µg/g)	4,000	1,000	2,000	1,000	2,000
Nitrite (µg/g)	5,000	3,700	NR	4,500	NR
Nitrate (µg/g)	28,000	21,000	NR	25,000	NR
Phosphate (µg/g)	<2,000	<1,000	<26,000	<1,000	<25,000
Sulfate (µg/g)	11,000	9,000	<90,000	5,800	85,000[2]
TOC (µg C/g)	3,200	5,200	5,200	5,400	5,200
Carbonate (µg/g)	52,000	62,000	NR	63,000	NR
Hydroxide (µg/g)	12,000	NR	12,000	NR	11,000
Ammonia (µg/g)	1,800	NR	220	NR	390
Group I[3]					
Aluminum (µg/g)	410	430	1,200	95	960
Barium (µg/g)	n/d	50	110	15	70
Calcium (µg/g)	40	110	240	36	200
Chromium (µg/g)	30	25	200	20	170
Iron (µg/g)	n/d	30	450	10	320
Potassium (µg/g)	12,600	10,400	12,800	11,800	12,300
Lanthanum (µg/g)	n/d	n/d	530	n/d	340
Magnesium (µg/g)	90	40	10	30	10

Table B2-131. Early 1986 Sludge Results for Tank 241-AW-105.[1] (3 sheets)

Analyte	Supernatant	Water Soluble Centrifuged Solids	Centrifuged Solids	Water Soluble Sludge	Sludge
Group I[3] (Cont'd)					
Manganese (μg/g)	n/d	n/d	10	n/d	10
Molybdenum (μg/g)	220	25	n/d	20	15
Sodium (μg/g)	38,400	56,700	82,000	1.10E+05	1.12E+05
Neodymium (μg/g)	n/d	n/d	180	n/d	80[2]
Nickel (μg/g)	n/d	30	80	30	60
Ruthenium (μg/g)	n/d	n/d	<30	n/d	100[2]
Silicon (μg/g)	n/d	600	1,500	280	1,100
Zirconium (μg/g)	n/d	6,200	1.16E+05	2,200	79,000
Group II[4]					
Silver (μg/g)	<240	<100	310[2]	≤100	200[2]
Arsenic (μg/g)	<2,400	<960	<1,000	<980	<1,000
Cadmium (μg/g)	<120	<50	<50	<50	<50
Copper (μg/g)	<120	<50	<50	<50	<50
Mercury (μg/g)	<12,000	<4,800	<5,200	<4,900	<5,100
Lead (μg/g)	<1,200	<480	4,600	<490	3,100
Antimony (μg/g)	<1,200	<480	<500	<490	<500
Selenium (μg/g)	<4,700	<1,900	<2,100	<2,000	<2,000
Tin (μg/g)	<1,200	<480	940[2]	<490	1,200[2]
Radionuclide Analysis					
^{144}Ce (μCi/g)	0.421	3.63	48.7	n/d	32.8
^{137}Cs (μCi/g)	45.9	46.2	42.3	33	36.9
^{134}Cs (μCi/g)	1.88	1.85	1.7	1.12	1.49
^{103}Ru (μCi/g)	n/d	n/d	<1.4	n/d	<0.8
^{106}Ru (μCi/g)	7.83	10.9	50.6	6.06	35.3
^{125}Sb/Te (μCi/g)	<0.5	1.97	17.7	1.62	11.1

Table B2-131. Early 1986 Sludge Results for Tank 241-AW-105.[1] (3 sheets)

Analyte	Supernatant	Water Soluble Centrifuged Solids	Centrifuged Solids	Water Soluble Sludge	Sludge
Radionuclide Analysis (Cont'd)					
^{95}Nb (μCi/g)	n/d	9.95	224	0.845	122
^{95}Zr (μCi/g)	n/d	5.12	108	0.47	57.1
$^{239/240}$Pu (μCi/g)	1.07E-04	0.0666	0.786	0.0172	0.563
^{239}Pu[5] (μCi/g)	7.79E-05	0.0482	0.572	0.0125	0.41
^{240}Pu[5] (μCi/g)	2.91E-05	0.018	0.214	0.00469	0.153
^{241}Pu[5] (μCi/g)	0.00224	1.39	16.5	0.361	11.8
Total uranium (μg/g)	6.92	1,540	7,040	0.0254	6,580
^{241}Am (μCi/g)	9E-06	0.0208	0.169	0.0115	0.112
^{90}Sr (μCi/g)	0.00337	2.92	15.2	0.363	10.8
^{99}Tc (μCi/g)	0.0115	0.0104	0.0166	0.00955	0.0137
^{14}C (μCi/g)	9.18E-05	0.0805	0.0152	<0.00477	0.00236
^{129}I (μCi/g)	2.8E-05	<2E-05	1.89E-05	NR	3.56E-05
Total alpha activity (μCi/g)	2.32E-04	0.0943	1.02	0.0387	0.739
Total beta activity (μCi/g)	61.5	8.48	349	43.0	230

Notes:

n/d = not detected
NR = not requested

[1]Scheele and McCarthy (1986). Pre-1989 analytical data have not been validated and should be used with caution.

[2]At or near detection limit.

[3]Group I elements measured using direct reader spectrometer of the ICP.

[4]Group II elements measured using scanning reader spectrometer of the ICP.

[5]Calculated using ^{239}Pu + ^{240}Pu analysis and isotopic mass ratios ^{240}Pu: ^{239}Pu and ^{241}Pu: ^{239}Pu.

Results of July 1986 Sludge Sampling Event

A blended, representative sample of each solids-bearing segment was submitted for analysis. Replicate samples were also submitted for segments 6, 8, and 10. A composite sample was prepared by mixing equal portions of segments six through ten (Peters 1986). The "white" samples dissolved in about 3*M* nitric acid with only a trace of turbidity. The two dark-colored samples initially did not completely dissolve. After the samples were stirred and diluted by a factor of 250 in 2*M* nitric acid, no undissolved residue was observed. All samples were stirred before sample aliquots were taken (Leaf 1986). All results are reported per gram of settled solids.

To verify the accuracy of the transuranic analysis method, two samples of synthetic NCRW, spiked with known amounts of plutonium and americium, were also submitted for analysis. The results of this spike analysis indicate that a high degree of confidence can be placed on the plutonium and americium results (Peters 1986).

Tank 241-AW-105 was found to contain transuranic elements in excess of the targeted 0.1 μCi/g of solids. Rare earth elements such as lanthanum were also found in greater concentrations than expected. Table B2-132 gives the results of the July 2, 1986, sampling and analysis event. For further information, see Peters (1986), Peters and Patterson (1986), and Leaf (1986). These data have not been validated and should be used with caution.

Results of September 1986 Sludge Sampling Event

Table B2-133 gives the analytical results of the September 1986 sampling event. All results are based on the sample weight before settling or centrifuging (Leaf and McCown 1987). No further information regarding sample analysis was provided.

The results from this core were compared to the results of the core removed from riser 13A on July 2, 1986, and no significant differences between the two sets of data were found (Sasaki 1987). These data have not been validated and should be used with caution.

Table B2-132. July 2, 1986, Sludge Results for Tank 241-AW-105.[1,2,3,4] (2 Sheets)

Analyte	Seg. 5	Seg. 6	Seg. 6	Seg. 7	Seg. 8	Seg. 8	Seg. 9	Seg. 10	Seg. 10	Composite	Lab Units
Physical Data											
Density	1.22	NA	1.34	1.28	1.36	1.35	1.41	1.44	1.39	1.39	g/mL
[2]Density settled solids	1.22	1.74	1.34	1.28	1.36	1.35	1.41	1.44	1.39	1.39	g/mL
[2]Density centrifuged solids	1.22	1.73	1.34	1.30	1.37	1.35	1.38	1.43	1.38	1.34	g/mL
[2]Centrifuged solids	90	97	94	84	93	91	95	100	100	97	vol%
[3]Percent water	NR	NR	NR	NR	63		NR	NR	NR	NR	wt%
Chemical Analysis											
Lanthanum	0.04	0.07	0.07	0.06	0.04	0.04	<0.01	<0.01	<0.01	0.03	wt%
Zirconium	5.09	7.44	7.70	6.53	7.27	7.48	8.20	2.91	3.11	6.89	wt%
Tin	0.04	0.07	0.07	0.05	0.06	0.07	0.08	0.08	0.07	0.07	wt%
Aluminum	<0.05	0.1	<0.08	<0.09	0.11	0.12	0.16	0.67	0.65	0.26	wt%
Sodium	6.57	9.91	9.69	9.02	12.2	12.6	12.5	10.7	10.7	11.1	wt%
Manganese	n/d	n/d	n/d	n/d	n/d	n/d	n/d	0.56	0.57	0.12	wt%
Chromium	n/d	0.01	<0.01	<0.01	<0.01	<0.01	n/d	0.35	0.33	0.1	wt%
Uranium	0.18	0.47	0.48	0.45	0.48	0.47	1.38	6.02	5.95	1.07	wt%
Iron	0.02	0.09	0.04	0.03	0.06	0.05	0.04	1.05	0.97	0.24	wt%
Potassium	1.3	1.2	1.2	1.0	0.8	0.8	<0.5	<0.2	<0.2	<0.7	wt%

Table B2-132. July 2, 1986, Sludge Results for Tank 241-AW-105.[1,2,3,4] (2 Sheets)

Analyte	Seg. 5	Seg. 6	Seg. 6	Seg. 7	Seg. 8	Seg. 8	Seg. 9	Seg. 10	Seg. 10	Composite	Lab Units
Radiological Analysis											
$^{239/240}Pu$	0.266	0.524	0.520	1.137	0.382	0.368	0.666	0.527	0.546	0.636	μCi/g
^{241}Am	0.019	0.037	0.029	0.504	0.018	0.019	0.042	2.178	1.170	0.400	μCi/g

Notes:

NA = not analyzed
Seg. = segment

[1]Peters (1986)
[2]Leaf (1986)
[3]Peters and Patterson (1986)
[4]Pre-1989 data have not been validated and should be used with caution.

Table B2-133. September 1986 Sludge Results for Tank 241-AW-105.[1,2,3] (3 sheets)

Analyte	Seg. 2A	Seg. 3A	Seg. 4A	Seg. 5A	Seg. 6A	Seg. 6B	Lab Units
Physical Data							
Settled solids	96	100	88	99	100	100	vol%
Density	1.17	1.18	1.43	1.34	1.41	1.36	g/mL
Centrifuged solids	64	78	78	86	77	94	vol%
Density	1.3	1.29	1.37	1.38	1.57	1.37	g/mL
Percent water	73	70	65	57	53	53	wt%
Chemical Analysis							
Uranium	7.6	5.07	6.72	8.04	9.02	40.8	g/L
TOC	1.12	3.693	6.249	7.236	13.409	21.216	g C/L
Carbonate	0.071	0.069	0.084	0.163	0.371	0.519	*M*
Aluminum	0.0269	0.035	0.0567	0.109	0.25	0.498	*M*
Boron	0.0281	0.0251	0.086	0.0645	0.0326	0.0151	*M*
Barium	7.67E-04	8.59E-04	0.00156	0.00127	0.00113	6.93E-04	*M*
Calcium	0.00204	0.00324	0.00678	0.00501	0.0204	0.168	*M*
Cerium	n/d	n/d	n/d	n/d	n/d	0.00272	*M*
Chromium	0.00202	0.00227	0.00330	0.00387	0.00922	0.192	*M*
Iron	0.00398	0.00444	0.00666	0.0101	0.00631	0.438	*M*
Potassium	0.389	0.332	0.311	0.223	0.101	0.0661	*M*
Lanthanum	0.00438	0.0045	0.00576	9.65E-05	1.42E-04	6.85E-04	*M*
Magnesium	9.63E-04	0.00194	0.00471	0.00276	0.00174	0.0772	*M*
Manganese	n/d	8.59E-05	1.04E-04	2.44E-04	0.00693	0.272	*M*
Molybdenum	n/d	n/d	n/d	n/d	n/d	4.25E-04	*M*

Table B2-133. September 1986 Sludge Results for Tank 241-AW-105.[1,2,3] (3 sheets)

Analyte	Seg. 2A	Seg. 3A	Seg. 4A	Seg. 5A	Seg. 6A	Seg. 6B	Lab Units
Chemical Analysis (Cont'd)							
Sodium	3.87	4.36	6.72	7.58	8.22	5.38	*M*
Neodymium	0.00146	0.00155	0.00178	1.86E-04	4.89E-04	0.00236	*M*
Nickel	5.98E-04	8.04E-04	0.00122	0.00274	0.00504	0.0229	*M*
Rhodium	n/d	n/d	n/d	n/d	n/d	0.0041	*M*
Ruthenium	n/d	n/d	n/d	n/d	0.00151	0.00387	*M*
Silicon	0.0916	0.0924	0.351	0.248	0.113	0.0692	*M*
Strontium	4.01E-05	6.73E-05	1.14E-04	9.18E-05	1.29E-04	7.76E-04	*M*
Tellurium	n/d	n/d	n/d	n/d	4.42E-04	0.00107	*M*
Titanium	7.33E-04	7.39E-04	8.96E-04	0.00112	0.00118	0.00142	*M*
Zinc	n/d	n/d	n/d	n/d	4.31E-04	0.0025	*M*
Zirconium	0.782	0.879	1.08	1.28	1.24	0.24	*M*
Ammonia	0.127	0.089	0.134	0.08	0.049	0.007	*M*
Hydroxide	0.757	0.694	0.504	0.63	0.663	0.384	*M*
Fluoride	2.525	3.105	5.043	5.289	4.482	0.587	*M*
Chloride	0.01	0.01	0.01	0.02	0.028	0.031	*M*
Nitrite	0.074	0.085	0.131	0.271	0.509	0.591	*M*
Nitrate	0.283	0.324	0.369	0.713	1.233	1.294	*M*
Sulfate	0.01	0.012	0.015	0.012	0.022	0.028	*M*
$^{239/240}Pu$	412	1,003	381	610	481	883	nCi/g
^{241}Am	28	425	83	42	250	1,820	nCi/g
^{95}Nb	20,400	60,100	27,000	911	n/d	n/d	μCi/L

Table B2-133. September 1986 Sludge Results for Tank 241-AW-105.[1,2,3] (3 sheets)

Analyte	Seg. 2A	Seg. 3A	Seg. 4A	Seg. 5A	Seg. 6A	Seg. 6B	Lab Units
Radiological Analysis							
^{95}Zr	9,280	29,000	12,400	487	n/d	n/d	μCi/L
^{106}Ru	25,900	26,800	35,300	23,800	21,000	9,010	μCi/L
^{125}Sb	9,750	8,450	12,700	13,900	14,000	3,330	μCi/L
^{134}Cs	1,700	1,370	1,190	779	412	n/d	μCi/L
^{137}Cs	39,000	31,000	34,900	67,000	1.12E+05	1.54E+05	μCi/L
^{144}Ce	32,000	31,000	35,700	23,800	16,500	85,800	μCi/L
^{60}Co	205	292	225	447	457	67.4	μCi/L
^{154}Eu	n/d	n/d	n/d	n/d	1,230	4,730	μCi/L
^{155}Eu	n/d	n/d	n/d	n/d	1,300	5,950	μCi/L
^{238}Pu	21	145	77	33	60	90	nCi/g
^{239}Pu	322	653	283	480	378	681	nCi/g
^{240}Pu	90	350	98	130	102	202	nCi/g
^{241}Pu	5,058	26,182	6,263	7,159	5,557	7,336	nCi/g
^{242}Pu	0.009	0.128	0.023	0.01	0.009	0.03	nCi/g

Notes:

[1]Brevick et al. (1997)

[2]Leaf and McCown (1987).

[3]Pre-1989 data have not been validated and should be used with caution.

Results of May 1990 Sludge Sampling Event

Segments 1 through 3 were received by the Pacific Northwest Laboratory 325 Laboratory on May 17, 1990, segments 4 through 6 were received on May 23, 1990, and segment 7 was received on June 6, 1990. Analyses of the waste were performed during the latter half of 1990.

Segments 1 and 2 contained 205 mL and 245 mL of opaque liquid, respectively, with no observable solids. Segments 3 through 7 contained no free liquids. Segment 3 appeared as a gray slurry on the top 28 cm (11 in.). With increasing depth, the color lightened from gray to white at 28 cm near the bottom and could not hold its shape. Segment 4 was a white sludge, similar to the material at the bottom of segment 3. The material in segment 5 was dry and broke off into chunks upon extrusion. The material was white with the exception of some brown and black spots. The first 18 cm (7 in.) of segment 6 appeared similar to segment 5, but with streaks of brown. The bottom 30 cm (12 in.) was grayish white and had a margarine-like consistency. Segment 7 was very dark with white marbling in the top 10 cm (4 in.). The material in segment 7 was harder than that in the previous segments (Tingey and Simpson 1994).

Select segments, composites, and dilutions were prepared for analysis of chemical and radiochemical components. The segment 6 and the segment 3 to 6 composites were centrifuged, and the centrifuged solids and decanted liquid were analyzed separately. The segment 5 and 7 and segment 3 and 4 composite solids were not centrifuged before analysis. Before analysis, two fusions of each of the solids were performed, and liquids were filtered through a 0.2-μm filter. The first fusion was a sodium peroxide fusion in a zirconium crucible, and the second was a potassium hydroxide fusion in a nickel crucible. The fusions were dissolved in hydrochloric acid. Chemical and radiochemical analyses were then performed on these solutions. To determine transuranic content, the analysis of solids was run on a sodium peroxide fusion of the samples. A water leach of each solid and a dilution of each liquid was used before measurement of the anions by IC. Rheological measurements were performed on segment 5 (Tingey and Simpson 1994). The sludge results of the 1990 core sampling event are given in Tables B2-134 through B2-137.

Table B2-134. 1990 Core Sample Results for Tank 241-AW-105: Solids.[1] (4 sheets)

Analyte	Segment[2, 3]				
	3-4 Composite	5	6	7	3-6 Composite
Elemental Analysis (wt%)					
Ag	(0.0017)	0.0218	0.0314	0.0119	0.0144
Al	0.324	0.252	0.332	3.66	0.352
As	0.0476	0.0817	0.0616	0.0509	0.0509
B	(0.12)	0.0467	0.0467	0.0467	0.0467
Ba	0.0209	0.0184	0.0168	0.0086	0.0194
Be	0.016	0.0138	0.0139	0.00155	0.0172
Ca	0.0944	0.0694	0.0696	0.0977	0.134
Cd	(0.0024)	0.0116	0.0116	0.0116	0.0116
Ce	(0.063)	(0.13)	(0.13)	(0.13)	(0.13)
Co	0.0903	0.29	0.29	0.29	0.29
Cr	0.0676	0.0522	0.0477	1.75	0.0868
Cr(VI)	NA	NA	NA	0.283	0.0170
Cu	0.0273	0.0130	0.0175	0.0294	0.0285
Dy	0.00355	0.0075	0.0075	0.0075	0.0075
Fe	0.359	0.172	0.158	1.94	0.568
K	2.02	2.37	1.029	0.471	3.65
La	0.180	0.200	0.0213	0.0165	0.255
Li	(0.014)	(0.0032)	(0.0032)	(0.0032)	(0.0032)
Mg	0.0091	0.0041	0.0081	0.058	0.0131
Mn	0.0954	0.0106	0.0152	0.55	0.211
Mo	0.003	0.0051	0.0051	0.0079	0.0051
Na	27.0	27.0	28.7	25.5	25.8
Nd	0.0949	0.0627	0.0351	0.042	0.0658
Ni	0.0377	0.0178	0.0288	0.0556	0.0261
P	0.432	0.586	0.123	0.250	0.285
Pb	0.0337	0.0700	0.0598	0.136	0.0598
Re	0.0089	0.0105	0.0105	0.0105	0.0105
Rh	0.0449	0.109	0.0801	0.0587	0.0587
Ru	(0.034)	0.0397	0.0397	0.0397	0.0397

Table B2-134. 1990 Core Sample Results for Tank 241-AW-105: Solids.[1] (4 sheets)

Analyte	Segment[2,3]				
	3-4 Composite	5	6	7	3-6 Composite
Elemental Analysis (wt%) (Cont'd)					
Sb	(0.080)	0.0611	0.0611	0.0611	0.0611
Se	(0.096)	0.124	0.124	0.124	0.124
Si	0.888	0.827	0.492	0.306	0.659
Sr	0.0024	0.0019	0.00205	0.0023	0.00255
Te	0.0433	0.0566	0.0566	0.0566	0.0566
Th	0.0936	0.129	0.129	0.129	0.129
Ti	0.0047	0.0196	0.0162	0.0068	0.0141
Tl	(0.98)	(1.4)	(1.4)	(1.4)	(1.4)
U	0.310	2.44	3.06	1.25	1.90
V	0.00725	0.0081	0.0081	0.0081	0.0081
Zn	0.0747	0.0251	0.0138	0.032	0.0171
Zr	23.8	21.0	21.6	2.36	23.2
Anion and Other Chemical Analyses ($\mu g/g$)					
F ($\mu g/mL$)	86,800	170,000	150,000	22,000	71,800
Cl	1,820	2,800	2,500	1,900	1,500
Br	(300)	(200)	(200)	(200)	(5)
NO_2	12,100	18,000	19,000	30,000	7,700
NO_3	41,500	46,000	42,000	81,000	21,500
PO_4	1,120	2,900	(500)	1,300	(1,000)
SO_4	2,600	3,100	1,800	5,600	1,000
CO_3 (wt% C)	1.6	0.24	0.42	0.57	0.19
TOC (wt% C)	0.3	0.41	0.35	2.93	0.29
TC (wt% C)	1.9	0.65	0.77	3.68	0.48

Table B2-134. 1990 Core Sample Results for Tank 241-AW-105: Solids.[1] (4 sheets)

Analyte	Segment[2, 3]				
	3-4 Composite	5	6	7	3-6 Composite
Radiochemical Analyses (nCi/g)					
^{3}H	NA	NA	NA	16.8	5.41
^{14}C	NA	NA	NA	2.7	0.300
^{79}Se	NA	NA	NA	(32.4)	(2.66)
^{90}Sr	NA	NA	NA	3.00E+05	81,500
^{94}Nb	NA	NA	NA	(2.26)	27.2
^{99}Tc	NA	NA	NA	(90.1)	53.6
^{129}I	NA	NA	NA	(3.47)	1.52
^{237}Np	NA	NA	NA	3.45	2.47
^{241}Am	1,500	1,950	745	5,430	1,040
$^{243/244}Cm$	16.2	n/d	n/d	376	30.9
^{238}Pu & ^{241}Am	1,020	2,000	437	n/r	n/r
$^{239/240}Pu$	3,040	2,980	1,780	237	2,870
^{238}Pu	n/r	n/r	n/r	(608)	291
^{60}Co	560	532	496	597	430
^{106}Ru	19,100	8,220	5,240	n/d	5,990
^{125}Sb	13,900	12,500	14,800	n/d	10,800
^{134}Cs	1,710	994	613	n/d	548
^{137}Cs	1.04E+05	82,900	83,200	1.76E+05	69,200
^{144}Ce	29,900	4,140	3,610	n/d	6,580
^{154}Eu	n/d	939	n/d	8,900	410
^{155}Eu	1,550	433	821	11,100	649

Table B2-134. 1990 Core Sample Results for Tank 241-AW-105: Solids.[1] (4 sheets)

Analyte	Segment[2, 3]				
	3-4 Composite	5	6	7	3-6 Composite
Radiochemical Analyses (nCi/g) (Cont'd)					
Total alpha	4,140	4,950	2,220	n/r	n/r
Total beta	NA	NA	NA	8.20E+05	2.54E+05

Notes:

n/r = not reported

[1]Tingey and Simpson (1994)

[2]Segment 6 and segment 3 to 6 composite are centrifuged solids analyses. Segments 5 and 7 and segment 3 and 4 composite were not centrifuged.

[3]A value in parentheses indicates that the analyte was not detected. The values in parentheses are the instrument detection limits achievable for samples that contain low concentrations of all elements.

Table B2-135. 1990 Core Sample Results for Tank 241-AW-105: Liquids.[1] (3 sheets)

Analyte	Segment[2]					
	1-2 Composite	3-4 Composite	5	6	7	3-6 Composite
Elemental Analysis (μg/mL)						
Ag	(0.169)	NA	NA	(0.169)	NA	(0.169)
Al	906	NA	NA	1,130	NA	684
As	6.76	NA	NA	9.12	NA	11.1
B	3.27	NA	NA	19.9	NA	5.96
Ba	0.25	NA	NA	4.54	NA	2.13
Be	0.785	NA	NA	2.65	NA	2.7
Ca	7.86	NA	NA	8.03	NA	19.4
Cd	0.1	NA	NA	0.29	NA	0.12
Ce	(1.2)	NA	NA	(1.2)	NA	(1.2)
Co	(2.2)	NA	NA	(2.2)	NA	(2.2)
Cr	32.5	NA	NA	23.9	NA	133
Cr(VI)	22.2	NA	NA	NA	NA	(4.5)
Cu	0.45	NA	NA	23.7	NA	15.2
Dy	(0.051)	NA	NA	(0.051)	NA	(0.051)
Fe	0.665	NA	NA	1.27	NA	1.27
K	13,700	NA	NA	8,910	NA	14,900
La	(0.13)	NA	NA	(0.13)	NA	(0.13)
Li	(0.086)	NA	NA	(0.086)	NA	(0.086)
Mg	0.355	NA	NA	0.34	NA	0.525
Mn	0.04	NA	NA	0.09	NA	0.07
Mo	2.78	NA	NA	11.9	NA	7.45
Na	34,200	NA	NA	58,600	NA	50,500
Nd	(0.28)	NA	NA	(0.28)	NA	(0.28)
Ni	0.99	NA	NA	200	NA	70.9
P	317	NA	NA	959	NA	1,180
Pb	1.76	NA	NA	1.1	NA	1.1
Re	(0.11)	NA	NA	0.3	NA	0.3
Rh	0.4	NA	NA	1.68	NA	(0.28)

Table B2-135. 1990 Core Sample Results for Tank 241-AW-105: Liquids.[1] (3 sheets)

Analyte	Segment[2]					
	1-2 Composite	3-4 Composite	5	6	7	3-6 Composite
Elemental Analysis (μg/mL) (Cont'd)						
Ru	0.5	NA	NA	3.84	NA	1.5
Sb	(0.51)	NA	NA	1.2	NA	0.5
Se	(1.23)	NA	NA	1.4	NA	(1.24)
Si	213	NA	NA	2,030	NA	5,340
Sr	0.02	NA	NA	0.105	NA	0.04
Te	(0.41)	NA	NA	(0.41)	NA	(0.41)
Th	(0.78)	NA	NA	(0.78)	NA	(0.79)
Ti	(0.091)	NA	NA	(0.091)	NA	(0.092)
Tl	(12)	NA	NA	(12)	NA	(12)
U	16.7	NA	NA	11	NA	(5.8)
V	0.1	NA	NA	(0.069)	NA	(0.070)
Zn	4.75	NA	NA	2.78	NA	1.73
Zr	0.45	NA	NA	5.27	NA	0.74
Anion and other chemical analyses (μg/mL)						
NH_3 (m*M*)	59.99	0.79	48.26	44.01	8.94	5.57
F	8,300	NA	NA	8,000	NA	7,700
Cl	440	NA	NA	1,300	NA	880
Br	(40)	NA	NA	(200)	NA	(500)
NO_2	4,900	NA	NA	19,500	NA	11,000
NO_3	24,000	NA	NA	49,000	NA	37,000
PO_4	660	NA	NA	(400)	NA	900
SO_4	1,760	NA	NA	1,800	NA	2,100
OH (*N*)	0.76	NA	NA	NA	NA	0.768
CO_3 (wt% C)	0.12	NA	NA	0.1	NA	0.26
TOC (wt% C)	0.06	NA	NA	0.002	NA	0.485
TC (wt% C)	0.18	NA	NA	0.1	NA	0.745
pH (unitless)	13.18	NA	NA	NA	12.8	13.43

Table B2-135. 1990 Core Sample Results for Tank 241-AW-105: Liquids.[1] (3 sheets)

Analyte	Segment[2]					
	1-2 Composite	3-4 Composite	5	6	7	3-6 Composite
Radiochemical Analyses (nCi/mL)						
^{3}H	6.58	NA	NA	NA	NA	5.9
^{14}C	0.124	NA	NA	NA	NA	0.910
^{79}Se	0.0215	NA	NA	NA	NA	(0.0338)
^{90}Sr	0.382	NA	NA	NA	NA	(11.7)
^{94}Nb	(0.00482)	NA	NA	NA	NA	(0.00376)
^{99}Tc	6.85	NA	NA	NA	NA	31.2
^{129}I	0.0269	NA	NA	NA	NA	0.0241
^{237}Np	(0.00189)	NA	NA	NA	NA	0.0155
^{241}Am	0.0991	NA	NA	n/d	NA	0.00419
$^{243/244}$Cm	0.0286	NA	NA	0.287	NA	0.000653
^{238}Pu & ^{241}Am	NR	NA	NA	0.730	NA	NR
$^{239/240}$Pu	(0.0450)	NA	NA	0.402	NA	0.00946
^{238}Pu	(0.0450)	NA	NA	NR	NA	0.00236
^{60}Co	21.0	NA	NA	131	NA	102
^{106}Ru	935	NA	NA	1,730	NA	923
^{125}Sb	n/d	NA	NA	n/d	NA	n/d
^{134}Cs	583	NA	NA	374	NA	493
^{137}Cs	46,800	NA	NA	85,100	NA	67,100
^{144}Ce	n/d	NA	NA	n/d	NA	n/d
^{154}Eu	n/d	NA	NA	n/d	NA	n/d
^{155}Eu	n/d	NA	NA	n/d	NA	n/d
Total alpha	n/r	NA	NA	1.44	NA	n/r
Total beta	49,500	NA	NA	NA	NA	70,700

Notes:

[1]Tingey and Simpson (1994)

[2]A value in parentheses indicates that the analyte was not detected. The values in parentheses are the instrument detection limits achievable for samples that contain low concentrations of all elements.

Table B2-136. Tank 241-AW-105 1990 Core Sample: Physical Properties.

Analyte	Segment							
	1-2	3-4	5	5 1:1	5 1:2	6	7	3-6
Sample density (g/mL)	1.08	1.35	1.40	1.22	1.16	1.44	1.50	1.39
Centrifuged supernatant density (g/mL)	1.08	1.21	NA	NA	NA	1.09	NA	1.01
Centrifuged solids density (g/mL)	NA	1.42	NA	NA	NA	1.59	NA	1.58
Vol% settled solids	NA	100[1]	100[1]	96.9	85.6	100[1]	NA	100[1]
Wt% settled solids	NA	100	100	NA	NA	100	NA	100
Vol% centrifuged solids	NA	63.1	75	38	26	70	NA	71
Wt% centrifuged solids	NA	66.8	NA	NA	NA	77.3	NA	78
Wt% total solids	7.84	31.2	39.3	25.7	23.0	42.8	58.5	41.6
Wt% oxides	NA	NA	NA	NA	NA	NA	35.8	35.6
Shear strength (10^4 dyne/cm)	NA	NA	1.64	NA	NA	NA	NA	NA
Penetration Resistance (lb/in.^{2})	NA	NA	3	NA	NA	NA	6	NA

Note:

[1]No settling observed after 2 days.

Table B2-137. Linear Fit Parameters for Shear Stress Versus Shear Rate.[1]

Waste:Water Dilution	Run	Yield Stress (Pa)	Consistency Index (Pa·s)	Correlation Coefficient[2]
1:1	1	10.3	0.0122	0.9804
	2	9.62	0.0124	0.9899
1:3	1	3.29	0.00806	0.9736
	2	3.37	0.00759	0.9896

Notes:

[1]Parameters to the bingham plastic model $\tau = a + b\gamma$ where τ is the shear stress (Pa), a is the yield stress (Pa), b is the consistency index (Pa·s), and γ is the shear rate (1/s).

[2]Correlation coefficient provides a measure of the fit between the Bingham plastic model and the behavior of the tank 241-AW-105 waste dilutions (a perfect fit would be a coefficient of 1).

B3.0 ASSESSMENT OF CHARACTERIZATION RESULTS

This section discusses the overall quality and consistency of the current sampling results for tank 241-AW-105 and provides the results of an analytical-based inventory calculation.

This section also evaluates sampling and analysis factors that may impact data interpretation. These factors are used to assess overall data quality and consistency and to identify limitations in data use.

B3.1 FIELD OBSERVATIONS

Two cores, 6 segments each, were expected from this tank during the 1997 core sampling event. Only the bottom six segments were obtained. Because grab samples of the liquid layer in the tank were obtained in August 1996, additional segments of the liquid were determined to be unnecessary.

Full waste recovery was achieved from all grab samples obtained in August 1996. Because of a field error in the requested sampling depth for sample 5AW-96-13, the tank coordinator directed the laboratory to analyze sample 5AW-96-14 instead (Esch 1997). No other anomalies were noted.

B3.2 QUALITY CONTROL ASSESSMENT

The usual QC assessment includes an evaluation of the appropriate standard recoveries, spike recoveries, duplicate analyses, and blanks that are performed in conjunction with the chemical analyses. Sample and duplicate pairs that had one or more QC results outside the specified criteria were identified by footnotes in the data summary tables (see Section B2).

The standard and spike recovery results provide an estimate of the accuracy of the analysis. If a standard or spike recovery is above or below the given criterion, the analytical results may be biased high or low, respectively. The precision is estimated by the RPD, which is defined as the absolute value of the difference between the primary and duplicate samples, divided by their mean, times 100.

B3.2.1 Quality Control Assessment of May 1997 Core Sample

All pertinent QC tests were conducted on the 1997 core samples, allowing a full assessment regarding the data's accuracy and precision. Specific criteria for the analytes required by the safety screening DQO were given in the SAP (Sasaki 1997), whereas the criteria governing the opportunistic analytes were given in DOE (1995).

All standard recoveries were within the defined criterion. Total alpha activity had one spike recovery below the limit for a sludge subsample. The spike recovery was within the laboratory statistical control limits for the QC standard, and no rerun was requested (Steen 1997).

Several spike recoveries were outside the control limits for fluoride and sodium. These low spike recoveries were caused by the high concentration of these analytes in the sample with respect to the amount of spike standard added. Following the sodium spike recoveries, a post-digestion spike analysis was performed as an additional instrument performance check. The post-digestion spike recoveries were all within the control limits. Total inorganic carbon and total uranium each exhibited one spike recovery above the limit for a drainable liquid subsample. These spike failures were caused by the high concentration of these analytes in the sample with respect to the amount of spike standard added (Steen 1997).

Total organic carbon exhibited seven RPDs in excess of the limit for the sludge subsamples. These high RPDs were attributed to the samples' heterogeneous nature. Total alpha activity had one RPD outside the limit on the sludge subsample because of sample heterogeneity. Four of the sludge subsamples for aluminum, iron, and sodium had RPDs outside the limits, also attributed to sample heterogeneity. Nine of the sludge subsamples for chloride, fluoride, phosphate, and sulfate had RPDs outside the limits caused by sample heterogeneity. Total uranium had two subsample RPDs outside the limit, $^{89/90}Sr$ had two subsample RPDs outside the limit, and ^{241}Am and $^{239/240}Pu$ each had one subsample RPD outside the limits, all attributed to sample heterogeneity. For DSC, 2 of 25 subsample RPDs were outside the limit, and for TGA, 1 of 25 subsample RPDs was outside the limit. The heterogeneous material and the small sample size required for these analyses made it difficult to obtain reproducible results.

Many ICP analytes had one or more QC parameters outside the specified limits. The poor spike recoveries for sodium may be caused by the high concentration of sodium in the samples (samples cannot be spiked to levels much greater than already present). The high concentrations of sodium required high dilutions for all ICP samples. These high dilutions can in turn cause poor or meaningless spike recoveries and RPDs for ICP elements that had either very high concentrations or were close to the detection limit. Finally, occasional preparation blanks showed results for total alpha and $^{89/90}Sr$ above the detection level. The levels of these contaminants in the preparation blanks are inconsequential when compared to the result for the sample and do not impact sample data quality (Steen 1997).

In summary, the QC results were excellent, and the few minor discrepancies mentioned here and footnoted in the data summary tables should not impact the data's validity or use.

B3.2.2 Quality Control Assessment of August 1996 Grab Sample

All pertinent QC tests were conducted on the 1996 grab samples, allowing a full assessment of the data's accuracy and precision. The specific criteria for the analytes required by the waste compatibility DQO were given in the SAP (Sasaki 1996), and the criteria governing the opportunistic analytes were given in DOE (1995).

Except for ^{241}Am, which had standard recoveries above the limit for an interstitial liquid and centrifuged solid sample, all standard recoveries were within the defined criterion. Total alpha activity had several spike recoveries slightly below the limit for the supernatant and interstitial liquid samples. These lower spike recoveries were probably caused by matrix interference from suspended solids in the samples, which negatively impacted the reproducibility of the results. These spike recoveries were all above 70 percent, and thus within the method control limit (Esch 1997). Nitrate had one spike recovery, and potassium and sodium had several spike recoveries outside the limits, probably caused by the high dilutions required to measure the large analyte concentrations. The high concentrations of nitrate and sodium required high dilutions for the other IC and ICP analytes. These high dilutions in turn can cause poor or meaningless RPDs for those elements that were near the detection limit.

Total organic carbon exhibited one RPD in excess of the limit for the centrifuged solids and one for the interstitial liquid. Because the results from the solid sample were consistent with the same sample from the other riser, and this sample was reported to be heterogeneous at the time of sample breakdown, no rerun was requested.

For the TOC interstitial liquid with a high RPD, a triplicate analyses, as well as an additional replicate analysis, was performed. These analyses were consistent with the original results, and the high RPD was probably caused by suspended solids in the sample (Esch 1997).

Four interstitial liquid samples and one supernatant sample for $^{89/90}$Sr had RPDs outside the limits, also attributed to the presence of suspended solids. Total alpha activity had two RPDs outside the limit on the liquid samples, because of suspended solids and low sample activities. Fluoride had one supernatant RPD outside the limit, because of suspended solids, and $^{239/240}$Pu had one centrifuged solid RPD slightly above the limit. For DSC, two of four centrifuged solid RPDs were outside the limits possibly because of sample heterogeneity small sample sizes, or small exothermic reactions. Finally, none of the samples exceeded the criteria for preparation blanks; thus, contamination was not a problem for any analyte.

In summary, the QC results were excellent, and the few minor discrepancies mentioned here and footnoted in the data summary tables should not impact either the validity or the use of the data.

B3.3 DATA CONSISTENCY CHECKS

This section assesses the data consistency and quality from the tank 241-AW-105 core and grab samples. Comparisons of different analytical methods can help to assess the consistency and quality of the data. In addition, mass and charge balances were calculated to help assess the overall data consistency.

B3.3.1 Comparison of Results from Different Analytical Methods

The following data consistency checks compare the results from two different analytical methods. Close agreement between the two methods strengthens the credibility of both results, but poor agreement brings the reliability of the data into question. All analytical mean results were taken from Section B2.0 tables.

B3.3.1.1 Analytical Method Comparison of Results from the May 1997 Core Sample. A comparison was made between the individual alpha emitters and the total alpha activity, in the fusion digested sludge subsamples, to determine the level of data consistency. The sum of the individual alpha emitters, ^{241}Am and $^{239/240}$Pu, in the sludge was 1.59 μCi/g. The total alpha activity as determined by proportional counting was 1.19 μCi/g. The RPD for the two determinations is 29 percent. No other comparisons were possible due to nondetected values.

B3.3.1.2 Analytical Method Comparison of Results from the August 1996 Grab Sample. A comparison was possible between the supernatant sulfur value as analyzed by ICP and the sulfate value as analyzed by IC. The supernatant analytical sulfur mean result as determined by ICP was 54.5 μg/mL, which converts to 163 μg/mL of sulfate. This result compares with the IC sulfate mean results of 284 μg/mL as calculated using both the detected and nondetected values and 199 μg/mL as calculated using the detected results only. No other comparisons were possible because of nondetected values.

B3.3.2 Mass and Charge Balance

The principal objective in performing mass and charge balances is to determine whether the measurements are consistent. The results of these comparisons are presented in section B3.3.2.1 for the May 1997 core samples and in section B3.3.2.2 for the August 1996 grab samples.

B3.3.2.1 Mass and Charge Balances for the May 1997 Core Sample Sludge. In calculating the mass and charge balances for the sludge layer, only those analytes listed in Table B3-7 detected at a concentration of 1,000 μg/g or greater were considered. Except sodium, all cations listed in Table B3-1 were assumed to be in their most common hydroxide or oxide form, and the concentrations of the assumed species were calculated stoichiometrically. Because precipitates are neutral species, all positive charge was attributed to the sodium cation. The carbonate data were derived from the TIC analyses, and the acetate data were derived from the TOC analyses. The anions listed in Table B3-2 were assumed to be present as sodium salts and were expected to balance the positive charge exhibited by the cations. The concentrations of cationic species in Table B3-1, the anionic species in Table B3-2, and the percent water were ultimately used to calculate the mass balance.

The mass balance was calculated from the formula below. The factor 0.0001 is the conversion factor from μg/g to weight percent.

Mass balance = % water + 0.0001 x {total analyte concentration}

= % water + 0.0001 x $\{Na^+ + UO_3 + ZrO(OH)_2 + Al(OH)_4^- + SiO_3^{2-} + CO_3^{2-} + C_2H_3O_2^- + F^- + OH^- + NO_3^- + NO_2^- + SO_4^{2-}\}$.

The total analyte concentration, calculated from the above equation, is 370,000 μg/g. The mean weight percent water is 64.5 percent, or 645,000 μg/g. The mass balance resulting from adding the percent water to the total analyte concentration is 101.6 percent (see Table B3-3).

The following equations demonstrate the derivation of total cations and total anions; the charge balance is the ratio of these two values.

Total cations (μeq/g) = $[Na^+]/23.0$ = 4,440 μeq/g

Total anions (μeq/g) = $[Al(OH)_4^-]/95.0 + [SiO_3^{2-}]/38.0 + [CO_3^{2-}]/30.0 + [C_2H_3O_2^-]/59.0 + [F^-]/19.0 + [OH^-]/17.0 + [NO_3^-]/62.0 + [NO_2^-]/46.0 + [SO_4^{2-}]/48.1$ = 4,410 μeq/g.

The charge balance obtained by dividing the sum of the positive charge by the sum of the negative charge was1.01. There is a net positive charge of 30 μeq/g.

In summary, thecalculations above yield reasonable mass and charge balance values (close to 1.00 for charge balance and 100 percent for mass balance), indicating that the analytical results for the sludge are generally consistent.

Table B3-1. Sludge Cation Mass and Charge Data for the May 1997 Core Samples.

Analyte	Concentration (μg/g)	Assumed Species	Concentration of Assumed Species (μg/g)	Charge (μeq/g)
Sodium	102,000	Na^+	102,000	4,440
Uranium	32,100	UO_3	38,600	0
Zirconium	65,800	$ZrO(OH)_2$	102,000	0
Total			242,600	4,440

Table B3-2. Sludge Anion Mass and Charge Data for the May 1997 Core Samples.

Analyte	Concentration (μg/g)	Assumed Species	Concentration of Assumed Species (μg/g)	Charge (μeq/g)
Aluminum	2,810	$Al(OH)_4^-$	9,890	104
Silicon	2,030	SiO_3^{2-}	5,510	145
TIC	1,480	CO_3^{2-}	7,400	247
TOC	5,100	$C_2H_3O_2^-$	12,500	213
Fluoride	49,700	F^-	49,700	2,620
Hydroxide	7,970	OH^-	7,970	469
Nitrate	25,600	NO_3^-	25,600	413
Nitrite	7,150	NO_2^-	7,150	155
Sulfate	2,120	SO_4^{2-}	2,120	44
Total			127,840	4,410

Table B3-3. Sludge Mass and Charge Balance Totals for the May 1997 Core Samples.

Totals	Concentrations (μg/g)	Charge (μeq/g)
Total from Table B3-1 (cations)	243,000	4,440
Total from Table B3-2 (anions)	128,000	4,410
Weight percent water	645,000	0
Grand total	1,016,000	+30

B3.3.2.2 Mass and Charge Balances for the August 1996 Grab Sample Supernatant. In calculating the mass and charge balances for the supernatant layer, only those analytes listed in Table B3-8 detected at a concentration of 1,000 μg/g or greater were considered. All analytical results were first converted from μg/mL to μg/g (using the supernatant specific gravity mean of 1.02 g/mL) before being used in the tables. Because this portion of the tank is supernatant, the cations listed in Table B3-4 and the anions listed in Table B3-5 were all assumed to be present as ions. The acetate data were derived from the TOC analyses. The concentrations of the cationic and anionic species, and the weight percent water results, were ultimately used to calculate the mass balance.

The mass balance was calculated from the formula below. The factor 0.0001 is the conversion factor from μg/g to weight percent.

$$\text{Mass balance} = \%\ \text{water} + 0.0001 \times \{\text{total analyte concentration}\}$$

$$= \%\ \text{water} + 0.0001 \times \{K^+ + Na^+ + C_2H_3O_2^- + OH^- + NO_3^- + NO_2^-\}.$$

The total analyte concentration, calculated from the above equation, is 51,000 μg/g. The mean weight percent water is 94.9, or 949,000 μg/g. The mass balance resulting from adding the percent water to the total analyte concentration is 100 percent (see Table B3-6).

The following equations demonstrate the derivation of total cations and total anions; the charge balance is the ratio of these two values.

Total cations (μeq/g) = $[K^+]/39.1 + [Na^+]/23.0 = 630\ \mu\text{eq/g}$

Total anions (μeq/g) = $[C_2H_3O_2^-]/59.0 + [OH^-]/17.0 + [NO_3^-]/62.0 + [NO_2^-]/46.0 = 740\ \mu\text{eq/g}$.

The charge balance obtained by dividing the sum of the positive charge by the sum of the negative charge was 0.85. There is a net negative charge of 110 μeq/g.

In summary, the above calculations yield reasonable mass and charge balance values (close to 1.00 for charge balance and 100 percent for mass balance), indicating that the analytical results for the supernatant are generally consistent.

Table B3-4. Supernatant Cation Mass and Charge Data for the August 1996 Grab Samples.

Analyte	Concentration (μg/g)	Assumed Species	Concentration of Assumed Species (μg/g)	Charge (μeq/g)
Potassium	1,600	K^+	1,600	41
Sodium	13,500	Na^+	13,500	589
Total			15,100	630

Table B3-5. Supernatant Anion Mass and Charge Data for the August 1996 Grab Samples.

Analyte	Concentration (μg/g)	Assumed Species	Concentration of Assumed Species (μg/g)	Charge (μeq/g)
TOC	2,320	$C_2H_3O_2^-$	5,700	97
Hydroxide	3,530	OH^-	3,530	208
Nitrate	25,400	NO_3^-	25,400	409
Nitrite	1,220	NO_2^-	1,220	26
Total			35,900	740

Table B3-6. Supernatant Mass and Charge Balance Totals for the August 1996 Grab Samples.

Totals	Concentrations (μg/g)	Charge (μeq/g)
Total from Table B3-4 (cations)	15,100	630
Total from Table B3-5 (anions)	35,900	740
Weight percent water	949,000	0
Grand total	1,000,000	-110

B3.4 MEAN CONCENTRATIONS AND CONFIDENCE INTERVALS

B3.4.1 May 1997 Core Sample Solid Data

A nested analysis of variance (ANOVA) model was fit to the core segment data. Mean values, and 95 percent confidence intervals on the mean, were determined from the ANOVA. Four variance components were used in the calculations. The variance components represent concentration differences between risers, segments, laboratory samples, and analytical replicates. The model is:

$$Y_{ijk} = \mu + R_i + S_{ij} + L_{ijk} + A_{ijkm},$$

$$I=1,2,\ldots,a;\ j=1,2,\ldots,b_i;\ k=1,2,\ldots,c_{ij};\ m=1,2,\ldots,n_{ijk}$$

where

Y_{ijkm}	=	concentration from the mth analytical result of the kth sample of the jth segment of the ith riser
μ	=	the mean
R_i	=	the effect of the ith riser
S_{ij}	=	the effect of the jth segment from the ith riser
L_{ijk}	=	the effect of the kth sample from the jth segment of the ith riser
A_{ijkm}	=	the analytical error
a	=	the number of risers
b_i	=	the number of segments from the ith riser
c_{ij}	=	the number of samples from the jth segment of the ith riser
n_{ijk}	=	the number of analytical results from the ijkth sample.

The variables R_i, S_{ij}, and L_{ijk} are random effects. These variables, as well as A_{ijkm}, are assumed to be uncorrelated and normally distributed with means zero and variances $\sigma^2(R)$, $\sigma^2(S)$, $\sigma^2(L)$ and $\sigma^2(A)$, respectively.

The restricted maximum likelihood method (REML) was used to estimate the mean concentration and standard deviation of the mean for all analytes that had 50 percent or more of their reported values greater than the detection limit. The mean value and standard deviation of the mean were used to calculate the 95 percent confidence intervals. Table B3-7 gives the mean, degrees of freedom, and confidence interval for each constituent in the tank solids.

Some analytes had results that were below the detection limit. In these cases, the value of the detection limit was used for nondetected results. For analytes with a majority of results below the detection limit, a simple average is all that is reported.

The lower and upper limits, LL(95%) and UL(95%), of a two-sided 95 percent confidence interval on the mean were calculated using the following equation:

$$LL(95\%) = \hat{\mu} - t_{(df, 0.025)} \times \hat{\sigma}(\hat{\mu}),$$
$$UL(95\%) = \hat{\mu} + t_{(df, 0.025)} \times \hat{\sigma}(\hat{\mu}).$$

In this equation, $\hat{\mu}$ is the REML estimate of the mean concentration, $\hat{\sigma}(\hat{\mu})$ is the REML estimate of the standard deviation of the mean, and $t_{(df, 0.025)}$ is the quantile from Student's t distribution with *df* degrees of freedom. The degrees of freedom equals the number of risers with data minus one. In cases where the lower limit of the confidence interval was negative, it is reported as zero.

Table B3-7. 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Segment Data. (3 sheets)

Analyte	Method	$\hat{\mu}$	*df*	Lower Limit	Upper Limit	Units
Aluminum[1]	ICP:F	2.81E+03	1	0.00E+00	1.48E+04	µg/g
^{241}Americium	AEA:F	5.14E-01	1	0.00E+00	2.05E+00	µCi/g
^{241}Americium[1]	GEA:F	9.31E-01	1	0.00E+00	4.76E+00	µCi/g
Antimony[1]	ICP:F	<1.25E+03	n/a	n/a	n/a	µg/g
Arsenic[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	µg/g
Barium[1]	ICP:F	<1.01E+03	n/a	n/a	n/a	µg/g
Beryllium[1]	ICP:F	<1.01E+02	n/a	n/a	n/a	µg/g
Bismuth[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	µg/g
Boron[1]	ICP:F	<1.01E+03	n/a	n/a	n/a	µg/g
Bromide[1]	IC:W	<8.97E+02	n/a	n/a	n/a	µg/g
Cadmium[1]	ICP:F	<1.26E+02	n/a	n/a	n/a	µg/g
Calcium[1]	ICP:F	<2.48E+03	n/a	n/a	n/a	µg/g

Table B3-7. 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Segment Data. (3 sheets)

Analyte	Method	$\hat{\mu}$	*df*	Lower Limit	Upper Limit	Units
Cerium[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	µg/g
^{137}Cesium	GEA:F	3.24E+01	1	0.00E+00	9.70E+01	µCi/g
Chloride[1]	IC:W	3.63E+02	1	0.00E+00	1.31E+03	µg/g
Chromium[1]	ICP:F	<1.18E+03	n/a	n/a	n/a	µg/g
Cobalt[1]	ICP:F	<4.06E+02	n/a	n/a	n/a	µg/g
^{60}Cobalt[1]	GEA:F	1.11E-01	1	0.00E+00	5.29E-01	µCi/g
Copper[1]	ICP:F	<2.02E+02	n/a	n/a	n/a	µg/g
^{154}Europium[1]	GEA:F	<3.23E-01	n/a	n/a	n/a	µCi/g
^{155}Europium[1]	GEA:F	<5.29E-01	n/a	n/a	n/a	µCi/g
Fluoride	IC:W	4.97E+04	1	0.00E+00	1.44E+05	µg/g
Gross Alpha	Alpha:F	1.19E+00	1	0.00E+00	5.18E+00	µCi/g
Hydroxide[1]	OH:W	7.97E+03	1	3.41E+03	1.25E+04	µg/g
Iron[1]	ICP:F	<3.76E+03	n/a	n/a	n/a	µg/g
Lanthanum[1]	ICP:F	<1.09E+03	n/a	n/a	n/a	µg/g
Lead[1]	ICP:F	<2.03E+03	n/a	n/a	n/a	µg/g
Lithium[1]	ICP:F	<2.02E+02	n/a	n/a	n/a	µg/g
Magnesium[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	µg/g
Manganese[1]	ICP:F	<2.23E+03	n/a	n/a	n/a	µg/g
Molybdenum[1]	ICP:F	<1.01E+03	n/a	n/a	n/a	µg/g
Neodymium[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	µg/g
Nitrate	IC:W	2.56E+04	1	2.26E+03	4.90E+04	µg/g
Nitrite	IC:W	7.15E+03	1	0.00E+00	2.25E+04	µg/g
Oxalate[1]	IC:W	<5.83E+03	n/a	n/a	n/a	µg/g
Percent water	DSC/TGA	6.45E+01	1	2.93E+01	9.97E+01	%
Phosphate[1]	IC:W	<2.15E+03	n/a	n/a	n/a	µg/g

Table B3-7. 95 Percent Two-Sided Confidence Interval for the Mean Concentration for Solid Segment Data. (3 sheets)

Analyte	Method	$\hat{\mu}$	*df*	Lower Limit	Upper Limit	Units
Phosphorus[1]	ICP:F	<4.05E+03	n/a	n/a	n/a	μg/g
$^{239/240}$Plutonium	Pu239/240:F	1.08E+00	1	0.00E+00	3.56E+00	μCi/g
Samarium[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	μg/g
Silicon[1]	ICP:F	2.03E+03	1	5.83E+01	4.00E+03	μg/g
Silver[1]	ICP:F	3.31E+02	1	0.00E+00	6.69E+02	μg/g
Sodium	ICP:F	1.02E+05	1	0.00E+00	2.63E+05	μg/g
Strontium[1]	ICP:F	<2.02E+02	n/a	n/a	n/a	μg/g
$^{89/90}$Strontium	Sr:F	5.85E+01	1	0.00E+00	3.89E+02	μCi/g
Sulfate[1]	IC:W	2.12E+03	1	0.00E+00	6.60E+03	μg/g
Sulfur[1]	ICP:F	<2.02E+03	n/a	n/a	n/a	μg/g
Thallium[1]	ICP:F	<4.05E+03	n/a	n/a	n/a	μg/g
Titanium[1]	ICP:F	<2.02E+02	n/a	n/a	n/a	μg/g
Total inorganic carbon	TIC/TOC	1.48E+03	1	0.00E+00	5.67E+03	μg/g
Total organic carbon	TIC/TOC	5.10E+03	1	0.00E+00	2.57E+04	μg/g
Uranium[1]	ICP:F	3.21E+04	1	0.00E+00	8.46E+04	μg/g
Uranium	U:F	1.84E+04	1	0.00E+00	8.42E+04	μg/g
Vanadium[1]	ICP:F	<1.01E+03	n/a	n/a	n/a	μg/g
Zinc[1]	ICP:F	<2.47E+02	n/a	n/a	n/a	μg/g
Zirconium[1]	ICP:F	6.58E+04	1	0.00E+00	1.59E+05	μg/g

Note:

[1] A "less than" value was used in the calculations.

B3.4.2 August 1996 Grab Sample Supernatant Data

The statistics in this section are based on analytical data from the tank 241-AW-105 August 1996 sampling event. A statistical model is needed to account for the spatial and measurement variability in $\hat{\sigma}_{\hat{\mu}}$. This cannot be done using an ordinary standard deviation of the data (Snedecor and Cochran 1980).

The nested ANOVA technique was used to estimate the mean and its associated variability for all analytes that had at least 50 percent of the reported data as quantitative values. The nested ANOVA statistical model used to describe the structure of the data is:

$$Y_{ijk} = \mu + R_i + S_{ij} + A_{ijk},$$

$$I = 1,2,\ldots,a; \; j = 1,2,\ldots,b_i; \; k = 1,2,\ldots,n_{ij};$$

where

Y_{ijk}	=	concentration from the k^{th} analytical result from the j^{th} grab sample from the i^{th} riser
μ	=	the grand mean
R_i	=	the effect of the i^{th} riser
S_{ij}	=	the effect of the j^{th} grab sample from the i^{th} riser
A_{ijk}	=	the effect of the k^{th} analytical result from the j^{th} grab sample from the i^{th} riser
a	=	the number of risers
b_i	=	the number of grab samples from the i^{th} riser
n_{ij}	=	the number of analytical results from the j^{th} grab sample from the i^{th} riser.

The variables R_i and S_{ij} are assumed to be random effects. These variables, as well as A_{ijk}, are assumed to be uncorrelated and normally distributed with means zero and variances $\sigma^2(R)$, $\sigma^2(S)$, and $\sigma^2(A)$, respectively. Estimates of $\sigma^2(R)$, $\sigma^2(S)$, and $\sigma^2(A)$ were obtained using REML techniques. This method applied to variance component estimation is described in Harville (1977). The results using the REML techniques were obtained using the statistical analysis package S-PLUS[1] (Statistical Sciences 1993). The *df* associated with the standard deviation of the mean (a function of $\sigma^2(R)$, $\sigma^2(S)$, and $\sigma^2(A)$) is the number of risers minus one.

No ANOVA estimates were computed for analytes that had less than 50 percent of the reported data as quantitative values. For those analytes with a mixture of both quantitative values and "less than" values, the ANOVA was computed using two different methodologies. Results of

[1]S-PLUS is a registered trademark of Statistical Sciences, Seattle, Washington.

both methodologies are presented in the following tables and are footnoted to indicate the methodology used.

The upper value of the "less than" result (for example, 3.5 for <3.5) was used to represent all "less than" analytical values in the first computation. This produces a bias of unknown magnitude in both the mean analyte concentration and the variance associated with the mean; the mean analyte concentration is biased high. The extension ".lt" was added to the analytes name in the tables to distinguish which analyte was statistically analyzed using "less than" values.

The "less than" values were deleted in the second computation. Deleting data produces unbalanced data sets that complicates the statistical analysis. Deleting data decreases the number of degrees of freedom. Deleting data also produces a bias of unknown magnitude in both the mean analyte concentration and the variance associated with the mean. The extension ".nlt" was added to the analytes name in the tables to distinguish which analyte was statistically analyzed with no "less than" values.

A mean concentration and the associated variability were calculated for each analyte.
A two-sided 95 percent confidence interval for the mean concentration was also calculated for each analyte. The confidence interval takes into account sampling and analytical uncertainties. The upper and lower limits of a two-sided 95 percent confidence interval for the mean are

$$\hat{\mu} \pm t_{(df,0.025)} \times \hat{\sigma}_{\hat{\mu}}.$$

In this equation, $\hat{\mu}$ is the estimate of the mean concentration, $\hat{\sigma}_{\hat{\mu}}$ is the estimate of the standard deviation of the mean concentration, and $t_{(df,0.025)}$ is the quantile from Student's t distribution with degrees of freedom (df) for a two-sided 95 percent confidence interval. The mean, $\hat{\mu}$, and the standard deviation of the mean, $\hat{\sigma}_{\hat{\mu}}$, were estimated using REML methods.

The supernatant mean concentration estimates, along with the two-sided 95 percent confidence interval for the mean concentration, are given in Table B3-8 for those analytes with at least 50 percent of the reported data as quantitative values. For some of the analytes, the lower limit of the 95 percent confidence interval was a negative value because of the magnitude of the variability. Because the actual concentration of a tank sample cannot be less than zero, the lower limit is reported as zero. The analytes with less than 50 percent of the reported data as quantitative values are listed in Table B3-9. Table B3-9 cites the largest value observed from the six analytical results.

Table B3-8. Tank 241-AW-105 Supernatant Summary Statistics Mean Concentrations.

Analyte	Units	$\hat{\mu}$	$\hat{\sigma}_{\hat{\mu}}$	*df*	Lower Limit	Upper Limit
ICP.a.Ag	μg/mL	1.16	0.0888	1	0.0274	2.28
ICP.a.Al	μg/mL	28.6	12.0	1	0	181
ICP.a.B	μg/mL	3.31	0.549	1	0	10.3
IC.Cl^-	μg/mL	243	14.2	1	62.7	424
ICP.a.Co.lt	μg/mL	2.62E-04	1.63E-04	1	0	0.00233
ICP.a.Co.nlt	μg/mL	2.67E-04	1.60E-04	1	0	0.00229
ICP.a.Cr	μg/mL	1.20	0.569	1	0	8.43
GEA.^{137}Cs	μCi/mL	1.42	0.668	1	0	9.91
IC.F^-	μg/mL	311	160	1	0	2,340
ICP.a.K	μg/mL	1,630	347	1	0	6,030
IC.NO_2^-	μg/mL	1,240	113	1	0	2,670
IC.NO_3^-	μg/mL	25,900	1,680	1	4,480	47,300
ICP.a.Na	μg/mL	13,800	992	1	1,210	26,400
OH^-	μg/mL	3,600	332	1	0	7,820
ICP.a.P	μg/mL	20.1	6.88	1	0	107
ICP.a.S	μg/mL	54.5	8.19	1	0	159
IC.SO_4^{2-}.lt	μg/mL	284	92.2	1	0	1,460
IC.SO_4^{2-}.nlt	μg/mL	199	11.0	1	59.4	338
ICP.a.Si	μg/mL	45.3	3.04	1	6.61	83.9
Specific gravity	---	1.02	0.00583	1	0.948	1.10
$^{89/90}$Sr	μCi/mL	0.0189	0.00419	1	0	0.0721
TIC[1]	μg/mL	306	119	1	0	1,820
TOC	μg/mL	2,370	817	1	0	12,800
TGA. % water	wt%	94.9	0.307	1	91.0	98.8
ICP.a.Zn[1]	μg/mL	2.41	1.01	1	0	15.2
Direct.pH	pH units	13.5	0.0360	1	13.0	13.9

Note:

.lt = Upper value of the "less thans" used in the statistical analysis.
.nlt = Less than values deleted in the statistical analysis.

[1] $\hat{\sigma}_{riser}$ is significantly different from zero.

Table B3-9. Tank 241-AW-105 Supernatant Analytes - Greater Than 50 Percent "Less Than" Values.

Analyte	Unit	Result
Total alpha	µCi/mL	<3.15E-04
AEA.^{241}Am	µCi/mL	<7.94E-06
ICP.a.As	µg/mL	<4.1
ICP.a.Ba	µg/mL	<2.05
ICP.a.Be	µg/mL	<0.205
ICP.a.Bi	µg/mL	<4.1
IC.Br^{-}	µg/mL	<644
ICP.a.Ca	µg/mL	6.23
ICp.a.Cd	µg/mL	<0.205
ICP.a.Ce	µg/mL	<4.1
GEA.^{60}Co	µg/mL	<0.820
ICP.a.Cu	µg/mL	<0.410
ICP.a.Fe	µg/mL	<2.05
ICP.a.La	µg/mL	<2.05
ICP.a.Li	µg/mL	<0.410
ICP.a.Mg	µg/mL	<4.1
ICP.a.Mn	µg/mL	<0.410
ICP.a.Mo	µg/mL	<2.05
ICP.a.Nd	µg/mL	<4.1
ICP.a.Ni	µg/mL	<0.820
IC.Oxalate	µg/mL	<541
IC.PO_4^{3-}	µg/mL	<618
ICP.a.Pb	µg/mL	<4.1
$^{239/240}$Pu	µCi/mL	<4.80E-06
ICP.a.Sb	µg/mL	<2.46
ICP.a.Se	µg/mL	<4.1
ICP.a.Sm	µg/mL	<4.1
ICP.a.Sr	µg/mL	<0.410
ICP.a.Ti	µg/mL	<0.410
ICP.a.Tl	µg/mL	<8.2
ICP.a.U	µg/mL	<20.5
ICP.a.V	µg/mL	<2.05
ICP.a.Zr	µg/mL	<0.410

B4.0 APPENDIX B REFERENCES

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APPENDIX C

STATISTICAL ANALYSIS FOR ISSUE RESOLUTION

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APPENDIX C

STATISTICAL ANALYSIS FOR ISSUE RESOLUTION

Appendix C documents results of the statistical analyses and numerical manipulations required by the DQOs applicable for tank 241-AW-105. The analyses required for tank 241-AW-105 are reported as follows:

- **Section C1.0**: Statistical analysis and numerical manipulations supporting the safety screening DQO (Dukelow et al. 1995).
- **Section C2.0**: Appendix C references.

C1.0 STATISTICS FOR THE SAFETY SCREENING DATA QUALITY OBJECTIVE

The safety screening DQO (Dukelow et al. 1995) defines decision limits in terms of one-sided 95 percent confidence intervals. The safety screening DQO limits are 61.5 μCi/mL for gross alpha and 480 J/g dry weight for DSC. Confidence intervals were calculated for each sample using the analytical data from the 1996 grab sampling event (Esch 1997) and the 1997 core sampling event (Steen 1997).

The upper limit of a one-sided 95 percent confidence interval on the mean is

$$\hat{\mu} + t_{(df,0.05)}\,\hat{\sigma}_{\hat{\mu}}.$$

In this equation, $\hat{\mu}$ is the arithmetic mean of the data, $\hat{\sigma}_{\hat{\mu}}$ is the estimate of the standard deviation of the mean, and $t_{(df,0.05)}$ is the quantile from Student's t distribution with *df* degrees of freedom. The degrees of freedom equals the number of samples minus one.

C1.1 TOTAL ALPHA ACTIVITY STATISTICAL ANALYSIS

For the samples with at least one total alpha activity value above the detection limit, the upper limit of a 95 percent confidence interval is given in Table C1-1. Each confidence interval can be used to make the following statement. If the upper limit is less than 47.3 μCi/g (61.5 μCi/mL for drainable liquid), reject the null hypothesis that the alpha activity is greater than or equal to 47.3 μCi/g (61.5 μCi/mL for drainable liquid) at the 0.05 level of significance.

All 13 total alpha activity solids results from the 1997 core samples were above the detection limit but well below the limit of 47.3 µCi/g. The solids upper limit closest to the threshold was 5.14 µCi/g for core 196, segment 4, lower half. No gross alpha supernatant results from the 1996 grab samples were above the detection limit; therefore, the calculation of confidence intervals was not possible. The maximum value observed for the 1996 supernatant samples was <3.15E-04 µCi/mL, which is less than the total alpha activity limit of 61.5 µCi/mL. Based on results from the 1996 grab sample and 1997 core sample, criticality is not an issue for this tank.

Table C1-1. 95 Percent Upper Confidence Limits for Total Alpha Activity.

Lab Sample ID	Description	$\hat{\mu}$	*df*	Upper Limit	Units
S97T001174F	Core 195, segment 4, lower half	1.34E+00	1	1.72E+00	µCi/g
S97T001175F	Core 195, segment 5, lower half	5.00E-01	1	5.00E-01	µCi/g
S97T001176F	Core 195, segment 6, lower half	1.13E+00	1	1.64E+00	µCi/g
S97T001177F	Core 195,segment 7, lower half	2.07E-01	1	3.02E-01	µCi/g
S97T001178F	Core 195, segment 8, lower half	5.10E-01	1	5.57E-01	µCi/g
S97T001179F	Core 195, segment 9, lower half	2.52E+00	1	2.62E+00	µCi/g
S97T001219F	Core 196, segment 4, lower half	3.79E+00	1	5.14E+00	µCi/g
S97T001220F	Core 196, segment 5, lower half	4.45E-01	1	4.96E-01	µCi/g
S97T001221F	Core 196, segment 6, lower half	7.60E-01	1	1.08E+00	µCi/g
S97T001222F	Core 196, segment 7, lower half	2.84E-01	1	2.88E-01	µCi/g
S97T001223F	Core 196, segment 8, lower half	7.42E-01	1	9.50E-01	µCi/g
S97T001224F	Core 196, segment 9, lower half	1.94E+00	1	4.09E+00	µCi/g
S97T001752F	Core 196, segment 9, lower half	2.22E+00	1	2.35E+00	µCi/g

C1.2 DIFFERENTIAL SCANNING CALORIMETRY STATISTICAL ANALYSIS

For the samples with at least one DSC value above the detection limit, the upper limit of a 95 percent confidence interval is given in Table C1-2. Each confidence interval can be used to make the following statement. If the upper limit is less than 480 J/g, reject the null hypothesis that DSC is greater than or equal to 480 J/g at the 0.05 level of significance.

Two DSC solids results from the 1997 core samples were above the detection limit but well below the limit of 480 J/g dry weight. The maximum upper limit to a 95 percent confidence interval on the mean for DSC was 19.3 J/g dry weight, for core 195, segment 7, upper half. All six DSC supernatant results from the 1996 grab samples had results of 0.0 J/g dry weight. Based on results from the 1996 grab sample and 1997 core sample, energetics is not an issue for this tank.

Table C1-2. 95 Percent Upper Confidence Limits for Differential Scanning Calorimetry.

Lab Sample ID	Description	$\hat{\mu}$	*df*	Upper Limit	Units (Dry Weight)
S97T001103[1]	Core 195, segment 7, upper half	2.65E+00	1	1.93E+01	J/g
S97T001104[1]	Core 195, segment 8, upper half	1.13E+00	1	8.28E+00	J/g

Note:

[1] An endothermic result was used as an exothermic value of 0 J/g.

C2.0 APPENDIX C REFERENCES

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Esch, R. A., 1997, *Tank 241-AW-105, Grab Samples, 5AW-96-1 through 5AW-96-20 Analytical Results for the Final Report*, WHC-SD-WM-DP-214, Rev. 0, Rust Federal Services of Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

Steen, F. H., 1997, *Tank 241-AW-105, Cores 195 and 196 Analytical Results for the Final Report*, HNF-SD-WM-DP-250, Rev. 0, Rust Federal Services of Hanford, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

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APPENDIX D

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-AW-105

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APPENDIX D

EVALUATION TO ESTABLISH THE BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-AW-105

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of available chemical information for double-shell tank 241-AW-105 was performed, and a best-basis inventory was established. This work, detailed in the following sections, follows the methodology that was established by the standard inventory task.

D1.0 CHEMICAL INFORMATION SOURCES

Available composition information for tank 241-AW-105 is as follows:

- Appendix B of this report provides characterization results from the January 1986 grab sampling event, the July and September 1986 core sampling events, the 1990 core sampling event, the August 1996 grab sampling event, and the May 1997 core sampling event.

- An estimate of neutralized current acid waste and NCRW made in 1991 (Schofield 1991) provides a tank content estimate based on a reconciliation of flowsheet records, process tests, and the January 1986 and July 1986 sampling events.

- The letter report, *Characterization of Actual Zirflex Decladding Sludge* (Scheele and McCarthy 1986), provides characterization results of the grab samples taken in January 1986 and analyzed by Pacific Northwest Laboratory.

- The internal memorandum, *Analysis of Neutralized Coating Removal Waste (NCRW) Core Samples from Tank 105-AW* (Peters 1986), summarizes results obtained by the Rockwell Hanford Operations laboratories of the July 1986 core sample analyzed by Pacific Northwest Laboratory.

- The HDW model document (Agnew et al. 1997) provides tank content estimates in terms of component concentrations and inventories.

D2.0 COMPARISON OF COMPONENT INVENTORY VALUES

The tank 241-AW-105 chemical and radionuclide inventories predicted from the HDW model estimates (Agnew et al. 1997), and previous best-basis estimates, are shown in Tables D2-1 and D2-2. The chemical species are reported without charge designation according to the best-basis inventory convention. The HDW model inventory estimates are based on a volume of 3,940 kL (1,040 kgal) and a density of 1.18 g/mL. The previous best-basis supernatant inventory estimates are based on a volume of 606 kL (160 kgal). The previous best-basis sludge inventory estimates are based on a volume of 1,060 kL (280 kgal) and a density of 1.39 g/mL for July 1986 sludge samples, 1.32 g/mL for September 1986 sludge samples, and 1.42 g/mL for May 1990 sludge samples.

Table D2-1. Comparison of Inventory Estimates for Nonradioactive Components in Tank 241-AW-105. (2 sheets)

Analyte	HDW[1] Inventory Estimate (kg)	Previous Best Basis Estimate[2] (kg)
Al	24,200	3,530
Bi	112	112
Ca	7,300	7,300
Cl	6,210	743
Cr	3,540	1,170
F	91,200	77,600
Fe	27,400	2,770
Hg	347	347
K	25,200	11,900
La	1.35	443
Mn	797	1,420
Na	352,000	164,000
Ni	1,090	200
NO_2	47,700	11,500
NO_3	279,000	54,900
OH	182,000	14,200
Pb	133	1,080
PO_4	18,800	2,110
Si	1,500	5,310

Table D2-1. Comparison of Inventory Estimates for Nonradioactive Components in Tank 241-AW-105. (2 sheets)

Analyte	HDW[1] Inventory Estimate (kg)	Previous Best Basis Estimate[2] (kg)
SO_4	14,600	1,640
Sr	0	12.0
TIC as CO_3	48,000	11,400
TOC	2,640	8,380
U_{TOTAL}	13,600	12,800
Zr	69,300	98,800

Notes:

[1]Agnew et al. (1997)
[2]Effective October 31, 1996 (LMHC 1998)

Table D2-2. Comparison of Inventory Estimates for Selected Radioactive Components in Tank 241-AW-105 (Decayed to January 1, 1994).

Analyte	HDW[1] Inventory Estimate (Ci)	Previous Best Basis Estimate[2] (Ci)
^{14}C	15.9	2.26
^{90}Sr	81,200	263,000
^{99}Tc	116	108
^{129}I	0.224	0.00172
^{137}Cs	120,000	53,700
^{154}Eu	428	273
^{155}Eu	341	199
^{237}Np	0.439	0.0125
$^{239/240}Pu$	1,390	821
^{241}Pu	13,200	14,800
^{241}Am	101	472
^{60}Co	30.3	3.15

Notes:

[1]Agnew et al. (1997)
[2]Effective October 31, 1996 (LMHC 1998)

D3.0 COMPONENT INVENTORY EVALUATION

An evaluation of tank contents was performed to identify potential errors and/or missing information that would influence the sample-based and HDW model component inventories.

D3.1 WASTE HISTORY

The first waste received by tank 241-AW-105 was a small amount of flush water in August 1980. Later that month, the tank received complexed concentrate waste from the 242-A Evaporator (Teats 1982). In the third quarter of 1982 and the first quarter of 1983, the tank received dilute noncomplexed waste from tanks 241-AW-103, 241-AW-104, and B Plant, respectively. In the second quarter of 1983, waste was transferred to tank 241-AW-101 and 241-AW102, leaving only 193 kL (51 kgal) of waste in tank 241-AW-105. From the second quarter of 1983 to the third quarter of 1984, the tank was a receiver for PUREX dilute complexed waste. During this period, the tank also received dilute noncomplexed waste from various tanks and transferred waste into and out of tank 241-AW-102 in support of evaporator operations.

In 1984, waste was sent from tank 241-AW-105 to tanks 241-AZ-102 and 241-AN-101. From the third quarter of 1984 to the second quarter of 1988, the tank received sludge and supernatant decladding waste from PUREX. In 1985, tank 241-AW-105 received salt well liquor from various single-shell tanks. A small amount of waste from an unknown source was received in the second quarter of 1989.

From the third quarter of 1988 through the first quarter of 1990, tank 241-AW-105 received spent metathesis waste from PUREX. The tank resumed receiving noncomplexed waste from PUREX from the third quarter of 1992 through the second quarter of 1996. This waste consists of process solutions such as sump water, steam condensate, rainwater, and laboratory waste. Throughout its operation, the tank received numerous transfers of flush water from various sources. Most of the water probably came from line flushes following waste transfers. In the fourth quarter of 1994, dilute noncomplexed waste was transferred to tank 241-AP-108 and in the fourth quarter of 1995, dilute noncomplexed waste was transferred to tank 241-AP-104.

D3.2 CONTRIBUTING WASTE TYPES

The TLM (Agnew et al. 1997) predicts that the tank contains a total waste volume of 1,120 kL (297 kgal). The waste is predicted to consist of 95 kL (25 kgal) of PUREX low-level waste); 811 kL (215 kgal) of reduction-oxidation zirconium cladding, coating waste (CWZr2) from the 1983-88 PUREX campaign; and 220 kL (57 kgal) of concentrated SMMA2 generated from 1981 until 1994, predicted from the SMM.

Hanlon (1998) reports 1,640 kL (434 kgal) of waste that consists of 965 kL (255 kgal) of sludge, 678 kL (179 kgal) of supernatant, and 90.8 kL (24 kgal) of drainable interstitial liquid.

D3.3 ASSUMPTIONS USED

An engineering evaluation based on tank 241-AW-105 sample results was conducted to predict tank contents and compare results with the previous best-basis and HDW model results. The engineering evaluation assumes the following:

- The total tank volume listed in Hanlon (1998) is used (1,640 kL [434 kgal]).
- The liquid and solids volumes used to calculate analyte inventories are specified in Section D3.2. Based on the 1997 push mode core sample results, the sludge analytical mean density is 1.31 g/mL. Based on the 1996 grab sample results, the supernatant specific gravity is 1.02.
- Only the CWZr2 and PUREX low-level waste streams contributed to solids formation.
- All radionuclide data are corrected to January 1, 1994.

D3.4 BASIS FOR CALCULATIONS USED IN THIS ENGINEERING EVALUATION

Because the results from the July 1986 core sample and the September 1986 core sample were consistent with each other (see Table B2-132 and Table B2-133), and the sample results from the September core were more complete, only these values will be used in further comparisons.

Each core sample was taken from a different riser: the September 1986 core sample was taken from riser 15A (see Figure A2-1), the May 1990 core sample was taken from riser 16B, and the May 1997 core samples were taken from risers 10A and 12A. Lateral heterogeneity in the tank may cause some variations between the core sample results.

D3.4.1 Zirconium Cladding Coating Waste Sludge

This waste, called CWZr2, is also referred to as NCRW, and was produced during the 1983-88 PUREX campaign. Repeated transfers of PUREX NCRW to tank 241-AW-105 have resulted in a substantial sludge layer in the tank bottom. The NCRW solids were allowed to settle and accumulate in the tank, and the NCRW supernatant was periodically transferred to tank 241-AW-102 as feed for the 242-A Evaporator.

The May 1997 core sampling event collected segments from the entire depth of the sludge layer; including solids added since 1986. Included with these solids were additions of 8,220 kg (18,100 lbs) of uranium and 6.97 kg (15.4) of plutonium present in a dilute nitric acid solution that had been stored in the PUREX plant (Sasaki 1995). The sludge occupies 236 cm (93 in.) of the tank. Although the sludge level has decreased since 1986, solids have been added to tank 241-AW-105. Table A3-1 shows that 121 kL (32 kgal) of PUREX plant spent metathesis solids and decladding wastes were added, as well as some transuranic solids that may have settled from a dilute complexed waste stream sent from the hot semi-works pilot plant. Solids formed a layer of 29.6 cm (11.6 in.) in the tank. To account for this, segment 4 from the May 1997 core sampling event was not included in the comparison. This should eliminate solids added after 1986, and enable a direct comparison of the May 1997 results with the other core results.

The average of segments 2A, 3A, 4A, and 5A from the September 1986 core sample, the composite of segments 3 through 6 from the May 1990 core sample, and the average of segments 5, 6, 7, and 8 from the May 1997 core samples were used for the comparison (see Table D3-1) instead of comparing the entire core composites. These portions of the four cores do not include the 30.5-cm (12-in.) heel. The 1990 core sample may include solids added after 1986, but sample depths could not be determined (see Section B2.3.4). In the absence of this information, the core composite was used in the comparison. For segment concentrations below the detection limit, the detection limits were included to compute the average.

Table D3-1. Tank 241-AW-105 Waste Type CWZr2 Concentrations. (2 sheets)

Analyte	September 1986 Solids Analytical Mean[1] µg/g	May 1990 Solids Analytical Mean[2] µg/g	May 1997 Solids Analytical Mean[3] µg/g	HDW Model Waste Type CWZr2[4] µg/g
Al	1,170	1,460	1,490	0
Bi	n/r	n/r	<2,010	0
Ca	130	557	<2,010	2,950
Cl	345	1,500	343	109
CO_3	4,490	9,500	5,530	4,410
Cr	115	361	<264	0
F	58,300	71,800	58,800	77,800
Fe	270	2,360	<1,840	15,700
Hg	n/r	n/r	n/r	326
K	9,750	15,200	n/r	5,780

Table D3-1. Tank 241-AW-105 Waste Type CWZr2 Concentrations. (2 sheets)

Analyte	September 1986 Solids Analytical Mean[1] µg/g	May 1990 Solids Analytical Mean[2] µg/g	May 1997 Solids Analytical Mean[3] µg/g	HDW Model Waste Type CWZr2[4] µg/g
La	405	1,060	<1,120	0
Mn	6.00	878	<630	0
Na	99,800	10,700	112,000	98,000
Ni	60.0	109	n/r	0
NO_2	4,940	7,700	6,800	327
NO_3	20,300	21,500	23,200	15,900
Pb	n/r	249	<2,010	0
PO_4	n/r	1,000	<1,310	0
Si	4,130	2,740	1,910	0
SO_4	916	1,000	2,180	0
Sr	5.25	n/r	<201	0
TOC	3,460	2,900	3,080	0
U	5,370	7,900	26,200	7,350
Zr	71,200	96,500	76,500	65,500
density (g/mL)	1.28	1.39	1.32	1.29
Radionuclides (µCi/g)				
Total alpha	n/r	n/r	n/r	n/r
^{90}Sr	n/r	81.5	20.5	3.26
^{137}Cs	33.5	69.2	28.8	3.85

Notes:

[1]Average of segments 2A, 3A, 4A, and 5A

[2]Composite of segments 3, 4, 5, and 6. Cations converted to wet weight basis based on wt% total solids reported for composite 3-6

[3]Average of segments 5, 6, 7, and 8

[4]Agnew et al. (1997), Appendix B, reduction-oxidation zirconium cladding, coating waste stream

From Table D3-1, the 1997 core sample concentrations compared well with the 1986 and 1990 results, with the exception of uranium. This may be because of settled solids from the high-uranium bearing waste received in early 1995. The 1990 core sample concentrations for nonradioactive components, except for sodium, were higher than the 1986 and 1997 results, possibly because ofuranium interference during ICP analysis. Yet, the sodium concentrations were significantly lower in the 1990 core sample results. For radioactive components; the 1990 concentrations were approximately 3 to 4 times higher than the 1986 and 1997 results. The HDW model predictions, while being closer to the 1986 and 1997 concentrations, still do not agree well with the sample-based numbers.

D3.4.2 PUREX Low-Level Waste Sludge

This waste, PUREX low-level waste sludge, also referred to as PXMSC, was also produced during the 1983-1988 PUREX campaign. Tank 241-AW-105 received approximately 7,030 kL (1,857 kgal) of PXMSC wastes and some dilute noncomplexed waste from tank 241-AW-103 through 1983 and 1984. Starting in 1984, tank 241-AW-105 received NCRW in addition to small transfers of PXMSC and flush water.

The 30.5-cm (12-in.) heel of dark solids in the tank bottom probably came from these PXMSC additions (Peters 1986). 30.5 centimeters of waste corresponds to a volume of 125 kL (33 kgal), which means the 7,030 kL (1,857 kgal) of PXMSC contained an average of 1.8 volume percent solids, not an unreasonable number.

A composition for the 30.5-cm (12-in.) heel can be estimated by assuming that a portion of the core segment has the same composition as the segment above it (assumed to represent NCRW); then back-calculating the composition of the remaining 30.5 cm (12 in.). Table D3-2 shows the calculated heel compositions compared to the HDW model composition for PUREX low-level waste.

Table D3-2. Tank 241-AW-105 Waste Type PUREX Low-Level Waste Concentrations. (2 sheets)

Analyte	September 1986 Solids Analytical Mean[1] µg/g	May 1990 Solids Analytical Mean[2] µg/g	May 1997 Solids Analytical Mean[3] µg/g	HDW Model Waste Type PUREX Low-Level[4] µg/g
Al	7,340	21,400	9,000	0
Bi	n/r	n/r	<2,060	0
Ca	2,770	572	4,000	15,300
Cl	755	1,900	514	102
CO_3	19,300	28,500	18,500	27,400
Cr	3,840	10,200	4,450	308
F	34,300	22,000	35,500	0
Fe	9,110	11,300	11,100	88,200
Hg	n/r	n/r	n/r	0
K	2,350	2,760	n/r	198
La	42.0	96.5	<1,030	0
Mn	5,630	3,220	8,220	244
Na	113,000	14,900	129,000	10,900
Ni	599	325	n/r	5,450
NO_2	18,300	30,000	13,100	340
NO_3	56,600	81,000	34,700	11,800
Pb	n/r	796	<2,060	6.65
PO_4	n/r	1,300	<6,390	4,880
Si	1,840	1,790	2,700	0
SO_4	1,740	5,600	2,500	287
Sr	29.0	n/r	<206	0
TOC	12,600	29,300	15,200	363
U	18,200	7,310	42,400	11,100
Zr	48,100	13,800	58,400	0
density (g/mL)	1.385	1.50	1.345	1.20

Table D3-2. Tank 241-AW-105 Waste Type PUREX Low-Level Waste Concentrations. (2 sheets)

Analyte	September 1986 Solids Analytical Mean[1] µg/g	May 1990 Solids Analytical Mean[2] µg/g	May 1997 Solids Analytical Mean[3] µg/g	HDW Model Waste Type PUREX Low-Level[4] µg/g
Radionuclides (µCi/g)				
Total alpha	n/r	n/r	n/r	n/r
^{90}Sr	n/r	300	223	0
^{137}Cs	96.3	176	61.4	0

Notes:

[1]Based on the average of segments 6A and 6B

[2]Based on segment 7. Cations converted to wet weight basis based on wt% total solids for segment 7.

[3]Based on the average of subsamples 195:9 and 196:9

[4]Agnew et al. (1997), Appendix B, PUREX low-level waste stream

From Table D3-2, the 1997 core sample concentrations compared extremely well with the 1986 results, with the exception of uranium. The 1990 core sample concentrations did not compare well with the 1986 or the 1997 results. The results from the ICP analyses were generally higher for the 1990 samples versus the 1986 and 1997 samples, with the exception of calcium, sodium, and zirconium, which were significantly lower. This difference may have been caused by uranium interference during ICP analysis. The results from the IC analyses were 2 to 4 times higher for the 1990 samples versus the 1986 and 1997 samples, with the exception of fluoride. For radioactive components; the 1990 concentrations were slightly higher than the 1986 and 1997 results. The HDW model predictions do not agree well with the sample-based numbers.

D3.4.3 Supernatant

Supernatant data from previous core sampling events and predictions made by the HDW model have been made irrelevant by periodic transfers of waste into and out of tank 241-AW-105. The most recent data obtained for the supernatant come from the August 1996 grab sampling event. The previous supernatant sampling event was in August 1995, when three grab samples were taken. Transfers of PXMSC waste into tank 241-AW-105 and transfers from tank 241-AW-105 to tank 241-AP-104 in December 1995 have made the August 1995 sample results no longer applicable. Relatively few analyte concentrations were reported from that sample analysis, which was conducted for waste compatibility purposes only.

The August 1996 supernatant sample concentrations have a high pedigree associated with them. These samples covered a range of 300 to 394 cm (118 to 155 in.) from the tank bottom. The supernatant layer begins at approximately 236 cm (93 in.) and rises up to 401 cm (158 in.) from the tank bottom. From Table B2-80 through B2-125, there is evidence of some waste stratification. There is a concentration gradient for most components that increase with increasing depth.

The liquid mean concentrations to be used for the best-basis inventories were derived from the supernatant samples and interstitial liquid sample 5AW-96-5 (see Tables B2-126 and B2-127). Interstitial liquid sample 5AW-96-5 was determined to be representative of the tank liquid layer rather than solids because it was taken very close to the interface between the supernatant and the sludge layers. The analytical mean concentrations shown in Table D3-3 were calculated using a linear mean of the six supernatant and interstitial liquid 5AW-96-5 sample results.

Table D3-3. Tank 241-AW-105 Liquid Concentrations. (2 sheets)

Component	August 1996 Supernatant Analytical Mean (μg/mL)	August 1996 Interstitial Liquid Sample 5AW-96-5 (μg/mL)	August 1996 Liquids Analytical Mean (μg/mL)
Al	28.6	132	43.4
Bi	<4.10	<10.1	<4.96
Ca	<4.46	56.75	<11.9
Cl	243	252.3	245
TIC as CO_3	1,530	2,130	1,620
Cr	1.20	7.63	2.12
F	311	1,500	481
Fe	<2.05	<20.0	<4.61

Table D3-3. Tank 241-AW-105 Liquid Concentrations. (2 sheets)

Component	August 1996 Supernatant Analytical Mean (μg/mL)	August 1996 Interstitial Liquid Sample 5AW-96-5 (μg/mL)	August 1996 Liquids Analytical Mean (μg/mL)
K	1,630	4,150	1,990
La	<2.05	<5.05	<2.48
Mn	<0.410	<1.26	<0.531
Na	13,800	21,200	14,900
Ni	<0.820	<2.02	<0.991
NO_2	1,240	1,520	1,280
NO_3	25,900	33,700	27,000
Pb	<4.10	<10.1	<4.96
PO_4	<194	<133	<185
Si	45.3	104	53.7
SO_4	284	405.2	301
Sr	<0.410	<1.01	<0.496
TOC	2,380	704	2,140
U_{TOTAL}	<20.5	270.4	<56.2
Zr	<0.410	7.045	<1.36
Density (g/mL)	1.02	1.04	1.02
Radionuclides (μCi/mL)			
Total alpha	<9.30E-05	0.00394	<6.43E-04
^{60}Co	2.62E-04	0.00209	5.23E-04
$^{89/90}Sr$	0.0189	0.195	0.0440
^{137}Cs	1.42	6.56	2.15
$^{239/240}Pu$	<4.12E-06	0.00109	<1.59E-04
^{241}Am	<6.31E-06	<7.10E-05	<1.56E-05

D3.5 ESTIMATED COMPONENT INVENTORIES

The core samples taken in May 1997 provide the best basis for the sludge in tank 241-AW-105. Where available, concentrations for analytes taken from the May 1997 data were used for the best-basis inventory. For analytes reported in the 1986 or 1990 core sample data but not in the 1997 data set, the 1986 and 1990 core sample results were used. The 1990 values should be viewed with caution because the results do not compare well with the 1997 and 1986 data in many cases. Table D3-4 shows the best-basis sludge inventories for tank 241-AW-105. A sludge volume of 965 kL (255 kgal) and a density of 1.31 g/mL was used to generate the inventories.

The grab samples taken in August 1996 provide the best basis for the liquid in tank 241-AW-105. Since August 1996, no significant transfers into or out of the tank have been made. For the best-basis inventories in Table D3-4, means from the supernatant samples and interstitial liquid sample 5AW-96-5 were calculated. Interstitial liquid sample 5AW-96-5 was taken very close to the interface between the supernatant and the sludge layers. A supernatant volume of 678 kL (179 kgal) was used to generate the inventories.

Table D3-4. Inventory Estimates for Tank 241-AW-105. (2 sheets)

Component	Sample Based Solids Inventory[1] (kg)	Sample Based Liquids Inventory[2] (kg)	Sample Based Total Inventory (kg)
Al	3,540	29.4	3,570
Bi	<2,550	<3.36	<2,550
Ca	<3,130	<8.09	<3,140
Cl	457	166	623
TIC as CO_3	9,320	1,100	10,400
Cr	<1,490	1.43	<1,490
F	62,600	326	62,900
Fe	<4,740	<3.13	<4,740
K	n/r	1,350	1,350
La	<1,370	<1.68	<1,370
Mn	<2,810	<0.360	<2,810
Na	129,000	10,100	139,000
Ni	n/r	<0.672	<0.672
NO_2	9,010	868	9,880
NO_3	32,200	18,300	50,500
Pb	<2,560	<3.36	<2,560
PO_4	<2,710	<125	<2,840
Si	2,560	36.4	2,600
SO_4	2,670	204	2,870

Table D3-4. Inventory Estimates for Tank 241-AW-105. (2 sheets)

Component	Sample Based Solids Inventory[1] (kg)	Sample Based Liquids Inventory[2] (kg)	Sample Based Total Inventory (kg)
Sr	<255	<0.336	<255
TOC	6,430	1,450	7,880
U_{TOTAL}	40,500	<38.1	40,500
Zr	82,900	<0.921	82,900
^{60}Co (Ci)[3]	220	0.505	221
^{90}Sr (Ci)[3]	80,000	31.9	80,000
^{137}Cs (Ci)[3]	44,200	1,550	45,800
$^{239/240}$Pu (Ci)[3]	1,360	<0.108	1,360
^{241}Am (Ci)[3]	652	<0.0105	652

Notes:

[1]Based on the mean sample concentrations from Table B3-7 with a volume of 965 kL (255 kgal) and a density of 1.31 g/mL

[2]Based on the mean sample concentrations from Table D3-3 with a volume of 678 kL (179 kgal)

[3]Radionuclides are decayed to January 1, 1994.

D4.0 DEFINE THE BEST-BASIS AND ESTABLISH COMPONENT INVENTORIES

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair 1996). As part of this effort, an evaluation of chemical information for tank 241-AW-105 was performed, and a best-basis inventory was established. This work, detailed in the following sections, follows the methodology that was established by the standard inventory task. The following information was used in the evaluation:

- Analytical data from the 1997 push mode core sampling event, the 1996 grab sampling event, the 1990 push mode core sampling event, and a 1986 push mode core sampling event (see Appendix B).

- Inventory estimates generated for this tank from the HDW model (Agnew et al. 1997).

Based on this engineering assessment, a best-basis inventory was developed for tank 241-AW-105 using the 1997 core sampling and 1996 grab sampling analytical data. Where analytical data were not available, the HDW model inventory estimates reported by Agnew et al. (1997) were used as the best basis for this tank.

Best-basis tank inventory values are derived for 46 key radionuclides, as defined in Section 3.1 of Kupfer et al. (1997), all decayed to a common report date of January 1, 1994. Often, waste sample analyses have only reported ^{90}Sr, ^{137}Cs, $^{239/240}$Pu, and total uranium, or total beta and total alpha, while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129}I, ^{154}Eu, ^{155}Eu, and ^{241}Am have been infrequently reported. For this reason, it has been necessary to derive most of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track the radionuclides' movement with tank waste transactions. These computer models are described in Section 6.1 of Kupfer et al. (1997) and in Watrous and Wootan (1997.)

Model-generated values for radionuclides in any of the 177 Hanford Site tanks are reported in the HDW Rev. 4 model results (Agnew et al. 1997). The best-basis value for any one analyte may be either a model result or a sample- or engineering assessment-based result, if available.

The best-basis inventory estimate for tank 241-AW-105 is presented in Tables D4-1 and D4-2. Mercury values were specified in Simpson (1998). Once the best-basis inventories were determined, the hydroxide inventory was calculated by performing a charge balance with the valence of other analytes. This charge balance approach is consistent with that used by Agnew et al. (1997).

The inventory values reported in Tables D4-1 and D4-2 are subject to change. Refer to the Tank Characterization Database (LMHC 1998) for the most current inventory values.

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AW-105 (Effective April 30, 1998). (2 sheets)

Analyte	Total Inventory (kg)[1]	Basis (S, M, E, or C)[2]	Comment
Al	3,570	S	
Bi	0	E	The waste types in the tank are not expected to contain bismuth.
Ca	1,285	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
Cl	623	S	
TIC as CO_3	10,400	S	
Cr	1,730	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
F	62,900	S	
Fe	4,100	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
Hg	0	E	Coating waste did not contain mercury after 1969. (Simpson 1998)
K	10,600	S	Based on the September 1986 sludge concentrations and the August 1996 supernatant concentrations
La	362	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
Mn	2,870	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
Na	139,000	S	
Ni	305	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
NO_2	9,880	S	
NO_3	50,500	S	
OH_{TOTAL}	115,000	C	
Pb	441	S	Based on the May 1990 sludge concentrations (ρ = 1.42)
PO_4	1,990	S	Based on the May 1990 sludge concentrations (ρ = 1.42)
Si	2,600	S	
SO_4	2,870	S	

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in Tank 241-AW-105 (Effective April 30, 1998). (2 sheets)

Analyte	Total Inventory (kg)[1]	Basis (S, M, E, or C)[2]	Comment
Sr	16.8	S	Based on the September 1986 sludge concentrations (ρ = 1.32)
TOC	7,880	S	
U_{TOTAL}	40,500	S	(Phosphorescence = 23,200)
Zr	82,900	S	

Notes:

[1]Sample-based inventory estimates are based on a sludge volume of 965 kL (255 kgal) and a supernatant volume of 678 kL (179 kgal).

[2]S = sample-based (see Appendix B), M = HDW model-based (Agnew et al. 1997), E = engineering assessment-based, C = calculated by charge balance; includes oxides as hydroxides, not including CO_3, NO_2, NO_3, PO_4, SO_4, and SiO_3.

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{3}H	12.4	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{14}C	2.05	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{59}Ni	1.08	M	
^{60}Co	221	S	
^{63}Ni	109	M	
^{79}Se	2.28	M	
^{90}Sr	80,000	S	
^{90}Y	80,000	S/E	Based on ^{90}Sr
^{93}Zr	10.9	M	
^{93m}Nb	8.01	M	
^{99}Tc	98.5	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{106}Ru	421	M	
^{113m}Cd	53.6	M	
^{125}Sb	1,580	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{126}Sn	3.51	M	
^{129}I	3.42	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{134}Cs	93.7	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{137}Cs	45,800	S	
^{137m}Ba	43,300	S/E	Based on 0.946 of ^{137}Cs activity
^{151}Sm	8,110	M	
^{152}Eu	3.56	M	
^{154}Eu	4,750	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{155}Eu	2,800	S	Based on the May 1990 sludge sample results (ρ = 1.42)
^{226}Ra	1.01E-04	M	

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{227}Ac	6.23E-04	M	
^{228}Ra	0.147	M	
^{229}Th	0.00340	M	
^{231}Pa	0.00244	M	
^{232}Th	0.0144	M	
^{232}U	1.50	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.857)
^{233}U	5.72	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 3.27)
^{234}U	19.4	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 11.1)
^{235}U	0.738	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.423)
^{236}U	1.55	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 0.887)
^{237}Np	0.439	M	
^{238}Pu	85.3	S	Based on the September 1986 sludge sample results (ρ = 1.32)
^{238}U	13.5	S/M	Based on ICP U sample results ratioed to HDW estimates for U isotopes (Phosphorescence = 7.73)
^{239}Pu	1,050	S/M	Based on $^{239/240}Pu$ sample results using HDW isotopic ratios
^{240}Pu	315	S/M	Based on $^{239/240}Pu$ sample results using HDW isotopic ratios
^{241}Am	652	S	
^{241}Pu	12,900	S/M	Based on ^{239}Pu sample results using HDW isotopic ratios

Table D4-2. Best-Basis Inventory Estimates for Radioactive Components in Tank 241-AW-105 Decayed to January 1, 1994 (Effective April 30, 1998). (3 sheets)

Analyte	Total Inventory (Ci)[1]	Basis (S, M, or E)[2]	Comment
^{242}Cm	1.25	S/M	Based on ^{241}Am sample results using HDW isotopic ratios
^{242}Pu	0.0483	S/M	Based on ^{239}Pu sample results using HDW isotopic ratios
^{243}Am	0.0859	S/M	Based on ^{241}Am sample result using HDW isotopic ratios
^{243}Cm	10.2	S/E	4% of $^{243/244}Cm$ consists of ^{243}Cm (Based on 1990 sludge sample results)
^{244}Cm	246	S/E	96% of $^{243/244}Cm$ consists of ^{244}Cm (Based on 1990 sludge sample results)

Notes:

[1]Sample-based inventory estimates are based on a sludge volume of 965 kL (255 kgal) and a supernatant volume of 678 kL (179 kgal).

[2]S = sample-based (see Appendix B), M = HDW model-based (Agnew et al. 1997), E = engineering assessment-based.

D5.0 APPENDIX D REFERENCES

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APPENDIX E

BIBLIOGRAPHY FOR TANK 241-AW-105

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APPENDIX E

BIBLIOGRAPHY FOR TANK 241-AW-105

Appendix E is a bibliography that supports the characterization of tank 241-AW-105. This bibliography represents an in-depth literature search of all known information sources that provide sampling, analysis, surveillance, modeling information, and processing occurrences associated with tank 241-AW-105 and its respective waste types.

The references in this bibliography are separated into three categories containing references broken down into subgroups. These categories and their subgroups are listed below.

I. NON-ANALYTICAL DATA

- Ia. Models/Waste Type Inventories/Campaign Information
- Ib. Fill History/Waste Transfer Records
- Ic. Surveillance/Tank Configuration
- Id. Sample Planning/Tank Prioritization
- Ie. Data Quality Objectives/Customers of Characterization Data

II. ANALYTICAL DATA - SAMPLING OF TANK WASTE AND WASTE TYPES

- IIa. Sampling of Tank 241-AW-105
- IIb. Sampling of Similar Waste Types

III. COMBINED ANALYTICAL/NON-ANALYTICAL DATA

- IIIa. Inventories from Campaign and Analytical Information
- IIIb. Compendium of Existing Physical and Chemical Documented Data Sources

The bibliography is broken down into the appropriate sections of material with an annotation at the end of each reference describing the information source. Most information listed below is available in the Lockheed Martin Hanford Corporation Tank Characterization and Safety Resource Center.

I. NON-ANALYTICAL DATA

Ia. Models/Waste Type Inventories/Campaign Information

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Contains waste type summaries and primary chemical compound/analyte and radionuclide estimates for sludge, supernatant, and solids.

Anderson, J. D., 1990, *A History of the 200 Area Tank Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

- Contains single-shell tank fill history and primary campaign and waste information to 1981.

Bergmann, D. W., 1988, *Segregation of Decladding Solution from PUREX Cladding Removal Waste*, (internal memorandum 12730-88-175 to E. J. Kosiancic, December 8), Westinghouse Hanford Company, Richland, Washington.

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Ib. Fill History/Waste Transfer Records

Agnew, S. F., R. A. Corbin, T. B. Duran, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Waste Status and Transaction Record Summary (WSTRS) Rev. 4*, LA-UR-97-311, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Contains spreadsheets showing all available data on tank additions and transfers.

Anderson, J. D., 1990, *A History of the 200 Area Tank Farms*, WHC-MR-0132, Westinghouse Hanford Company, Richland, Washington.

- Contains single-shell tank fill history and primary campaign and waste information to 1981.

Koreski, G. M., 1997, *Double-Shell Tank Inventory and Material Balance Report for April 1998* (internal letter 7A140-98-024 to Distribution), Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains tank transfer data and tank inventory information for all double-shell tanks.

Koreski, G. M., 1997, *Operational Waste Volume Projection Historical Database*, In: Excel/SQL. Available: Tank Waste Information System 2 (TWINS2), Lockheed Martin Hanford Corporation, Richland, Washington.

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Ic. Surveillance/Tank Configuration

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- Presents compatibility assessment results in preparation for transferring tank 241-AW-105 supernatant to tank 241-AP-108 in preparation for 242-A Evaporator Campaign 95-1.

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- Provides basis for selecting tanks for disposal needs.

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II. ANALYTICAL DATA - SAMPLING OF TANK WASTE AND WASTE TYPES

IIa. Sampling of Tank 241-AW-105

DiLiberto, A. J., 1990, *105-AW Core Sample*, (internal letter 9054755 to B. P. McGrail, July 2), Westinghouse Hanford Company, Richland, Washington.

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- Contains information on CWZr2 waste type.

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- Reports analytical results of the core samples removed from tank 241-AW-103 in May 1997.

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- Contains results of the analysis of a core sample of NCRW solids obtained from tank 241-AW-103 in 1989.

Weiss, R. L., 1990, *January 1989 Core Sample From Tank 241-AW-103 Process Chemistry Laboratories Efforts*, (internal letter 12712-PCL90-039 to A. J. DiLiberto, February 22), Westinghouse Hanford Company, Richland, Washington.

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III. COMBINED ANALYTICAL/NON-ANALYTICAL DATA

IIIa. Inventories from Campaign and Analytical Information

Agnew, S. F., J. Boyer, R. A. Corbin, T. B. Duran, J. R. Fitzpatrick, K. A. Jurgensen, T. P. Ortiz, and B. L. Young, 1997, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*, LA-UR-96-3860, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Contains waste type summaries and primary chemical compound/analyte and radionuclide estimates for sludge, supernatant, and solids.

Brevick, C. H., J. L. Stroup, and J. W. Funk, 1997, *Historical Tank Content Estimate for the Southwest Quadrant of the Hanford 200 Areas*, WHC-SD-WM-ER-350, Rev. 1, Fluor Daniel Northwest, Inc. for Fluor Daniel Hanford Inc., Richland, Washington.

- Contains summary information from the supporting document as well as in-tank photographs collages and the historical inventory estimates.

Kupfer, M. J., A. L. Boldt, B. A. Higley, K. M. Hodgson, L. W. Shelton, B. C. Simpson, and R. A. Watrous, M. D. LeClair, G. L. Borsheim, R. T. Winward, R. M. Orme, N. G. Colton, S. L. Lambert, D. E. Place, and W. W. Schulz, 1997, *Standard Inventories of Chemicals and Radionuclides in Hanford Site Tank Wastes*, HNF-SD-WM-TI-740, Rev. 0A, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains a global component inventory for 200 Area waste tanks. Fourteen chemical and two radionuclide components are currently inventoried.

Schmittroth, F. A., 1995, *Inventories for Low-Level Tank Waste*, WHC-SD-WM-RPT-164, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains a global inventory based on process knowledge and radioactive decay estimations using ORIGEN2. Plutonium and uranium waste contributions are taken at one percent of the amount used in processes. Also compares information on technetium-99 from ORIGEN2 and analytical data.

Schofield, J. S., 1991, *Estimation of Neutralized Current Acid Waste and Neutralized Cladding Removal Waste Constituents*, (internal letter 85440-91-018 to S. A. Barker, July 18), Westinghouse Hanford Company, Richland, Washington.

- Provides an estimate of tank contents for tanks containing neutralized current acid waste and neutralized cladding removal waste based on a reconciliation of flowsheet records, process tests, and January 1996 and July 1986 tank sampling events.

IIIb. Compendium of Data from Other Physical and Chemical Sources

Agnew, S. F., and J. G. Watkin, 1994, *Estimation of Limiting Solubilities for Ionic Species in Hanford Waste Tank Supernates*, LA-UR-94-3590, Los Alamos National Laboratory, Los Alamos, New Mexico.

- Gives solubility ranges used for key chemical and radionuclide components based on supernatant sample analyses.

Barker, S. A., 1990, *Neutralized Cladding Removal Waste Pretreatment Conceptual Flowsheet*, WHC-SD-WM-TI-444, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains pretreatment flowsheet for NCRW waste.

Brevick, C. H., J. L. Stroup, and J. W. Funk, 1997, *Supporting Document for the Historical Tank Content Estimate for AW-Tank Farm*, HNF-SD-WM-ER-316, Rev. 1, Fluor Daniel Northwest, Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains summary tank farm and tank write-ups on historical data, and solid inventory estimates and appendixes for the data.

Brevick, C. H., L. A. Gaddis, and W. W. Pickett, 1996, *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 Areas*, WHC-SD-WM-ER-350, Rev. 0A, ICF Kaiser Hanford Company, Richland, Washington.

- Contains summary information from the supporting documents for tanks in AW, AN, AP, AY, AZ, and SY farms, including in-tank photographic collages and tank inventory estimates.

De Lorenzo, D. S., J. H. Rutherford, D. J. Smith, D. B. Hiller, K. W. Johnson, and B. C. Simpson, 1994, *Tank Characterization Reference Guide*, WHC-SD-WM-TI-648, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Summarizes issues surrounding the characterization of nuclear wastes stored in Hanford Site waste tanks.

Hanlon, B. M., 1998, *Waste Tank Summary Report for Month Ending April 30, 1998*, WHC-EP-0182-121, Lockheed Martin Hanford Corp. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Contains a monthly summary of the following: fill volumes, Watch List tanks, occurrences, integrity information, equipment readings, equipment status, tank location, and other miscellaneous tank information.

Husa, E. I., R. E. Raymond, R. K. Welty, S. M. Griffith, B. M. Hanlon, R. R. Rios, and N. J. Vermeulen, 1993, *Hanford Site Waste Storage Tank Information Notebook*, WHC-EP-0625, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

- Contains in-tank photographs and summaries of the tank description, leak detection system, and tank status.

LMHC, 1998, Tank Characterization Data Base, Internet at http://twins.pnl.gov:8001/TCD/main.html, Lockheed Martin Hanford Corp., Richland, Washington.

- Contains analytical data for each of the 177 Hanford Site waste tanks.

Lodwick, R. J., 1997, *Technical Review of Criticality Safety of Disposing of K Basin Sludge in Double-Shell Tank AW-105*, (internal letter DESH-9750785 to J. L. Wise, January 29), DE&S Hanford Inc. for Fluor Daniel Hanford, Inc., Richland, Washington.

- Authorizes Fluor Daniel Northwest, Inc. to provide support and technical review for this report regarding disposal of K Basin sludge into tank 241-AW-105.

Shelton, L. W., 1996, *Chemical and Radionuclide Inventory for Single- and Double-Shell Tanks*, (internal memorandum 74A20-96-30 to D. J. Washenfelder, February 28), Westinghouse Hanford Company, Richland, Washington.

- Contains an tank inventory estimate based on analytical information.

Shelton, L. W., 1995, *Chemical and Radionuclide Inventory for Single and Double Shell Tanks*, (internal memorandum 75520-95-007, to R. M. Orme, August 8), Westinghouse Hanford Company, Richland, Washington.

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Shelton, L. W., 1995, *Radionuclide Inventories for Single and Double Shell Tanks*, (internal memorandum to F. M. Cooney, 71320-95-002, February 14), Westinghouse Hanford Company, Richland, Washington.

- Contains a tank inventory estimate based on analytical information.

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