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Tank Characterization Report for Single-Shell Tank 241-S-101

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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-S-101. This report supports the requirements of Tri-Party Agreement Milestone M-44-09.

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Tank Characterization Report for Single-Shell Tank 241-S-101

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EXECUTIVE SUMMARY

This characterization report summarizes information on the historical uses, current status, and sampling and analysis results of waste stored in single-shell tank 241-S-101. This report supports requirements of *Hanford Federal Facility Agreement and Consent Order* Milestone M-44-09 (Ecology et al. 1996).

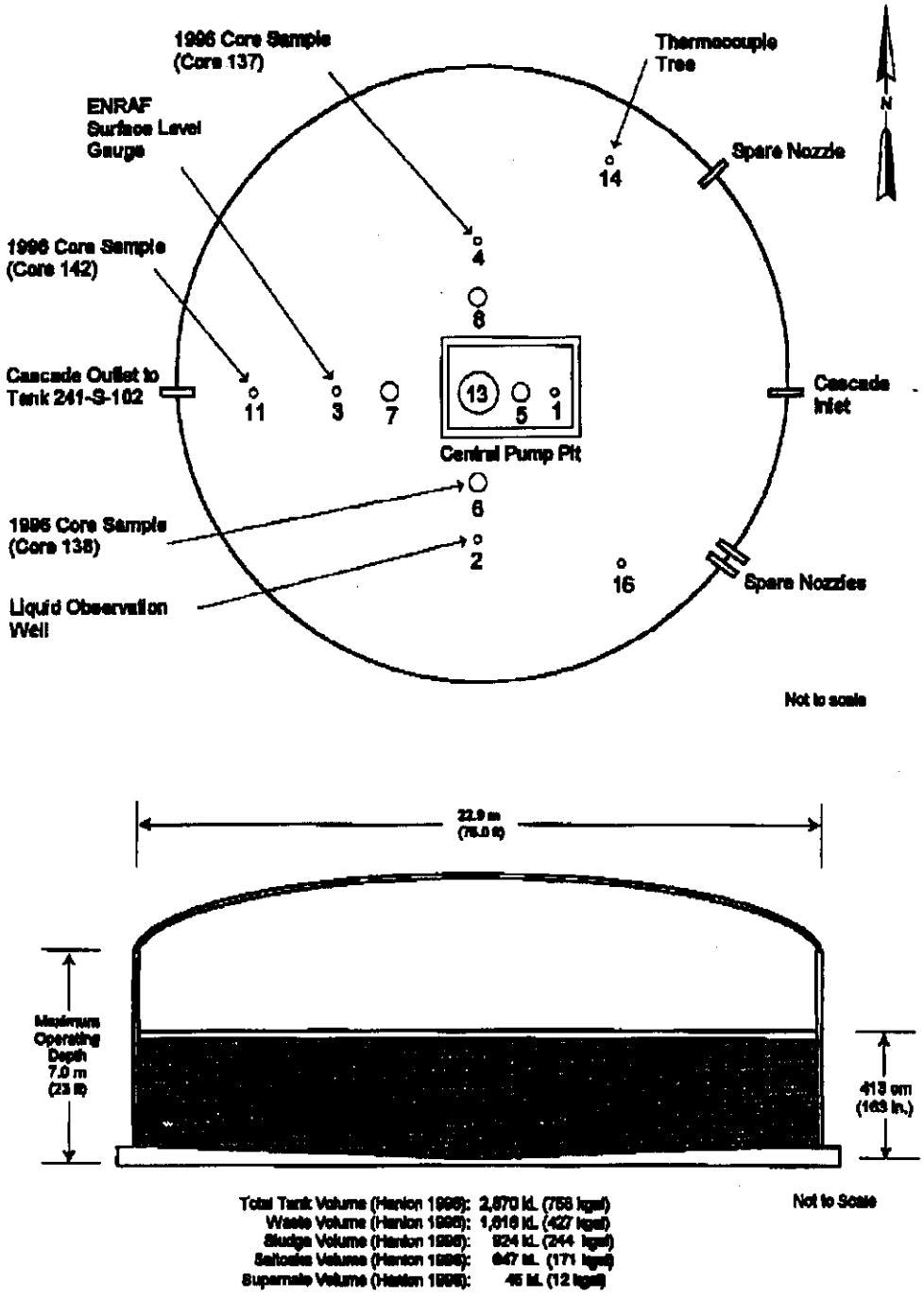
Tank 241-S-101 is located in the Hanford Site 200 West Area S Tank Farm. The tank went into service in the third quarter of 1953, when it received high-level reduction-oxidation (REDOX) waste. The tank continued to receive REDOX waste until 1955, and did not receive waste again until 1973. The tank received many different waste types from numerous tanks in the S, SX and U tank farms between 1973 and 1980. Throughout its service life, the tank has received the following waste types: REDOX, N Reactor, Pacific Northwest Laboratories (PNL), decontamination, cladding, evaporator bottoms, ion exchange, evaporator, and supernatant. The tank was removed from service in 1980, and was partially interim isolated in December 1982.

The tank has an operating capacity of 2,870 kL (758 kgal), and presently contains an estimated 1,620 kL (427 kgal) of waste. The total amount is estimated to be composed of 45 kL (12 kgal) of supernatant, 924 kL (244 kgal) of sludge, and 647 kL (171 kgal) of saltcake.

Table ES-1. Description and Status of Tank 241-S-101.

TANK DESCRIPTION	
Type	Single-shell
Constructed	1950-1951
In-service	1953
Diameter	22.9 m (75.0 ft)
Operating depth	7.0 m (23 ft)
Capacity	2,870 kL (758 kgal)
Bottom shape	Dish
Ventilation	Passive
TANK STATUS	
Waste classification	Non-complexed
Total waste volume	1,620 kL (427 kgal)
Supernatant volume	45 kL (12 kgal)
Sludge volume	924 kL (244 kgal)
Saltcake volume	647 kL (171 kgal)
Waste surface level (1981 - 1996)	4.08 m (160.8 in.) to 4.12 m (162.4 in.)
Temperature (1/88 - 6/96)	28.2 °C (82.8 °F) to 58.2 °C (136.8 °F)
Integrity	Sound
Watch List	None
SAMPLING DATES	
Core samples	March/April 1996
SERVICE STATUS	
Out of service	1980
Partially isolated	December 1982

Figure ES-1. Profile of Tank 241-S-101.



Tank 241-S-101 was sampled in March/April 1996 to satisfy the requirements of *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995), and *Strategy for Sampling Hanford Site Tank Wastes for Development of Disposal Technology* (Kupfer et al. 1995). This sampling effort involved taking push-mode core samples of the tank waste from three different risers. The sampling and analyses were performed in accordance with *Tank 241-S-101 Push Mode Core Sampling and Analysis Plan* (Kruger 1996). All analyses on samples from core 138 and core 142 were performed at the Westinghouse Hanford Company (WHC) 222-S Laboratory. Samples from core 137 were composited and a subsample sent to the Pretreatment Program to fulfill the sampling and analysis plan (SAP) requirements.

The purpose of the safety screening data quality objective (DQO) is to identify any unknown safety issues and to evaluate the tank for placement on or removal from a Watch List. To accomplish this, the safety screening DQO requires a measurement of the total fuel content/energetics of the waste by differential scanning calorimetry (DSC), weight percent water by thermogravimetric analysis (TGA), bulk density of solids or specific gravity (SpG) of liquids, and total alpha activity by alpha proportional counting. The safety screening DQO also requires a determination of the flammability of the tank headspace gases. To satisfy this requirement, the flammability of the tank headspace was measured as a percentage of the lower flammability limit (LFL) using a combustible gas meter. The historical DQO required the analysis of metals by inductively coupled plasma spectroscopy

(ICP), anions by ion chromatography (IC), total organic carbon (TOC), and selected radionuclides. The SAP also required analyses for lithium and bromide to check for contamination of the samples by the wash water used during sampling operations.

The historical DQO, through selective tank sampling, attempts to evaluate the waste composition predictions made by the Hanford Defined Waste (HDW) model, the Tank Layer Model (TLM), and the Historical Tank Content Estimate (HTCE). No specific single waste type could be isolated from tank 241-S-101 due to the spatially complex nature of the tank waste (Simpson and McCain 1995). Composite samples were formed from all segments in the core sample for each riser, and the analytical results were compared to the HTCE predictions. Comparison indicated that the measured values were at least one-tenth of the expected values, meeting the DQO requirements.

All analyses performed on the waste in tank 241-S-101 exhibited results well within the limits imposed by the safety screening DQO. The safety screening decision threshold for total alpha activity is 1 g/L, which normalizes to 34.2 μCi/g for the solids using the highest density of 1.80 g/mL, and 61.5 μCi/mL for the liquids. The calculated overall mean for the solids portion of the tank was 0.358 μCi/g, while the overall mean for the liquid portion was < 0.00810 μCi/mL. All results were below the decision threshold, with the largest of the upper limit one-sided 95 percent confidence interval on the mean being 2.00 μCi/g. The safety screening DQO has established a decision threshold of an enthalpy change of -480 J/g (dry weight basis) for the DSC analyses; for comparison to this limit, all analytical results were first converted to a dry weight basis. All exothermic results were below the decision

below the decision threshold, with the largest upper limit one-sided 95 percent confidence interval on the mean upper limit being -226 J/g. The weight percent water results were 40.2 percent for the solids and 53.1 percent for the liquids, as measured by TGA.

Core composites were analyzed for TOC to satisfy the historical DQO. Results were compared with the safety screening decision threshold of 30,000 μg C/g (dry weight basis) for information purposes. The overall mean TOC result for the core composites was 3,390 μg C/g (wet), while the highest upper limit one-sided 95 percent confidence interval on the mean upper limit was 5,720 μg C/g (wet).

The flammability of the gas in the tank headspace is an additional safety screening DQO consideration. The notification limit for flammable gas concentration is 25 percent of the LFL. The highest combustible gas meter reading was 7 percent of the LFL. Additional measurements were taken for ammonia (600 ppm), oxygen (20.8 percent), and total organic vapor (31 ppm).

Another factor in assessing tank safety is the heat generation and temperature of the waste. Heat is generated in the tanks from radioactive decay. The total tank heat load estimate from radionuclide data was 5,970 W (20,400 Btu/hr). The HTCE prediction was 5,010 W (17,100 Btu/hr) (Agnew et al. 1996a), while an estimate based on the tank headspace temperature was 4,020 W (13,700 Btu/hr) (Kummerer 1994). The estimates are in reasonable agreement and are well below the 11,700 W (40,000 Btu/hr) operating

specification limit for single-shell tanks (Bergmann 1991). Because an upper temperature limit has been exhibited (Section 2.4.3), it may be concluded that any heat generated from radioactive sources throughout the year is dissipated.

Based upon the decision criteria of the safety screening DQO, this tank may be categorized as "safe." The waste in tank 241-S-101 may continue to be safely stored in the tank without special action. In addition, there were no unexpected findings that could affect the ability to retrieve and dispose of the waste safely.

Table ES-2 presents the results for major analytes and analytes of concern.

Table ES-2. Major Analytes and Analytes of Concern. (2 sheets)

Analyte	Mean Solid Concentration	Solid RSD (Mean)	Mean Supernatant Concentration	Supernatant RSD (Mean)	Total Inventory
METALS	**µg/g**	**%**	**µg/mL**	**%**	**kg**
Aluminum	80,500	14.7	24,500	2.9	2.10E+05
Chromium	7,250	20.5	813	1.3	18,800
Iron	1,360	8.2	< 20.1	N/A	3,530
Manganese	1,540	17.8	< 4.01	N/A	3,990
Phosphorous	1,400[1]	24.5	1,260	7.7	3,690
Potassium	926[1]	10.2	2,360	6.5	2,510
Sodium	1.49E+05	4.8	2.15E+05	0.7	3.96E+05
Sulfur	1,960[1]	50.9	1,860	5.1	5,160
Uranium	4,680[1]	23.9	< 200	N/A	12,100
ANIONS	**µg/g**	**%**	**µg/mL**	**%**	**kg**
Chloride	3,460	9.5	7,450	1.3	9,310
Nitrate	1.62E+05	25.1	1.81E+05	1.7	4.28E+05
Nitrite	49,200	8.4	94,000	1.0	1.32E+05
Oxalate	5,700	44.7	< 858	N/A	14,800
Phosphate	3,680	56.3	3,600	6.1	9,700
Sulfate	7,250	46.1	5,650	4.6	19,100
RADIO-NUCLIDES	**µCi/g**	**%**	**µCi/mL**	**%**	**Ci**
Total alpha	0.358	24.0	< 0.00810	N/A	949
^{137}Cs	131	10.3	---	---	3.40E+05
^{90}Sr	252[2]	19.6	---	---	6.53E+05

Table ES-2. Major Analytes and Analytes of Concern. (2 sheets)

Analyte	Mean Solid Concentration	Solid RSD (Mean)	Mean Supernatant Concentration	Supernatant RSD (Mean)	Total Inventory
TOTAL CARBON	**µg C/g**	**%**	**µg C/mL**	**%**	**kg**
Total inorganic carbon	3,760[2]	58.3	---	---	5,160
Total organic carbon	1,990[2]	57.3	---	---	9,750
PHYSICAL PROPERTIES	**Solid Mean**	**%**	**Supernatant Mean**	**%**	**kg**
Weight percent water	40.2 %	3.5	53.1 %	1.0	1.07E+06
Density	1.65 g/mL	2.0	1.36 g/mL	0.7	---

Note:

N/A = not applicable
RSD = relative standard deviation
--- = not analyzed

[1]The results are from samples prepared by acid digestion, while all other metal results are from the fusion digestion data. Any one particular method was not chosen exclusively, this, so as to provide the most conservative estimate.

[2]Mean is reported from core composite results.

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LIST OF TERMS

ANOVA	analysis of variance
Btu/hr	British thermal units per hour
Ci	curies
Ci/L	curies per liter
cm	centimeter
CWR1	REDOX cladding waste, 1952-60
DBP	dibutyl phosphate
dil.	dilution
DL	drainable liquid
DQO	data quality objective
DSC	differential scanning calorimetry
ft	feet
g	grams
GEA	gamma energy analysis
g/L	grams per liter
g/gal	grams per gallon
g/mL	grams per milliliter
HDW	Hanford Defined Waste
HTCE	Historical Tank Content Estimate
in.	inches
IC	ion chromatography
ICP	inductively coupled plasma spectroscopy
J/g	joules per gram
kg	kilograms
kgal	kilogallons
kL	kiloliters
LEL	lower explosive limit
LFL	lower flammability limit
LL	liner liquid
M	moles per liter
m	meter
mL	milliliters
mg	milligram
mm	millimeter
mR/hr	milliroentgens per hour
NFPA	National Fire Protection Association
PNL	Pacific Northwest Laboratories

LIST OF TERMS

ppm	parts per million
QC	quality control
R1	REDOX waste, 1952-57
REDOX	reduction-oxidation
RPD	relative percent difference
RSD	relative standard deviation
RSltCk	saltcake from S and SX tank farms
SACS	Surveillance Analysis Computer System
SAP	sampling and analysis plan
SMMS1	Supernatant Mixing Model S1 Saltcake, 242-S campaign, 1973-76
SMMS2	Supernatant Mixing Model S2 Saltslurry, 242-S campaign, 1977-80
SpG	specific gravity
TGA	thermogravimetric analysis
TLM	Tank Layer Model
TIC	total inorganic carbon
TOC	total organic carbon
W	watts
WHC	Westinghouse Hanford Company
WSTRS	Waste Status and Transaction Record Summary
wt%	weight percent
°C	degrees Celsius
°F	degrees Fahrenheit
ΔH	change in enthalpy
μCi/gal	microcuries per gallon
μCi/g	microcuries per gram
μCi/mL	microcuries per milliliter
μeq/g	microequivalents per gram
μg C/g	micrograms carbon per gram
μg C/mL	micrograms carbon per milliliter
μg/g	micrograms per gram
μg/mL	micrograms per milliliter

1.0 INTRODUCTION

This tank characterization report presents an overview of single-shell tank 241-S-101 and its waste contents. It provides estimated concentrations and inventories for the waste constituents based on the latest sampling and analysis activities, in combination with background tank information. Tank 241-S-101 was core sampled in March and April 1996 in accordance with *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995), and *Strategy for Sampling Hanford Site Tank Wastes for Development of Disposal Technology* (Kupfer et al. 1995). The requirements set forth in these documents are integrated in the sampling and analysis plan (SAP) (Kruger 1996).

Tank 241-S-101 is out of service, as are all single-shell tanks, is categorized as sound, and has been partially interim isolated. The concentration and inventory values reported in this document reflect the best composition estimates of the waste based on the available analytical data and historical models. This report supports the requirements of *Hanford Federal Facility Agreement and Consent Order* Milestone M-44-09 (Ecology et al. 1996).

1.1 PURPOSE

The purpose of this report is to summarize the information about the use and contents of tank 241-S-101. When possible, this information will be used to assess issues associated with safety, operational, environmental, and process development activities. This report also serves as a reference point for more detailed information about tank 241-S-101.

1.2 SCOPE

The March and April 1996 core sampling event was guided by the requirements of two data quality objectives (DQOs): the safety screening DQO (Dukelow et al. 1995) and the historical DQO (Simpson and McCain 1995). The purpose of the safety screening DQO is to identify any unknown safety issues and to evaluate the tank for placement on or removal from a Watch List. The historical DQO, through selective tank sampling, attempts to evaluate the waste composition predictions made by the Hanford Defined Waste (HDW) model, the Tank Layer Model (TLM), and the Historical Tank Content Estimate (HTCE). A core composite sample was sent to the Pretreatment Program to fulfill the requirements in Kupfer et al. (1995) and the SAP.

All analyses were performed on the core samples as directed in the SAP (Kruger 1996). These analyses were: differential scanning calorimetry (DSC) to evaluate fuel level and energetics; thermogravimetric analysis (TGA) to determine moisture content; total alpha activity analysis to evaluate criticality potential; bulk density/specific gravity; metals by inductively coupled plasma (ICP); anions by IC; total organic carbon (TOC) by hot persulfate oxidation; gamma energy analysis for ^{137}Cs; total beta and $^{89/90}Sr$ by beta counting; and total uranium by laser phosphorescence. Combustible gas meter readings of the tank headspace vapors were also taken, as required by the safety screening DQO, to address flammability concerns.

2.0 HISTORICAL TANK INFORMATION

This section describes tank 241-S-101 based on historical information. The first part details the current condition of the tank. The next part contains discussions of the tank's design, transfer history, and process sources that contributed to the tank waste, including an estimate of the current contents based on the process history. Events that may be related to tank safety issues, such as potentially hazardous tank contents or off-normal operating temperatures, are included. The final part summarizes available surveillance data for the tank. Solid and liquid level data are used to determine tank integrity (leaks) and to provide clues to internal activity in the solid layers of the tank. Temperature data are provided to evaluate the heat-generating characteristics of the waste.

2.1 TANK STATUS

As of May 1996, tank 241-S-101 contained an estimated 1,620 kL (427 kgal) of waste classified as non-complexed (Hanlon 1996). Liquid waste volume is estimated using an ENRAF[1] surface level gauge. Solid waste volume is estimated using a sludge measurement device and a photographic evaluation. The solids volume was last updated on September 16, 1980. The amounts of various waste phases in the tank are presented in Table 2-1.

Table 2-1. Estimated Tank Contents.[1]

Waste Form	Estimated Volume	
	kL	kgal
Total Waste	1,620	427
Supernatant Liquid	45	12
Sludge	924	244
Saltcake	647	171
Drainable Interstitial Liquid	318	84
Drainable Liquid Remaining	363	96
Pumpable Liquid Remaining	341	90

Note:
[1]Hanlon (1996)

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

Tank 241-S-101 is categorized as sound. The tank was removed from service in 1980 and partially interim isolated in December 1982. Tank 241-S-101 is passively ventilated and is not on any Watch Lists. All monitoring systems were in compliance with documented standards as of April 30, 1996 (Hanlon 1996).

2.2 TANK DESIGN AND BACKGROUND

The 241-S Tank Farm was constructed during 1950 and 1951 in the 200 West Area. The farm contains twelve 100 series tanks. The tanks have a capacity of 2,870 kL (758 kgal), a diameter of 2.3 m (75.0 ft), and an operating depth of 7.0 m (23 ft) (Leach and Stahl 1996). The 241-S Tank Farm was designed for waste with a maximum fluid temperature of 104 °C (220 °F) (Brevick et al. 1994). A cascade overflow line 75 mm (3 in.) in diameter connects tank 241-S-101 as the first in a cascade series of three tanks finishing with tanks 241-S-102 and -103. Each tank in the cascade series is set 305 mm (1 ft) lower in elevation from the preceding tank. The cascade overflow height is approximately 6.9 m (22.7 ft) from the tank bottom and 370 mm (1.2 ft) below the top of the steel liner.

The tank has a dished bottom with a 1.2-m (4-ft) radius knuckle. Tank 241-S-101 was designed with a primary mild steel liner and a concrete dome with various risers. The tank is set on a reinforced concrete foundation. The tank and foundation were waterproofed by a coating of tar covered by a three-ply, asphalt-impregnated, waterproofing fabric. The waterproofing was protected by a welded-wire-reinforced cement-like mixture. One coat of primer was sprayed on all exposed interior tank surfaces. The ceiling of the tank dome was covered with six applications of a vinyl resin coating (Rutherford 1949). Lead flashing was used to protect the joint where the steel liner meets the concrete dome. Asbestos gaskets were used to seal the risers in the tank dome. The tank was covered with approximately 1.8 m (6 ft) of overburden.

Tank 241-S-101 has 12 risers, according to the drawings and engineering change notices. The risers range in diameter from 100 mm (4 in.) to 1.1 m (42 in.). Table 2-2 shows numbers, diameters, and descriptions of the risers and the inlet, overflow, and spare nozzles. A plan view that depicts the riser configuration is shown as Figure 2-1. Risers 4, 11, and 16, 100 mm (4 in.) in diameter, and riser 6, 300 mm (12 in.) in diameter, are available for use in sampling activities (Lipnicki 1996). A tank cross-section showing the approximate waste level along with a schematic of the tank equipment is shown in Figure 2-2.

Figure 2-1. Riser Configuration for Tank 241-S-101.

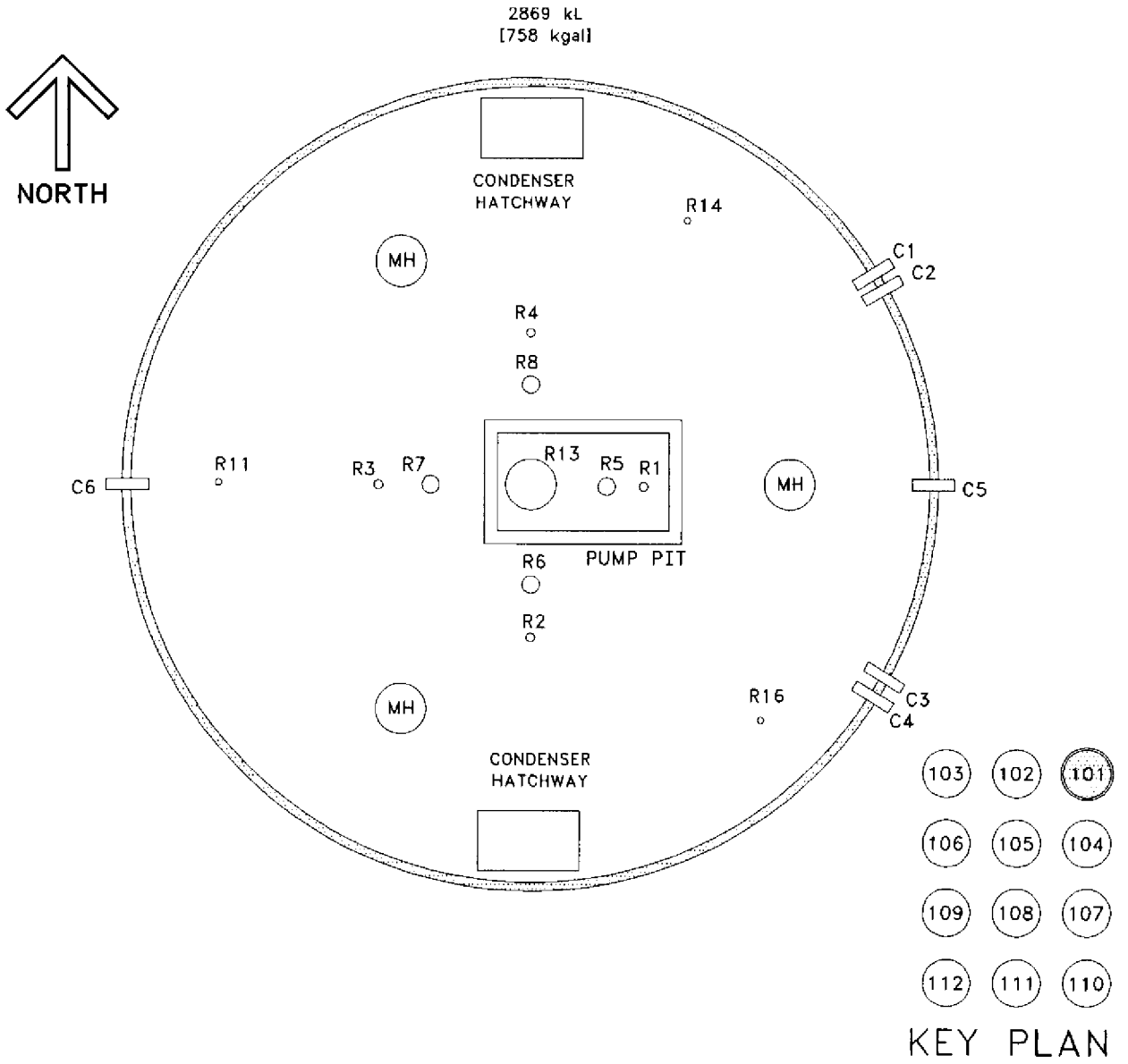


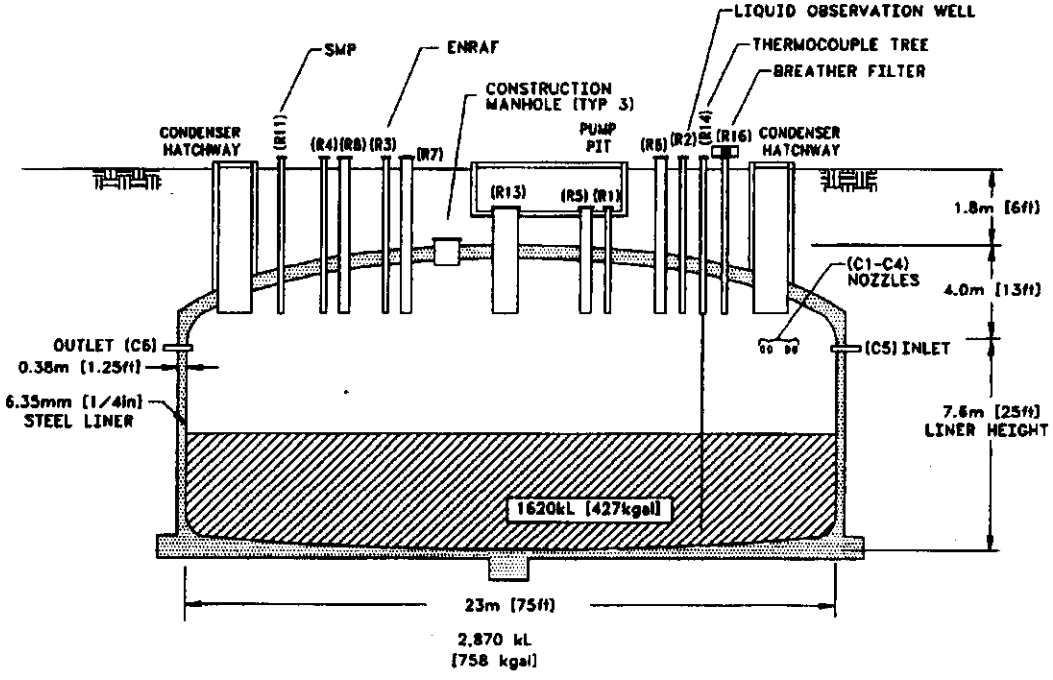
Table 2-2. Tank 241-S-101 Risers.[1,2,3,4]

Riser Number	Diameter		Description and Comments
	cm	in.	
1	10	4	Connection nozzle, pump pit drain
2	10	4	Liquid observation well, benchmark
3	10	4	ENRAF™
4	10	4	Flange, spare
5	30	12	Saltwell screen and pump
6	30	12	Observation port
7	30	12	Blank installed, unused
8	30	12	Plug
11	10	4	Sludge measurement port
13	110	42	Slurry distributor
14	10	4	Thermocouple tree
16	10	4	Breather filter, G-1 housing, benchmark
Nozzle Number	**Diameter**		**Description and Comments**
	cm	**in.**	
C1	8	3	Spare
C2	8	3	Spare
C3	8	3	Spare
C4	8	3	Spare
C5	8	3	Overflow inlet
C6	8	3	Overflow outlet

Notes:

[1]Alstad (1993)
[2]Tran (1993)
[3]Vitro Engineering Corporation (1980)
[4]ARHCO (1975)

Figure 2-2. Tank 241-S-101 Cross-Section.



2.3 PROCESS KNOWLEDGE

Section 2.3.1 includes all major transfers involving tank 241-S-101 and Table 2-3 presents the history of the major transfers that involved tank 241-S-101 receiving waste. Section 2.3.2 contains an estimate of the tank's contents based on historical data.

2.3.1 Waste Transfer History

Tank 241-S-101 first received high-level reduction-oxidation (REDOX) waste in the third and fourth quarters of 1953 (Agnew et al. 1996b). During this time, waste cascaded to tank 241-S-102 and was sent to catch tank S-003. In 1954, the tank received high level REDOX waste and REDOX cladding waste. During that year, waste cascaded to tank 241-S-102 and was sent to tank S-003. In the third quarter of 1955, the tank received REDOX cladding waste and flush water. Again, waste cascaded to tank 241-S-102 and was sent to tank S-003 during this year. During 1956, waste was sent to catch tank S-003.

Flush water was sent to the tank during the first quarter of 1958. The waste self-concentrated, causing a slow reduction in volume from 1958 until 1973. Supernatant waste was received from tank 241-U-107 and -108 during the fourth quarter of 1973. The waste in these tanks at the time of transfer included N Reactor waste, PNL waste, decontamination waste, cladding waste, and evaporator feed/bottoms. Waste was sent from tank 241-S-101 to tank 241-S-102 during this time.

During 1974, the tank received supernatant waste from tanks 241-S-102, -105, -107, -110, and -111; tank 241-SX-101; and tanks 241-U-103 and -107, as well as flush water. The waste in these tanks at the time of transfer included REDOX waste, evaporator waste, N reactor waste, and PNL waste. Waste was sent to tanks 241-S-102 and -107 during that year.

During 1975, the tank again received waste from tanks 241-S-105 and -107 and tank 241-S-102. Waste was sent to tank 241-S-102 during that year. During the first quarter of 1976, tank 241-S-101 received supernatant waste from tank 241-SX-105. Supernatant waste was sent from 241-S-101 to tank 241-SY-102 in the third quarter of 1978 and the first quarter of 1979 and to tanks 241-S-102 and -103 during the second quarter of 1979. Tank 241-S-101 received waste from tank 241-S-107 during the fourth quarter of 1979.

In 1980, the tank received waste from tanks 241-S-103 and 241-SX-104 and waste was sent to tanks 241-S-107 and 241-SY-102.

Tank 241-S-101 was declared inactive in 1980. Presently, the waste in tank 241-S-101 is classified as non-complexed (Hanlon 1996).

Table 2-3. Summary of Tank 241-S-101 Waste Input History.[1,2]

Transfer Source	Waste Type Received	Time	Estimated Volume	
			kL	kgal
S Plant (REDOX)	High-level REDOX waste	1953 - 1954	7,882	2,082
S Plant (REDOX)	REDOX cladding waste	1954 - 1955	1,321	349
Miscellaneous	Flush water	1955, 1958	155	41
241-U-107, 241-U-108	N Reactor waste, decontamination waste, PNL waste, cladding waste, evaporator feed/bottoms	1973	2,302	608
241-S-102, 241-S-105, 241-S-107, 241-S-110, 241-S-111, 241-SX-101, 241-U-103, 241-U-107	High-level REDOX waste, N Reactor waste, PNL waste, decontamination waste, evaporator bottoms	1974	23,890	6,311
Miscellaneous	Flush water	1974	424	112
241-S-102, 241-S-105, 241-S-107	High-level REDOX waste, N Reactor waste, PNL waste, decontamination waste, evaporator bottoms	1975	2,196	580
241-SX-105	Supernatant from evaporator bottoms	1976	996	263
241-S-103, 241-S-107	N Reactor waste, PNL waste, decontamination waste, evaporator bottoms	1979	450	262
241-S-103, 241-SX-104	Double-shell slurry feed waste	1980	1,711	452

Notes:

[1]Agnew et al. (1996b)

[2]Waste volumes and types are best estimates based on historical data.

2.3.2 Historical Estimation of Tank Contents

The following is an estimate of the contents for tank 241-S-101 based on historical transfer data. The estimates have not been validated and thus should be used with caution. The historical data used for the estimates are from the *Waste Status and Transaction Record Summary for the Southwest Quadrant* (WSTRS) (Agnew et al. 1996b), and the *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 3* (Agnew et al. 1996a). Agnew et al. (1996a) contains the HDW list, the TLM, and the Supernatant Mixing Model (SMM). The WSTRS is a compilation of available waste transfer and volume status data. The HDW provides the assumed typical compositions for Hanford Site waste types. In most cases, the available data are incomplete reducing the reliability of the transfer data and the modeling results derived from it. The TLM takes the WSTRS data, models the waste deposition processes and, using additional data from the HDW (which may introduce more error), generates an estimate of the tank contents. Thus, these model predictions can only be considered estimates that require further evaluation using analytical data.

Based on the TLM, tank 241-S-101 contains five layers of waste, a top layer of 314 kL (83 kgal) of SMM S2 saltslurry from the 242-S campaign, 1977-80 (SMMS2) above a layer of 458 kL (121 kgal) of SMM S1 saltcake from the 242-S campaign, 1973-76 (SMMS1). Beneath these layers is a layer of 341 kL (90 kgal) saltcake from S and SX tank farms (RSltCk), which is above layers of 110 kL (29 kgal) of REDOX cladding waste, 1952-60 (CWR1) and 348 kL (92 kgal) of REDOX waste, 1952-57 (R1). Definitions for the TLM terminology can be found in the cited parent documents. Figure 2-3 shows a graph representing the estimated waste type and volumes for the tank layers. The R1 layer should contain large quantities of sodium, hydroxide, nitrite, aluminum, and iron; lesser amounts of chromium, calcium, and carbonate; and small quantities of nickel, nitrate, sulfate, silicate, and chloride. This layer will show moderate activity from the amounts of cesium and strontium. The layer of CWR1 should contain large quantities of sodium, aluminum, and hydroxide; lesser amounts of iron, lead, calcium, nitrite, nitrate, and carbonate; and small amounts of sulfate, silicate, and chloride. The amount of cesium and strontium is very low. The layer of RSltCk should contain large quantities of sodium, aluminum, hydroxide, nitrate, and nitrite; lesser amounts of chromium, silicate, and chloride; and small amounts of calcium, potassium, carbonate, iron, nickel, ammonia, and sulfate. This layer will show low activity from the amounts of cesium and strontium. The SMMS1 layer should contain large quantities of sodium, nitrate, nitrite, and aluminate; lesser amounts of hydroxide, fluoride, phosphate, carbonate, sulfate, glycolate, and chloride; and smaller amounts of chromium, potassium, citrate, EDTA, HEDTA, dibutyl phosphate (DBP), ammonium, butanol, and silicate. The SMMS1 layer contains small amounts of cesium and strontium resulting in low activity within the layer. The SMMS2 waste layer is similar to the SMMS1 layer but with greater amounts of HEDTA, potassium, hydroxide, and fluoride. The cesium and strontium content is also similar to the SMMS1 layer, thus a low amount of activity will be found. Table 2-4 shows an estimate of the expected waste constituents and their concentrations.

Figure 2-3. Tank Layer Model for Tank 241-S-101.

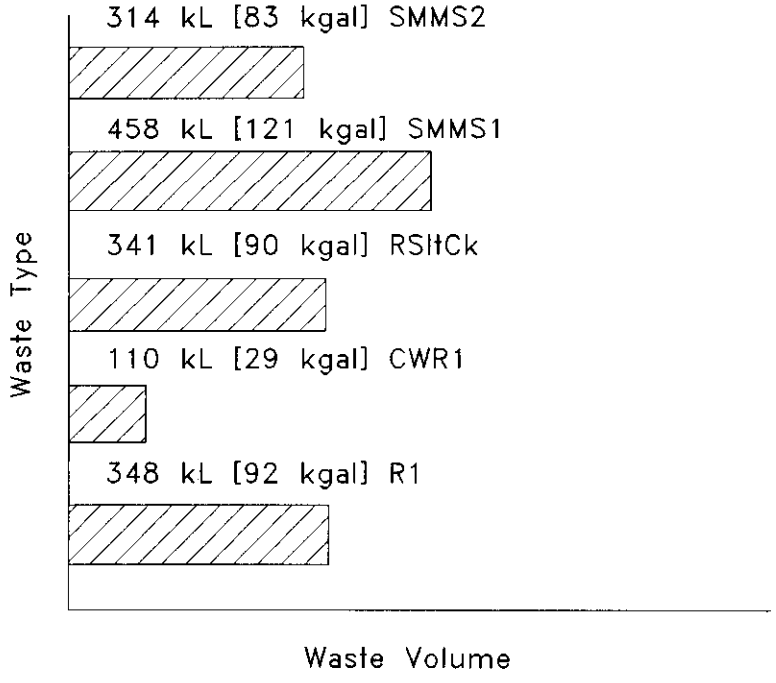


Table 2-4. Tank 241-S-101 Inventory Estimate.[1,2] (2 Sheets)

Total Inventory Estimate			
Physical Properties			
Total Waste	2.41E+06 kg (427 kgal)		
Heat Load	5,010 W (17,100 Btu/hr)		
Bulk Density	1.49 g/mL		
Water wt%	45.8		
Total Organic Carbon wt% Carbon (wet)	0.361		
Chemical Constituents	**M**	**ppm**	**kg[3]**
Na^+	7.81	1.21E+05	2.90E+05
Al^{3+}	2.61	47,300	1.14E+05
Fe^{3+} (total Fe)	0.236	8,860	21,300
Cr^{3+}	0.262	9,130	22,000
Bi^{3+}	5.12E-04	71.8	173
La^{3+}	1.40E-05	1.31	3.15
Hg^{2+}	2.81E-04	37.8	91.1
Zr (as $ZrO(OH)_2$)	3.53E-04	21.6	52.0
Pb^{2+}	0.00844	1,170	2,830
Ni^{2+}	0.0169	665	1,600
Sr^{2+}	4.67E-06	0.275	0.662
Mn^{4+}	0.00168	61.9	149
Ca^{2+}	0.0850	2,290	5,500
K^+	0.0304	797	1,920
OH^-	11.1	1.27E+05	3.05E+05
NO_3^-	3.31	1.38E+05	3.32E+05
NO_2^-	1.89	58,300	1.40E+05
CO_3^{2-}	0.256	10,300	24,900
PO_4^{3-}	0.0374	2,390	5,750
SO_4^{2-}	0.115	7,420	17,900
Si (as SiO_3^{2-})	0.0646	1,220	2,930
F^-	0.0289	368	886
Cl^-	0.120	2,840	6,850
citrate$^-$	0.0129	1,640	3,940

Table 2-4. Tank 241-S-101 Inventory Estimate.[1,2] (2 Sheets)

Total Inventory Estimate			
Chemical Constituents	**M**	**ppm**	**kg[3]**
$EDTA^{4-}$	0.00651	1,260	3,030
$HEDTA^{3-}$	0.0120	2,220	5,330
glycolate	0.0391	1,970	4,740
acetate	0.00313	124	298
oxalate	1.20E-05	0.709	1.71
DBP	0.00844	1,510	3,630
butanol	0.00844	420	1,010
NH_3	0.0590	673	1,620
$Fe(CN)_6^{4-}$	0	0	0
Radiological Constituents	**Ci/L**	**μCi/g**	**Ci[3]**
Pu	---	0.162	6.51 (kg)
U	0.0295 (M)	4,710 (μg/g)	11,300 (kg)
Cs	0.184	123	2.97E+05
Sr	0.332	223	5.37E+05

Notes:

[1]Agnew et al. (1996a)

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

[3]Differences appear to exist among the inventory above and the inventories calculated from the two sets of concentrations. These differences are being evaluated.

2.4 SURVEILLANCE DATA

Tank 241-S-101 surveillance consists of liquid and solid surface level measurements, and waste and headspace temperature monitoring inside the tank. These data provide the basis for determining tank integrity.

Liquid level measurement may indicate if there is a major leak from a tank. Solid surface level measurements provide an indication of physical changes and consistency of the solid layers. Tank 241-S-101 has one liquid observation well, which is located in riser 2 and is used to measure interstitial liquid levels. Drywells are located around the perimeter of the tank to enable monitoring of increased radiation due to leakage. Five drywells have been identified for tank 241-S-101, and none are considered active.

2.4.1 Surface Level

The surface level of the waste has been monitored with an ENRAF™ surface level gauge through riser 3 since February 1996. The ENRAF™ surface level reading on April 30, 1996 was 4.09 m (160.96 in.) (WHC 1996). Surface level measurements with the Food Instrument Corporation probe have remained steady from February 1981 to January 1995, averaging 4.1 m (161.3 in.) with a range from 4.08 m (160.8 in.) to 4.12 m (162.4 in.). A graphical representation of the tank volume history is presented in Figure 2-4.

2.4.2 Internal Tank Temperatures

Tank 241-S-101 has one thermocouple tree in riser 14 with 6 thermocouples to monitor the waste temperature. Elevations are available for all thermocouples. Plots of the individual thermocouple readings can be found in the S Farm supporting document (Brevick et al. 1994).

The following temperature data were obtained from the Surveillance Analysis Computer System (SACS) database (WHC 1996). The mean temperature for the recorded period from January 4, 1988, to June 20, 1996, was 43.4 °C (110.2 °F) with a minimum of 28.2 °C (82.8 °F) and a maximum of 58.2 °C (136.8 °F). On June 20, 1996, the low temperature recorded was 30.8 °C (87.4 °F) on thermocouple 6. The high temperature recording was 46.6 °C (115.9 °F) on thermocouple 3. Thermocouple 3 is in the waste while thermocouple 6 is in the tank headspace. The graph of the weekly high temperature is provided as Figure 2-5.

2.4.3 Tank 241-S-101 Photographs

The March 18, 1988, photographic montage of tank 241-S-101 interior shows the waste surface in the center of the tank as a dark brown sludge, while the surface around the perimeter of the tank resembled saltcake. Recent measurements indicate that there is approximately 1,630 kL (430 kgal) of waste, indicating a waste depth of 4.3 m (14 ft) (Brevick et al. 1994).

Figure 2-4. Tank 241-S-101 Level History.

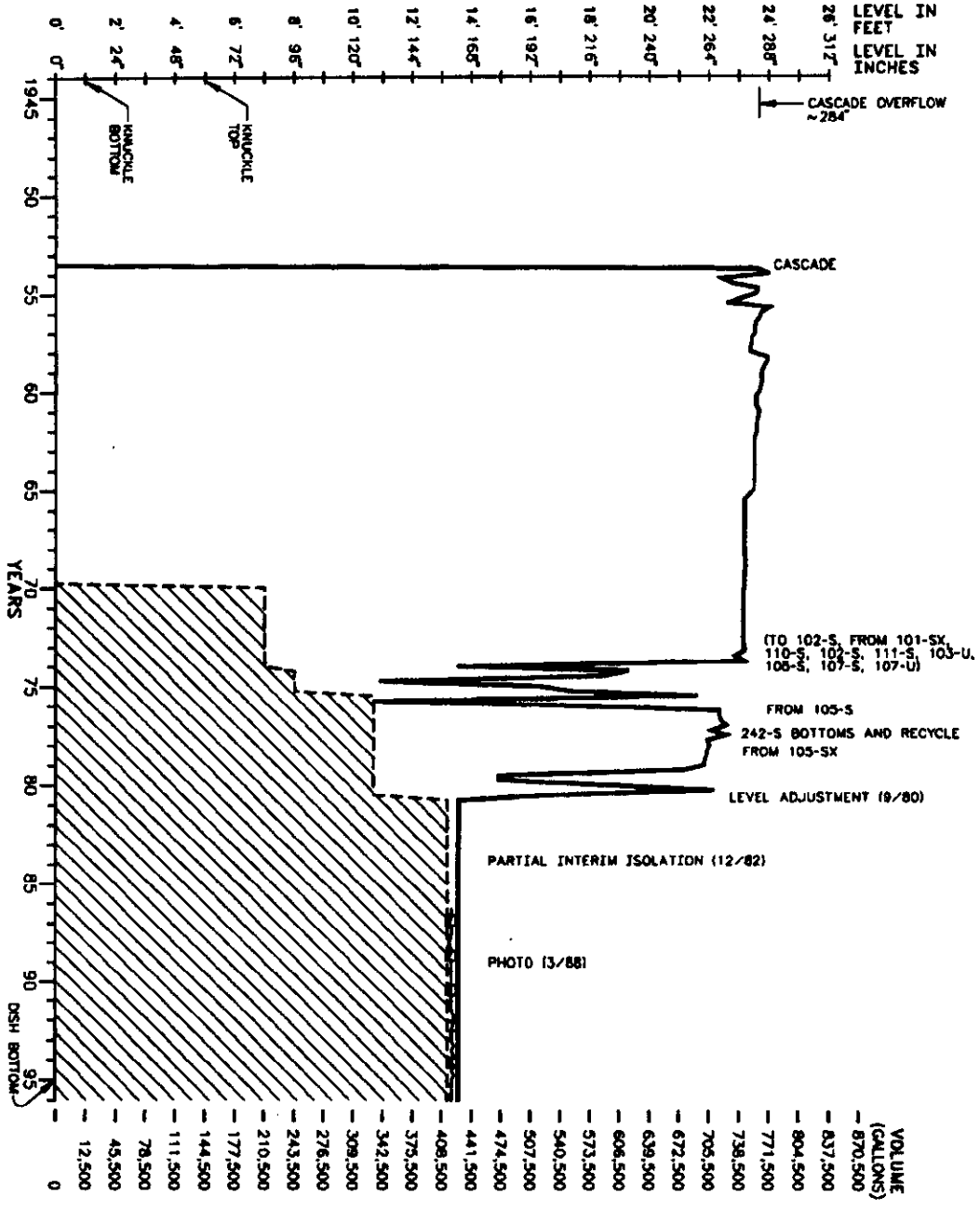
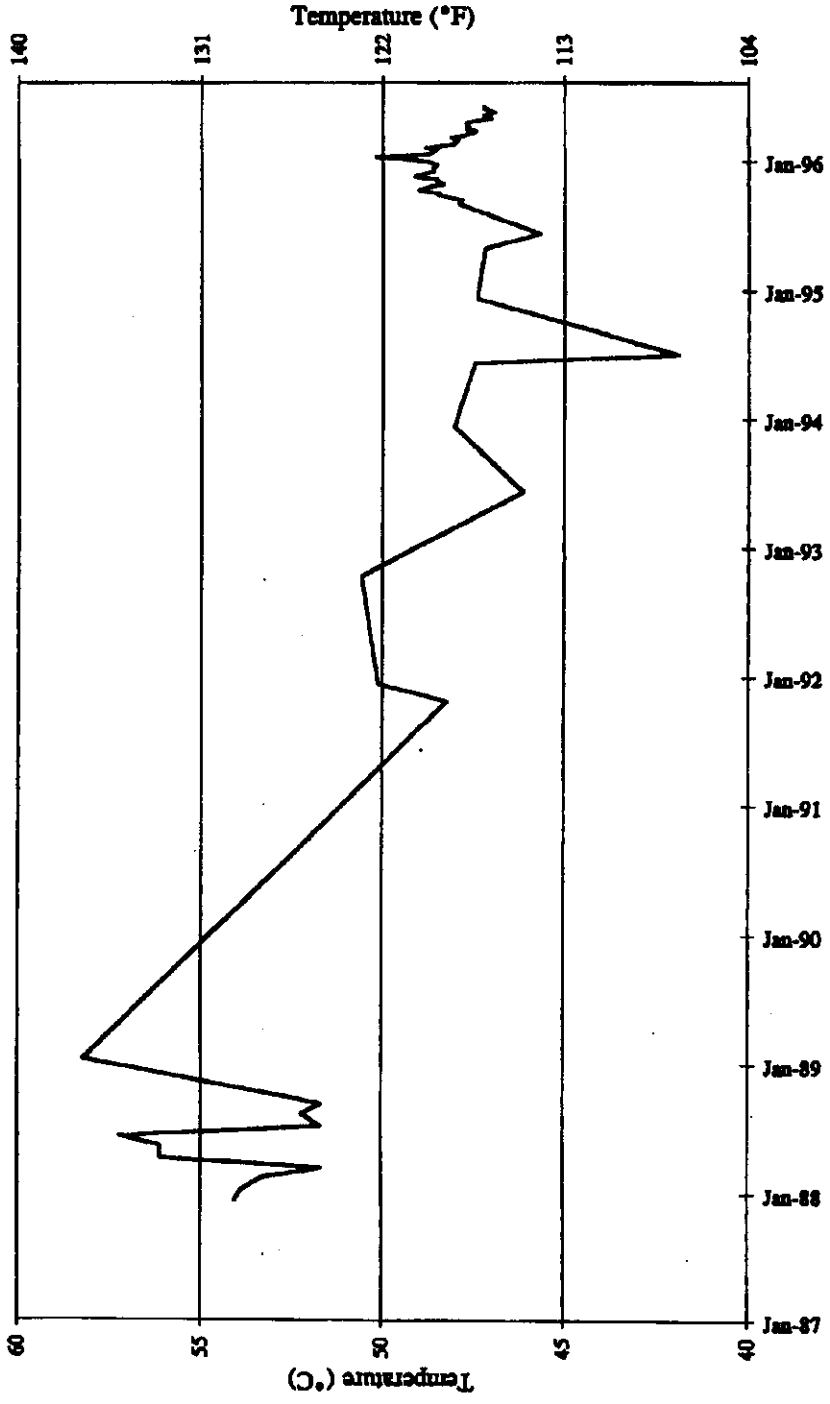


Figure 2-5. Tank 241-S-101 Weekly High Temperature Plot.



3.0 TANK SAMPLING OVERVIEW

This section describes the March/April 1996 sampling and analysis event for tank 241-S-101. Three push-mode core samples using a rotary core truck were taken to satisfy the requirements of the safety screening DQO (Dukelow et al. 1995), the historical model evaluation DQO (Simpson and McCain 1995), and the pretreatment program (Kupfer et al. 1996). The sampling and analyses were performed in accordance with the SAP (Kruger 1996). Further discussions of the sampling and analysis procedures can be found in the *Tank Characterization Reference Guide* (De Lorenzo et al. 1994).

Table 3-1 summarizes the sampling mode, applicable DQOs, and sampling and analysis requirements for the 1996 sampling event.

Table 3-1. Integrated Data Quality Objective Requirements for Tank 241-S-101.[1]

Sampling Event	Applicable DQOs	Sampling Requirements	Analytical Requirements
Push-mode core sampling (March/April 1996)	Safety screening (Dukelow et al. 1995)	Vertical profiles from two widely spaced risers	▸ Energetics ▸ Moisture content ▸ Total alpha activity ▸ Density/SpG ▸ Flammable gas ▸ Total alpha
	Historical model evaluation (Simpson and McCain 1995)		▸ Energetics ▸ Moisture content ▸ ^{137}Cs ▸ Metals (Al, Cr, Na, U) ▸ Anions ▸ Total alpha activity ▸ Bulk density ▸ TOC ▸ Total uranium ▸ Total beta ▸ ^{90}Sr
	Pretreatment program (Kupfer et al. 1995)	▸ Remove 125 mL of solid composite for process development work ▸ Archive 100 mL of solid and liquid composite for the pretreatment program	N/A

Note:
[1]Fritts (1996)

3.1 DESCRIPTION OF SAMPLING EVENT

Three push-mode core samples (using a rotary core truck) were collected from tank 241-S-101 between March 12 and April 3, 1996. Cores 137, 138, and 142 were obtained from risers 4, 6, and 11, respectively. All samples were received and extruded at the Westinghouse Hanford Company 222-S Laboratory in accordance with the SAP (Kruger 1996). However, as directed by the tank coordinator, core 137 samples were not used for analyses at the 222-S Laboratory. This decision was based on difficulties with the sampling efforts that would have made the vertical profile of the tank contents much more difficult. The material was composited and a subsample was sent to the Pretreatment Program to fulfil the SAP requirements (Kruger 1996).

In addition, the tank headspace vapors were measured for flammability (not concentration) as required by the safety screening DQO. Results for total organic vapor, oxygen, ammonia, and the lower flammability limit (LFL) of the flammable gases were obtained.

3.2 SAMPLE HANDLING

Cores 137, 138 and 142 were received by the Westinghouse Hanford Company 222-S Laboratory between March 13 and April 23, 1996. Each sample was extruded between March 18 and April 29, 1996, and analyzed in accordance with the SAP (Kruger 1996).

Core 138 contained drainable liquid (DL) and liner liquid (LL). Several segments in cores 138 and 142 contained no solids or liquids. The remaining segments of the three cores contained solids that resembled sludge and sludge-slurry of slightly different colors. Sample recovery was variable, depending on the particular segment. No separable organic layer was observed in any of the segments. One field blank was delivered to the 222-S Laboratory with core 138. All three cores were subsampled at the whole-segment or half-segment level, depending on the amount of material recovered and the appearance of the extruded segments. Core composites were formed from cores 138 and 142 in accordance with the historical DQO. Table 3-2 presents the subsampling scheme, the amount of sample recovered, the drill string dose rates, and a visual description of the samples.

Table 3-2. Subsampling Scheme and Sample Description[1]. (3 sheets)

Segment	Sub-segment	Solids extruded (in.)	Total Sample Weight (g)	Drill String Dose Rate (mR/hr)	Description	
					Color	Texture
Core 137 Riser 4						
1	N/A	N/A	N/A	5	N/A	No solids or DL present
2				3		
3				150		
4				30		
5	Upper ½	1.5	53.8	400	Black	Resembled a sludge
6	N/A	N/A	N/A	20	N/A	No solids or DL present
7	Upper ½	19.0	243.8	1,000	Black	Resembled a sludge
	Lower ½		259.8			
8	Upper ½	7.5	174.0	600	Black	Resembled a pasty sludge
9	Upper ½	7.0	453.7	500	Gray. The bottom 2 inches contained white pieces mixed with gray sludge.	Resembled a moist sludge
	Lower ½		413.9			
Core 138 Riser 6						
1	N/A	N/A	N/A	3	N/A	No solids or DL present
1R	DL	N/A	330.8	1,400	Green and opaque	N/A
2	N/A	N/A	N/A	7	N/A	No solids or DL present
2R				20		
2-R-1	DL	N/A	354.0	1,600	Green and opaque	N/A
	Lower ½	not measurable	33.2		Dark gray	Resembled a sludge-slurry
Core 138 Riser 6 (Cont.)						
3	N/A	N/A	N/A	80	N/A	No solids or DL present
3R	DL	N/A	97.9	1,200	Gray and opaque	N/A

Table 3-2. Subsampling Scheme and Sample Description[1]. (3 sheets)

Segment	Sub-segment	Solids extruded (in.)	Total Sample Weight (g)	Drill String Dose Rate (mR/hr)	Description	
					Color	Texture
3AR	Whole	14	393.6	250	Dark gray	Resembled a sludge.
4	N/A	N/A	N/A	40	N/A	No solids or DL present
4R				5		
5	Upper ½	18.0	212.4	1,300	Dark brown	Resembled a sludge
	Lower ½		222.0			
6	Upper ½	17.0	220.3	1,200	Dark gray	Resembled a very damp sludge
	Lower ½		209.9			
7	Upper ½	18.0	83.9	1,000	Dark brown to black	Resembled a sludge
	Lower ½		116.7			
8	Upper ½	16.0	184.9	800	Dark gray	Resembled a damp sludge
	Lower ½		180.3			
9	Upper ½	12.0	185.6	500	Dark gray to dark brown	Resembled a sludge
	Lower ½		132.8			
Field Blank	DL	N/A	115.6	< 0.5	Clear and colorless	N/A

Table 3-2. Subsampling Scheme and Sample Description[1]. (3 sheets)

Segment	Sub-segment	Solids extruded (in.)	Total Sample Weight (g)	Drill String Dose Rate (mR/hr)	Description	
					Color	Texture
Core 142 Riser 11						
1	Upper ½	13.0	352.8	1,400	Dark gray	Resembled a wet sludge
2	Upper ½	19.0	194.0	1,400	Gray black	Resembled a wet sludge
	Lower ½		195.7			
3	Upper ½	19.0	192.5	1,300	Grayish black	Resembled a wet sludge
	Lower ½		193.8			
4	Upper ½	17.0	205.1	1,200	Dark grayish black	Resembled a damp sludge
	Lower ½		234.7			
5	Upper ½	19.0	249.4	1,000	Dark grayish black	Resembled a damp sludge
	Lower ½		231.9			
6	Upper ½	19.0	274.7	1,000	Black	Resembled a damp sludge
	Lower ½		227.0			
7	Upper ½	19.0	250.2	1,000	Black	Resembled a damp sludge
	Lower ½		271.4			
8	Upper ½	13.0	223.1	450	Dark gray	Resembled a damp sludge
	Lower ½		133.8			

Notes:

N/A = Not applicable
DL = drainable liquid

[1]Fritts (1996)

3.3 SAMPLE ANALYSIS

As noted in Table 3-1, the safety screening DQO required analyses for thermal properties by DSC, moisture by TGA, fissile content by total alpha analysis, and bulk density (specific gravity for the drainable liquid sample). In addition to the core samples, the flammability of the tank headspace was measured prior to core sampling.

Bromide analysis by IC and lithium analysis by ICP were required by the SAP to determine the amount of wash water contamination in the samples. Anion IC results and ICP data for other analytes were also reported in order to satisfy the requirements of the historical DQO.

The IC analyses were performed on each solid subsegment and core composite after preparation by a water leach, as required by the historical DQO. For all ICP analyses, the solid subsegments and core composites were prepared for analysis by acid and fusion digestion methods. In addition, a water-leached aliquot from each of the core composite samples was analyzed by ICP.

Laboratory control checks included, where appropriate, laboratory control standards, matrix spikes, duplicate analyses, and blanks. An assessment of the quality control (QC) procedures and the data is presented in Section 5.1.2 of this report.

All reported analyses were performed in accordance with approved laboratory procedures. A list of the sample numbers and applicable analyses is presented in Table 3-3. Table 3-4 displays the analytical procedures by title and number. No deviations or modifications were noted by the laboratory.

3.4 DESCRIPTION OF EARLIER SAMPLING EVENTS

This section presents a discussion of historical sampling and analysis events for tank 241-S-101. Data have been compiled for the samples obtained from the late 1950s to the present for single-shell tanks in the 200 East and West areas of the Hanford Site. The analytical results of five samples analyzed between 1971 and 1991 were obtained from historical records and are presented in Appendix C. A comparison between the 1991 results and the current sampling event is made in Section 5.2.

3.4.1 Sample Handling and Analysis (1971)

A sample was reported on September 21, 1971 in support of 242-S Evaporator operations. Neither the date of sample retrieval nor date of analysis is given. A description of the technique or procedure used to obtain the sample was not available, and no information concerning the sampled riser or sample depth was available. No information was available as to how the sample was handled once received for analysis. The data are presented in Appendix C for completeness, and if used, should be done so with caution.

Table 3-3. Summary of Samples and Analyses.[1] (5 sheets)

Core	Segment	Segment Portion	Analyses
138	1R	DL	DSC, TGA, SpG, ICP (Acid dil.), IC, Alpha
	2R1	DL	DSC, TGA, SpG, ICP (Acid dil.), IC, Alpha
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
	3R	DL	DSC, TGA, SpG, ICP (Acid dil.), IC, Alpha
	3AR	Whole	DSC, TGA ICP (Fusion), GEA, Alpha
	5	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), Alpha ICP (Acid) IC
	6	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC

Table 3-3. Summary of Samples and Analyses.[1] (5 sheets)

Core	Segment	Segment Portion	Analyses
138	7	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	8	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	9	LL	DSC, SpG, TGA, TIC, TOC, ICP (Acid), IC, Alpha
		Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
	Field Blank		DSC, SpG, TGA, ICP (Acid dil.), IC, Alpha
	Composite		Bulk Density DSC, TGA, TIC, TOC ICP (Fusion), GEA, Alpha, Beta, U, $^{89/90}Sr$ ICP (Acid) IC ICP (Water)

Table 3-3. Summary of Samples and Analyses.[1] (5 sheets)

Core	Segment	Segment Portion	Analyses
142	1	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	2	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density TGA, DSC ICP (Fusion), GEA, Alpha ICP (Acid) IC
	3	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	4	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	5	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC

Table 3-3. Summary of Samples and Analyses.[1] (5 sheets)

Core	Segment	Segment Portion	Analyses
142	5	Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	6	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
	7	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC

Table 3-3. Summary of Samples and Analyses.[1] (5 sheets)

Core	Segment	Segment Portion	Analyses
142	8	Upper ½	Bulk Density DSC, TGA ICP (Fusion), GEA ICP (Acid) IC
		Lower ½	Bulk Density DSC, TGA ICP (Fusion), GEA, Alpha ICP (Acid) IC
	Composite		Bulk Density DSC, TGA, TIC, TOC ICP (Fusion), GEA, Alpha, Beta, U, $^{89/90}Sr$ ICP (Acid) IC ICP (Water)
Vapor Tests	Tank Headspace		Combustible gas meter readings for flammable gas

Notes:

Dil. = dilution
GEA = gamma energy analysis

[1]Fritts (1996)

Table 3-4. Analytical Procedures.[1]

Analysis	Instrument	Preparation Procedure	Analytical Procedure[2]
Energetics by DSC	Mettler™ Perkin-Elmer™	N/A	LA-514-113, Rev. C-1 LA-514-114, Rev. C-1
Percent water by TGA	Mettler™ Perkin-Elmer™	N/A	LA-560-112, Rev. B-1 LA-514-114, Rev. C-1
Total alpha activity	Alpha proportional counter	Fusion digest on solid samples, LA-549-141, Rev. F-0; Direct on liquid samples	LA-508-101, Rev. D-2
Bulk density	N/A	N/A	LO-160-103, Rev. B-0
Specific gravity	N/A	N/A	LA-510-112, Rev. C-3
Lithium and other metals by ICP	Inductively coupled plasma spectrometer	LA-549-141, Rev. F-0 LA-505-159, Rev. D-0 LA-504-101, Rev. E-0	LA-505-151, Rev. D-3 LA-505-161, Rev. B-1
Bromide and other anions by IC	Ion chromatograph	Water leach LA-504-101, Rev. E-0	LA-533-105, Rev. D-1
TIC	Coulometer	N/A	LA-342-100, Rev. D-0
TOC	Coulometer	N/A	LA-342-100, Rev. D-0
GEA	Gamma spectrometer	Fusion digest LA-549-141, Rev. F-0	LA-548-121, Rev. D-1
^{90}Sr	Beta proportional counter		LA-220-101, Rev. D-1
Total beta	Beta proportional counter		LA-508-101, Rev. D-2
Uranium	Laser phosphorimeter	Fusion digest LA-549-101, Rev. F-0	LA-925-009, Rev. A-1
Flammable Gas	Combustible gas meter	N/A	WHC-IP-030, IH 1.4 and IH 2.1

Notes:

Rev. = revision
Mettler™ is a registered trademark of Mettler Electronics, Anaheim, California.
Perkin-Elmer™ is a registered trademark of Perkins Research and Manufacturing Company, Inc., Canoga Park, California.

TIC = total inorganic carbon

[1]Fritts (1996)
[2]Internal procedures of Westinghouse Hanford Company, Richland, Washington.

3.4.2 Sample Handling and Analysis (1974)

A sample was received on September 13, 1974, and reported on December 20, 1974. A description of the technique or procedure used to obtain the sample was not available, and no information concerning the sampled riser or sample depth was available. No information was available as to how the sample was handled once received for analysis. The data are presented in Appendix C for completeness, and if used, should be done so with caution.

3.4.3 Sample Handling and Analysis (1975)

A sample was received on June 4, 1975, and reported on July 16, 1975. The sample was dark brown in color and had the consistency of soft mud. A description of the technique or procedure used to obtain the sample was not available, and no information concerning the sampled riser or sample depth was available. The sample was prepared by fusing a known volume of solids with KOH, dissolving the melt with concentrated HCl, and then diluting with water. The data are presented in Appendix C for completeness, and if used, should be done so with caution.

A sample was received on November 19, 1975, and reported on December 5, 1975. A description of the technique or procedure used to obtain the sample was not available, and no information concerning the sampled riser or sample depth was available. No information was available as to how the sample was handled once received for analysis.

3.4.4 Sample Handling and Analysis (1991)

A sample identified as T-8579 was received on December 17, 1991, and reported on December 30, 1991. A description of the technique or procedure used to obtain the sample was not available, and no information concerning the sampled riser or sample depth was available. No information was available as to how the sample was handled once received for analysis. The data are presented in Appendix C for completeness, and if used, should be done so with caution.

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4.0 ANALYTICAL RESULTS

This section presents a summary of the analytical results associated with the March/April 1996 core sampling event of tank 241-S-101. This plan integrates all documents related to sampling and analytical requirements, including applicable DQOs. All analyses were performed at the Westinghouse Hanford Company 222-S Laboratory.

Tabulated locations of analytical results are given in Table 4-1. Comprehensive analytical data are found in Appendix A. Only analyte overall means are reported in Section 4.0. Appendix B contains data for lithium and bromide, the analytes evaluated to gauge the amount of contamination by the wash water used during sampling. These analytes are not part of the waste in the tank.

Table 4-1. Analytical Data Presentation Tables.

Data Type	Tabulated Location
Chemical data summary	Table 4-2
DSC exothermic data summary	Table 4-3
Comprehensive analytical data	Appendix A
Wash water contamination check data	Appendix B
Historical sampling data	Appendix C

4.1 DATA PRESENTATION

This section presents a summary of the analytical results associated with the March/April 1996 core sampling event of tank 241-S-101. The subsections below provide information about the chemical, physical, vapor, and wash water contamination check data. The analytical data were tabulated in *Final Results for Tank 241-S-101, Cores 137, 138, and 142* (Fritts 1996).

4.1.1 Chemical Data Summary

Table 4-2 presents the mean concentration estimates and inventories for the solid and liquid results separately, as well as a total tank inventory based on both waste phases. Data from cores 138 and 142 were combined to derive the overall concentration means for all analytes. The overall means are weighted means, and were calculated by first averaging the individual

primary and duplicate results for each subsegment to obtain a subsegment mean. Next, the segment means for an individual core were averaged to derive a core mean. Finally, the two core means were averaged to obtain the overall mean. Not all of these steps are necessary for each analyte or each subsegment, but the procedure to be followed is the same. When 50 percent or more of the individual primary/duplicate measurements had detected results, the overall mean was reported as a detected value. Conversely, when results for more than half of the individual primary/duplicate results were nondetected, the overall mean was reported as a less than (<) value. When nondetected values are used as qualitative results the mean concentration and inventory estimates are biased. The magnitude of the bias cannot be determined, but the bias is to more conservative concentration estimates. These particular results should be used with caution.

Table 4-2 presents the overall means in columns two and five for the liquid and solid portions of the waste, respectively. The original subsegment analytical data are listed in Appendix A.

Relative standard deviations of the mean (RSD [Mean]), defined as 100 times the standard deviation of the mean divided by the tank mean, were calculated using standard analysis of variance (ANOVA) techniques (nested models). They are reported in columns three and six of Table 4-2, and were calculated only for those analytes that had 50 percent or more of their individual primary/duplicate results above the detection limit. Using nondetected results in the mean calculation also requires their use in the RSD (mean) calculations. Whereas the use of nondetected results in the mean calculations produces a known high bias, using these values in statistical calculations creates an unknown bias. Thus, the RSD (mean) estimates and the ANOVA results in which nondetected data were used should be used with caution.

The liquid inventory, presented in column four, was calculated by multiplying the overall mean by the supernatant waste volume (45 kL [12 kgal]), and dividing by a unit conversion factor of 1E+03. The solid inventory, presented in column seven, was calculated by multiplying the overall mean by the mean solid density (1.65 g/mL) and the solid waste volume (1,571 kL [415 kgal]), and dividing by a unit conversion factor of 1E+03. Total inventory results are the summation of the liquid and solid inventories, and are listed in column eight.

Table 4-2. Solid and Liquid Chemical Data Summary for Tank 241-S-101. (4 Sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solids Concentration	Solids RSD (Mean)	Solids Inventory	Total Inventory
METALS	µg/mL	%	kg	µg/g	%	kg	kg
Aluminum	24,500	2.9	1,100	80,500[1]	14.7	2.09E+05	2.10E+05
Antimony	< 24.1	N/A	< 1.08	< 23.2	N/A	< 60.1	< 61.2
Arsenic	< 40.1	N/A	< 1.80	< 38.7	N/A	< 100	< 102
Barium	< 20.1	N/A	< 0.905	< 26.1	N/A	< 67.7	< 68.6
Beryllium	< 2.00	N/A	< 0.0900	< 1.94	N/A	< 5.03	< 5.12
Bismuth	< 40.1	N/A	< 1.80	< 47.5	N/A	< 123	< 125
Boron	70.4	1.5	3.17	86.6	24.1	224	227
Cadmium	< 2.00	N/A	< 0.0900	4.46	31.4	11.6	11.7
Calcium	< 40.1	N/A	< 1.80	329	10.5	853	855
Cerium	< 40.1	N/A	< 1.80	< 38.8	N/A	< 101	< 103
Chromium	813	1.3	36.6	7,250[1]	20.5	18,800	18,800
Cobalt	< 8.02	N/A	< 0.361	< 7.75	N/A	< 20.1	< 20.5
Copper	< 4.01	N/A	< 0.180	12.7	21.4	32.9	33.1
Iron	< 20.1	N/A	< 0.905	1,360[1]	8.2	3,530	3,530
Lanthanum	< 20.1	N/A	< 0.905	< 19.6	N/A	< 50.8	< 51.7
Lead	< 40.1	N/A	< 1.80	< 51.5	N/A	< 133	< 135
Magnesium	< 40.1	N/A	< 1.80	< 42.3	N/A	< 110	< 112
Manganese	< 4.01	N/A	< 0.180	1,540[1]	17.8	3,990	3,990
Molybdenum	84.6	3.2	3.81	33.4	13.3	86.8	90.6

Table 4-2. Solid and Liquid Chemical Data Summary for Tank 241-S-101. (4 Sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solids Concentration	Solids RSD (Mean)	Solids Inventory	Total Inventory
METALS (Cont.)	µg/mL	%	kg	µg/g	%	kg	kg
Neodymium	< 40.1	N/A	< 1.80	< 41.6	N/A	< 108	< 110
Nickel	< 8.02	N/A	< 0.361	89.9	19.2	233	233
Phosphorous	1,260	7.7	56.7	1,400	24.5	3,630	3,690
Potassium	2,360	6.5	106	926	10.2	2,400	2,510
Samarium	< 40.1	N/A	< 1.80	< 38.7	N/A	< 100	< 102
Selenium	< 43.0	N/A	< 1.94	< 38.7	N/A	< 100	< 102
Silicon	164	19.3	7.38	< 1,390[1]	N/A	< 3,600	< 3,610
Silver	15.3	1.1	0.689	10.9	6.2	28.3	29.0
Sodium	2.15E+05	0.7	9,680	1.49E+05[1]	4.8	3.86E+05	3.96E+05
Strontium	< 4.01	N/A	< 0.180	292[1]	10.9	757	757
Sulfur	1,860	5.1	83.7	1,960	50.9	5,080	5,160
Thallium	< 80.2	N/A	< 3.61	< 77.5	N/A	< 200	< 204
Titanium	< 4.01	N/A	< 0.180	5.84	14.3	15.1	15.3
Uranium	< 200	N/A	< 9.00	4,680	23.9	12,100	12,100
Vanadium	< 20.1	N/A	< 0.905	< 19.4	N/A	< 50.3	< 51.2
Zinc	28.6	27.5	1.29	27.8	7.0	72.1	73.4
Zirconium	< 4.01	N/A	< 0.180	22.7	16.5	58.8	60.0

Table 4-2. Solid and Liquid Chemical Data Summary for Tank 241-S-101. (4 Sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solids Concentration	Solids RSD (Mean)	Solids Inventory	Total Inventory
ANIONS	**µg/mL**	**%**	**kg**	**µg/g**	**%**	**kg**	**kg**
Chloride	7,450	1.3	335	3,460	9.5	8,970	9,310
Fluoride	< 106	N/A	< 4.77	< 233	N/A	596	601
Nitrate	1.81E+05	1.7	8,150	1.62E+05	25.1	4.20E+05	4.28E+05
Nitrite	94,000	1.0	4,230	49,200	8.4	1.28E+05	1.32E+05
Oxalate	< 858	N/A	< 38.6	5,700	44.7	14,800	14,800
Phosphate	3,600	6.1	162	3,680	56.3	9,540	9,700
Sulfate	5,650	4.6	254	7,250	46.1	18,800	19,100
RADIONUCLIDES	**µCi/mL**	**%**	**Ci**	**µCi/g**	**%**	**Ci**	**Ci**
Total alpha	< 0.00810	N/A	< 21.0	0.358	24.0	928	949
Total beta	---	---	---	603	14.4	1.56E+06	
^{241}Am	---	---	---	< 4.43	N/A	< 11,500	< 11,500
^{137}Cs	---	---	---	131	10.3	3.40E+05	3.40E+05
^{60}Co	---	---	---	< 0.190	N/A	< 493	< 493
^{154}Eu	---	---	---	< 0.557	N/A	< 1,440	< 1,440
^{155}Eu	---	---	---	< 1.06	N/A	< 2,750	< 2,750
$^{89/90}$Sr	---	---	---	252[2]	19.6	6.53E+05	6.53E+05

Table 4-2. Solid and Liquid Chemical Data Summary for Tank 241-S-101. (4 Sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solids Concentration	Solids RSD (Mean)	Solids Inventory	Total Inventory
Total Carbon	**µg C/mL**	**%**	**kg**	**µg C/g**	**%**	**kg**	**kg**
Total inorganic carbon	---	---	---	3,760[2]	58.3	9,750	9,750
Total organic carbon	---	---	---	1,990[2]	57.3	5,160	5,160
PHYSICAL PROPERTIES	**Mean Liquid Concentration**	**Liquid RSD (Mean)**	**Liquid Inventory**	**Mean Solid Result**	**Solids RSD (Mean)**	**Solids Inventory**	**Total Inventory**
Weight percent water	53.1 %	1.0 %	32,500 kg	40.2 %	3.5 %	1.04E+06 kg	1.07E+06 kg
Density/ specific gravity	1.36	0.7 %		1.65 g/mL	2.0 %		

Notes:

N/A = not applicable
--- = not analyzed

[1]Mean is from samples prepared by the fusion method, while all other metal results are from the acid digestion data.

[2]Mean is reported from core composite results.

4.1.2 Physical Data Summary

Thermal analyses were performed on the tank 241-S-101 samples to satisfy the requirements of the safety screening DQO (Dukelow et al. 1995) and the historical DQO (Simpson and McCain 1995), which dictated that TGA and DSC be performed on the samples. Density determinations were also performed on the samples as mandated by the DQOs.

4.1.2.1 Thermogravimetric Analysis. In a TGA, the mass of a sample is measured while its temperature is increased at a constant rate. Nitrogen is passed over the sample during the heating to remove any released gases. Any decrease in the weight of a sample 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 °C [302 °F]) is due to water evaporation. Weight percent water by TGA was performed by the 222-S Laboratory using procedures LA-560-112, Rev. B-1 (Mettler™) or LA-514-114, Rev. C-1 (Perkin-Elmer™).

The TGA percent water data for tank 241-S-101 are presented in Table A-57 of Appendix A. The overall mean percent water for the solids, other than those of the composites, was 40.2 weight percent, while the liquid overall mean was 53.1 weight percent.

4.1.2.2 Differential Scanning Calorimetry. In a DSC analysis, heat absorbed or emitted by a substance is measured while the substance is heated at a constant rate of temperature. While the substance is being heated, a gas such as nitrogen is passed over the waste material to remove any gases being released. The onset temperature for an endothermic (characterized by or causing the absorption of heat) or exothermic (characterized by or causing the release of heat) event is measured with thermocouples and displayed graphically. Analyses by DSC were performed by the 222-S Laboratory using either procedure LA-514-113, Rev. C-1 (Mettler™) or LA-514-114, Rev. C-1 (Perkin-Elmer™).

The DSC results are presented in Table A-56 of Appendix A. The sample weight, temperature at maximum enthalpy change, and the magnitude of the enthalpy change are provided for each transition. Four samples exhibited exothermic transitions. One sample was a liner liquid. Because exothermic reactions are associated with negative enthalpy changes, they have been denoted in Table A-56 with a negative sign. All results reported in the table are on a wet weight basis.

For a comparison of the exothermic enthalpy changes with the decision limit of -480 J/g, the exothermic values were converted to a dry weight basis using the respective sample weight percent water. After conversion to a dry weight basis, it was determined that none of the samples exhibited enthalpy changes exceeding the -480 J/g limit. The upper limit to the one-sided 95 percent confidence intervals on the mean were calculated with, the largest sample result being -310 J/g.

Table 4-3 presents the three samples that had exothermic reactions, along with the weight percent water for conversion to a dry weight, the converted exothermic value, and the upper limits of the 95 percent confidence intervals.

Table 4-3. DSC Exothermic Results and 95 Percent Confidence Interval Upper Limits.[1]

Core: Segment	Sub-Segment	Run	Wet Wt. ΔH J/g	Sample Wt% Water %	Dry Wt. ΔH J/g	Mean J/g	95% Confidence Interval Upper Limits J/g
142:2	Upper ½	1	-21.4/ -42.8[2]	44.7	-116.1	-95.4	-226
		2	-7.6/ -33.7[2]		-74.7		
	Lower ½	1	-64.3	42.8	-112	-93.6	-210
		2	-7.0/ -36.0[2]		-75.2		
142:4	Upper ½	1	-10.9	40.1	-18.2	-9.1	-66.6
		2	0		0		

Notes:

[1]Fritts (1996)

[2]The exothermic reactions for this sample came from the third transition. All other results are from the second transition.

4.1.2.3 Density/Specific Gravity. Bulk density measurements were performed on solid samples using procedure LO-160-103, Rev. B-0. Specific gravity measurements were performed on the liquid samples using procedure LA-510-112, Rev. C-3. The mean density of the solids was 1.65 g/mL and the mean specific gravity of the liquid was 1.36. The analytical data are presented in Table A-58 of Appendix A.

4.1.3 Tank Headspace Flammability

As discussed in Section 3.1, sampling of the tank 241-S-101 headspace was performed prior to core sampling. The safety screening DQO decision limit for flammable gas concentration is 25 percent of the LFL (Dukelow et al. 1995). The combustible gas meter used for the sampling event reports results as a percentage of the lower explosive limit (LEL). Because the National Fire Protection Association defines the terms LFL and LEL identically, the two terms are used interchangeably (NFPA 1995). Sampling was done in the headspace through risers 7 and 9 between February 6 and February 21, 1996. The maximum value recorded in the headspace under risers 4 and 6 was 7 percent of the LEL, indicating no flammability concerns. During the flammable gas monitoring, the maximum concentrations of oxygen (20.8 percent), total organic vapor (31 ppm), and ammonia (600 ppm) were also measured (Fritts 1996).

4.1.4 Wash Water Contamination Check

The wash water used during sampling operations contained a known concentration of lithium bromide. Through chemical analyses for lithium and bromide, as prescribed by the SAP (Kruger 1996), contamination of the samples by the wash water could be estimated. The results indicated that there was only a small amount of contamination in one of the samples. No adjustments to the TGA results were necessary. The analytical data for lithium and bromide are presented in Appendix B. An overall mean and tank inventory were not calculated for these two analytes because they are not constituents of the tank waste.

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5.0 INTERPRETATION OF CHARACTERIZATION RESULTS

The purpose of this chapter is to discuss the overall quality and consistency of the current sampling results for tank 241-S-101, and to assess and compare these results against historical information and program requirements.

5.1 ASSESSMENT OF SAMPLING AND ANALYTICAL RESULTS

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

5.1.1 Field Observations

The safety screening DQO (Dukelow et al. 1995) requirement that at least two widely spaced risers be sampled was fulfilled. The requirement for vertical profiling was met, but not without difficulty. The requirement for vertical profiling was met, but not without difficulty. Segments 1 through 4 of core 138 initially had zero sample recovery and were resampled with similar results. The resampling of segment 1 provided drainable liquid, but no solids. Segment 2 was resampled twice more and on the last attempt provided drainable liquid and a small amount of solids. Segment 3 was also resampled twice. The first resampling recovered drainable liquid, while the last attempt recovered a small amount of solids. No sample was recovered from the resampling of segment 4. No anomalies were reported during extrusion.

5.1.2 Quality Control Assessment

The usual quality control assessment includes an evaluation of the appropriate standard recoveries, matrix spike recoveries, duplicate analyses, and blanks that are performed in conjunction with the chemical analyses. All the pertinent quality control tests were conducted on the 1996 core samples, allowing a full assessment regarding the accuracy and precision of the data. The specific criteria for all QC checks were given in the SAP (Kruger 1996). Quality control results outside these criteria are identified by superscripts in the Appendix A tables.

The standard and matrix 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, then the analytical results may be biased high or low, respectively. The analytical precision is evaluated by the relative percent difference (RPD), which is defined as the absolute value of the difference between the primary and duplicate samples, divided by their mean, multiplied by one hundred.

All standard and matrix spike recoveries were within the SAP defined limits with the exception of high matrix spike recoveries for sodium. The high recoveries are not expected to affect the data. When the sample concentration is greater than the spike concentration by a factor of four or more, the matrix spike recovery should be evaluated with caution. The laboratory encountered calibration problems during the nitrite analysis of samples from core 138. Because nitrite was not a required analyte per the SAP, the affected samples were not reanalyzed, and only nitrate data from segments 2R1 and 5 were reported. Three TGAs had RPD results outside the SAP specified limits. The samples were reanalyzed with duplicates producing acceptable results. Three other samples had RPDs between 17 and 20 percent. Two of these had triplicate analyses affected and the spread in the data was lessened. As 20 percent is the specified limit the calculated value for the third sample is reported. Four of the total alpha activity RPDs were outside the defined limits. No sample reanalyses were requested because the poor precision was attributed to low sample activity and data well below the decision criterion. Several analytes were determined by IC and ICP with RPDs outside the defined limits. The high RPDs for these analytes were attributed to sample inhomogeneity.

Finally, none of the samples exceeded the criterion for preparation blanks; thus, contamination was not a problem for any of the analyses. In summary, the majority of the QC results were within the boundaries specified in the SAP. Although a few were outside their target levels, they were not found to substantially impact either the validity or the use of the data.

5.1.3 Data Consistency Checks

Comparisons of results from different analytical methods can help assess the consistency and quality of the data. Checks can be made on some analytes when the same aliquot of sample is analyzed by two comparable analyses, or when two different methods were used to prepare the sample before analysis. The comparisons are limited because sampling effects caused by sample heterogeneity cannot be separated from differences in the methods. The calculation of mass and charge balances, along with comparisons of the ICP phosphorous and sulfur results with the IC phosphate and sulfate results, respectively. Only the solid portion of the waste was considered in these comparisons because it comprises 93 percent of the total waste.

5.1.3.1 Comparison of Results from Different Analytical Methods. The following data consistency checks compare the results from two different analytical methods. A close comparison strengthens the credibility of both results, whereas a poor comparison brings the reliability of the data into question. All analytical mean results were taken from Table 4-2.

The analytical phosphorous mean by ICP was 1,400 μg/g, which represents total phosphorous. This amount of phosphorous converts to 4,290 μg/g of phosphate. The IC phosphate result was 3,680 μg/g (ratio of 1.17). The ICP sulfur value of 1,960 μg/g, which represents total sulfur, is equivalent to 5,880 μg/g of sulfate. The IC result for sulfate was 7,250 μg/g (ratio of 0.811). The sulfur results are contradictory to expected behavior. Because ICP measures total sulfur, its result is usually larger than or equal to the IC value, which is a measurement of the soluble sulfate. A possible explanation for the unexpected results is that some metal sulfates are insoluble in acid and more soluble in basic media. It is possible that the water leach performed prior to the IC analysis dissolved more of the sulfate than the acid digestion done before the ICP analysis.

5.1.3.2 Mass and Charge Balances. The principle objective in performing mass and charge balances is to determine if the measurements were consistent. In calculating the balances, only analytes listed in Table 4-2 detected at a concentration of 1,500 μg/g or greater were considered.

Except sodium, all cations listed in Table 5-1 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 sodium. The anionic analytes listed in Table 5-2 were assumed to be present as sodium salts and were expected to balance the positive charge. Phosphorous and sulfur are assumed to be present as soluble phosphate and sulfate ions. The concentrations of cationic species in Table 5-1, the anionic species in Table 5-2, and the percent water were ultimately used to calculate the mass balance. The uncertainty estimates (RSDs) associated with each analyte are also given in the tables. The uncertainty estimates for the cation and anion totals, as well as the overall uncertainty given in Table 5-3, were computed by a statistical technique known as the propagation of errors (Nuclear Regulatory Commission 1988).

The mass balance was calculated from the formula below. The factor 0.0001 is the conversion factor from μg/g to weight percent, AlO(OH) is the assumed species. There was no endotherm reported in the DSC analysis at *ca.* 330 °C (626 °F). Additionally, there is a difference between the measured values for Al concentration between the two preparation techniques. The AlO(OH) form is consistent with both of these observations.

$$\begin{aligned}\text{Mass balance} &= \text{percent Water} + 0.0001 \times \{\text{Total Analyte Concentration}\} \\ &= \text{percent Water} + 0.0001 \times \{AlO(OH) + Cr(OH)_3 + MnO(OH) + \\ &UO_3 + Na^+ + Cl^- + NO_3^- + NO_2^- + CO_3^{2-} + C_2O_4^{2-} + C_2H_3O_2^- + \\ &PO_4^{3-} + SO_4^{2-}\}.\end{aligned}$$

The total analyte concentrations calculated from the above equation is 605,000 μg/g (wet weight). The mean weight percent water obtained from thermogravimetric analysis reported in Table 4-2 is 40.2 percent, or 402,000 μg/g. The mass balance resulting from adding the percent water to the total analyte concentration is 101 percent (Table 5-3).

The following equations demonstrate the derivation of total cations and total anions, and the charge balance is the ratio of these two values. To derive the results as shown in the equations, all concentrations must first be converted to a μg/g basis.

Total cations (μeq/g) = $[Na^+]/23.0 = 6{,}480\ \mu eq/g$

Total anions (μeq/g) = $[Cl^-]/35.5 + [CO_3^{2-}]/30.0 + [C_2O_4^{2-}]/44.0 + [C_2H_3O_2^-]/59.0 + [NO_3^-]/62.0 + [NO_2^-]/46.0 + [PO_4^{3-}]/31.7 + [SO_4^{2-}]/48.0 = 4{,}880\ \mu eq/g.$

The charge balance obtained by dividing the sum of the positive charge by the sum of the negative charge was 1.33.

Table 5-1. Cation Mass and Charge Data.[1]

Analyte	Concentration (wet weight)	Assumed Species	Concentration of Assumed Species	RSD (Mean)	Charge
	μg/g		μg/g	%	μeq/g
Aluminum	80,500[2]	AlO(OH)	179,000	14.7	0
Chromium	7,250	$Cr(OH)_3$	14,400	20.5	0
Manganese	1,540	MnO(OH)	2,460	17.8	0
Uranium	4,680	UO_3	5,620	23.9	0
Sodium	149,000	Na^+	149,000	4.8	6,480
Total			350,000	7.8	6,480

Note:

[1]The results are from ICP samples prepared by acid digestion.

[2]This result is from ICP samples prepared by fusion.

Table 5-2. Anion Mass and Charge Data.

Analyte	Concentration (wet weight)	Assumed Species	Concentration of Assumed Species	RSD (Mean)	Charge
	µg/g		µg/g	%	µeq/g
Chloride	3,460	Cl^-	3,460	9.5	97
Nitrate	162,000	NO_3^-	162,000	25.1	2,610
Nitrite	49,200	NO_2^-	49,200	8.4	1,070
Oxalate	5,700	$C_2O_4^{2-}$	5,700	44.7	130
Phosphate	3,680	PO_4^{3-}	3,680	56.3	116
Sulfate	7,250	SO_4^{2-}	7,250	46.1	151
TIC*	3,760[1]	CO_3^{2-}	18,800	58.3	627
TOC**	1,990[1]	$C_2H_3O_2^-$	4,890	57.3	83
Total			255,000	16.7	4,880

Note:
[1]Results are from core composite data.

Table 5-3. Mass Balance Totals.

Totals	Concentrations	RSD (Mean)
	µg/g	%
Total from Table 5-1	350,000	7.8
Total from Table 5-2	255,000	16.7
Water %	402,000	3.5
Grand Total	1,010,000	5.2

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

5.1.3.3 Gross Beta and Sum of the Beta Emitters. Limited comparison was made between the gross beta activities with the sum of the individual beta emitters. Selected composite data was available to perform this comparison. Because of the sampling and analytical direction, total alpha, $^{239/240}Pu$ (and other alpha emitters), and total beta measurements were not gathered on each sample. However, some composite results are available. For selected comparisons on the composite level results, see Table 5-4.

The activities of the individual beta emitters were summed as follows:

$$\text{Sum of beta emitters} = (2 * {}^{90}\text{Sr}) + {}^{137}\text{Cs}$$

Because ^{90}Sr is in equilibrium with its daughter product ^{90}Y, the radiochemically measured value for ^{90}Sr alone must be multiplied by 2 to obtain numbers comparable with total beta. The slight amount of ^{60}Co detected was considered negligible in this calculation.

Table 5-4. Comparison of Gross Beta Measurements and Individual Beta Emitters.

Core Composite	^{137}Cs concentration (µCi/g)	^{90}Sr concentration (µCi/g)	Sum of Beta Emitters (µCi/g)	Gross Beta concentration (µCi/g)	RPD (%)
138	118	302	722	689	4.7
142	150	203	556	516	7.5

5.2 COMPARISON OF HISTORICAL WITH ANALYTICAL RESULTS

Prior to the 1996 sampling event, the most recent sampling of tank 241-S-101 occurred in December 1991. No specific information regarding sample type, sample depth, or number of samples was given. The sample was described as being clear yellow in color did not match the descriptions of the drainable liquid in the 1996 samples, which were given as green and opaque. A comparison between this sampling event and the drainable liquid results from the current sampling event appears in Table 5-5. Only four analytes could be compared. Aluminum, nitrate, and nitrite results compared well between the two events, while fluoride compared poorly. Due to the differences in physical appearance, this comparison should be used with caution. The results from several pre-1991 sampling events are reported in Appendix C for informational purposes only.

Table 5-5. Comparison of Data from the 1991 and 1996 Sampling Events.[1,2]

Analyte	1991 Analytical Result µg/mL	1996 Analytical Result µg/mL
Aluminum	15,600	24,500
Fluoride	6,640	< 106
Nitrate	1.97E+05	1.81E+05
Nitrite	96,600	94,000

Note:
[1]WHC (1991)
[2]Fritts (1996)

5.3 TANK WASTE PROFILE

According to the estimate of Hanlon (1996), the 413 cm (163 in.) of waste in tank 241-S-101 was expected to consist of 45 kL (12 kgal) of supernatant overriding 647 kL (171 kgal) of saltcake and 924 kL (244 kgal) of sludge. The saltcake and sludge layers include 318 kL (84 kgal) of drainable interstitial liquid. This estimate differed from the TLM estimate (Figure 2-3), which divided the waste into 314 kL (83 kgal) of saltslurry, 799 kL (211 kgal) of saltcake, and 458 kL (121 kgal) of sludge.

The visual descriptions of the samples indicated that the segments were similar in texture and color. The predominate colors of the segments were black, gray, and brown, while the texture of the segments varied from wet sludge to damp sludge. The waste descriptions between cores were generally consistent, although drainable liquid was only found in the first three segments of core 138. The photographic montage of the waste surface showed the waste in the center of the tank to be a dark brown sludge, while the surface around the perimeter of the tank resembled saltcake. Based on the predictions by Hanlon (1996) and the TLM, and the physical descriptions of the segments, the tank waste appears to be somewhat heterogeneous.

5.3.1 Analysis of Variance Results

Random effects statistical ANOVA (analysis of variance) models were fit to concentration data from the core/segment samples. The results from these models can be used, on an analyte by analyte basis, to judge the vertical and horizontal variability in mean analyte concentration. Statistical results from these models are univariate results. Multivariate statistical results are outlined in the next section.

Two types of nested random effects ANOVA models were used. One random effects model was fit to core composite data; another was fit to core/segment data. The latter random effects model was fit to three subsets of the data: saltcake data and sludge data, and combined saltcake and sludge data. The ANOVA models were fit to analyte concentration data, provided, at least 50 percent the measurements were above the detection limits. For these analytes, the detection limit was used as the measured concentration. Consequently, the summary statistics for these analytes are biased. The magnitude of the bias cannot be estimated.

For each analyte, estimates of mean concentrations and RSDs of the mean were obtained using restricted maximum likelihood (REML) methods. Appendix A contains the details and the results from the ANOVA. In addition to estimates of the mean and RSDs of the mean, Appendix A contains estimates of the standard deviation of the mean, the upper limit to the one-sided 95 percent confidence intervals on the mean, estimates of the variance components used to measure horizontal and vertical variability and the p-values associated with the F-tests.

The p-values, associated with the F-tests from the ANOVA, are compared to a standard significance level ($\alpha = 0.05$). If it is less than 0.05, the analyte means are significantly different from each other. If a p-value is greater than 0.05, the analyte means are not significantly different from each other. The p-value is used to determine the significance of horizontal and vertical variability within the waste. The results are on an analyte by analyte basis.

The results from the ANOVA were mixed. There were 85 analytes in the sampled solids data. There were significant differences in the mean concentrations between core samples for 1 (1 percent) of the analytes and significant differences in mean concentrations between segments for 22 (26 percent) of the analytes. There were significant differences in the mean concentrations between subsegments for 28 (33 percent) of the analytes. This suggests that for the solids, there is vertical variability within the waste, but little evidence of horizontal variability.

For the core composite data (84 analytes), there were significant differences in the mean concentrations between core samples for 18 (21 percent) of the analytes. That is, based on core composite data, there is horizontal variability within the waste.

For the liquid data (43 analytes), there were significant differences in the mean concentrations between segments for 10 (23 percent) of the analytes. That is, based on core composite data, there is vertical variability within the waste.

The general conclusion from the ANOVA models is that there is vertical variability within the waste. There is marginal evidence for horizontal variability, which can be attributed by simple filling and cascading modelling.

5.4 COMPARISON OF TRANSFER HISTORY WITH ANALYTICAL RESULTS

The HTCE prediction for the contents of tank 241-S-101 are shown in Table 5-6 along with the analytical results from the solid portion of the 1996 core sampling event. Because the HTCE has not been validated, the comparison is for information purposes only. These results should be used with caution.

Comparing the HTCE with the analytical values gives varied results. Some analytes are reasonably close in their estimates, while others are very different. Specifically, 12 of 18 comparisons were approximately the same order of magnitude.

Table 5-6. Comparison of Historical Estimates with the 1996 Analytical Results for Tank 241-S-101.[1,2] (1 Sheet)

Analyte	HTCE Estimate	1996 Analytical Result
METALS	**µg/g**	**µg/g**
Aluminum	47,300	80,500
Calcium	2,290	329[3]
Chromium	9,130	7,250
Iron	8,860	1,360
Manganese	61.9	1,540
Potassium	797	926[3]
Sodium	1.21E+05	1.49E+05
Uranium	4,710	4,680[3]
ANIONS	**µg/g**	**µg/g**
Chloride	2,840	3,460
Nitrate	1.38E+05	1.62E+05
Nitrite	58,300	49,200
Phosphate	2,390	3,680
Sulfate	7,420	7,250
Oxalate	0.709	5,700
Acetate	124	4,890[4]
Carbonate	10,300	18,800[5]
PHYSICAL PROPERTIES		
Bulk Density	1.49 g/mL	1.65 g/mL
Water	45.8 %	40.2 %

Notes:

[1]Agnew et al. (1996a)
[2]Fritts (1996)
[3]The results are from samples prepared by acid digestion, while all other metal results are from the fusion digestion data.
[4]Calculated from the core composite results for TOC.
[5]Calculated from the core composite results for TIC.

5.5 EVALUATION OF PROGRAM REQUIREMENTS

The March and April 1996 core sampling event was governed by two DQOs. The safety screening DQO (Dukelow et al. 1995) is used to assess the safety of the tank waste and to evaluate the tank for placement on a Watch List or to verify current Watch List status. The historical DQO (Simpson and McCain 1995) attempts to acquire information through selective tank sampling to quantify the errors associated with the historical model predictions for the waste composition. A discussion of the specific requirements of these DQOs and a comparison of the analytical results to defined concentration limits is presented in this section. Section 5.5.1 details the safety evaluations required by the safety screening DQO, while Section 5.5.2 presents the historical model evaluation.5.5.1 Safety Evaluation

5.5.1 Safety Evaluation

Data criteria identified in the safety screening DQO are used to identify any unknown safety issues and to evaluate the tank for placement on or removal from a Watch List. Of the five primary analyses required by the DQO, three have decision criteria thresholds which, if exceeded, could warrant further investigation to ensure tank safety. These three analyses include DSC to evaluate fuel content energetics, a determination of total alpha activity to evaluate the criticality potential, and a measurement of the flammability of the tank headspace gases. In addition, the historical DQO required core composite samples to be analyzed for TOC. Table 5-7 lists the applicable safety issues, decision variables and thresholds, and the mean analytical results from the 1996 sampling event.

Table 5-7. Decision Variables and Criteria for the Safety Screening and Historical Data Quality Objectives. (2 sheets)

Issue	Primary Decision Variable	Decision Criteria Threshold	Mean Analytical Result
Ferrocyanide/ Organics	Total fuel content/energetics	-480 J/g[1]	No samples exceeded limit; highest upper limit to a one-sided 95 percent confidence interval on the mean = -226 J/g[1]
Organic	Total organic carbon	30,000 μg/g[1]	No samples exceeded limit; highest upper limit to a one-sided 95 percent confidence interval on the mean = 5,720 μg C/g[1,2]

Table 5-7. Decision Variables and Criteria for the Safety Screening and Historical Data Quality Objectives. (2 sheets)

Issue	Primary Decision Variable	Decision Criteria Threshold	Mean Analytical Result
Criticality	Total alpha activity	Solids: 34.2 μCi/g Liquids: 61.5 μCi/mL	No samples exceeded limit; highest upper limit to a one-sided confidence interval on the mean for the solids was 2.00 μCi/g. The mean liquid result was < 0.00810 μCi/mL
Flammability	Flammable gas	25 % of the LFL	7 % of the LFL[3]

Note:

[1]Value is reported on a dry weight basis.
[2]Result is from the core composite data.
[3]Highest recorded value.

The safety screening DQO has established a decision threshold of -480 J/g (dry weight basis) for the DSC analyses; for comparison to this limit, all analytical results were first converted to a dry weight basis. All exothermic results were below the decision threshold, with the highest upper limit to a one-sided 95 percent confidence interval on the mean being -226 J/g.

The potential for criticality can be assessed from the total alpha activity data. The safety screening decision threshold is 1 g/L, which converts to 34.2 μCi/g for the solids using the highest density of 1.80 g/mL, or 61.5 μCi/mL for the liquids. The calculated overall mean for the solids portion of the tank was 0.358 μCi/g, while the overall mean for the liquid portion was < 0.00810 μCi/mL. All results were below the decision threshold, for the solids with the highest upper limit to a one-sided 95 percent confidence interval on the mean being 2.00 μCi/g.

The TOC content of the tank was measured, through the analysis of core composites, as required by the historical DQO. All TOC results were well below the decision threshold of 30,000 μg C/g (dry weight basis) as outlined in the SAP (Kruger 1996). The overall mean TOC result for the core composites was 3,390 μg C/g, while the highest 95 percent confidence interval upper limit was 5,720 μg C/g.

The flammability of the gas in the tank headspace is an additional safety screening DQO consideration. The notification limit for flammable gas concentration is 25 percent of the LFL. The highest combustible gas meter reading was 7 percent of the LFL. Additional measurements were taken for ammonia (600 ppm), oxygen (20.8 percent), and total organic vapor (31 ppm).

Another factor in assessing tank safety is the heat generation and temperature of the waste. Heat is generated in the tanks from radioactive decay. The total tank heat load estimate from radionuclide data was 5,970 W (20,400 Btu/hr) and was calculated as shown in Table 5-8. The HTCE prediction was 5,010 W (17,100 Btu/hr) (Agnew et al. 1996a), while an estimate based on the tank headspace temperature was 4,020 W (13,700 Btu/hr) (Kummerer 1994). All of the estimates are well below the 11,700-W (40,000-Btu/hr) operating specification limit for single-shell tanks (Bergmann 1991). Because an upper temperature limit has been exhibited (Section 2.4.3), it may be concluded that any heat generated from radioactive sources throughout the year is dissipated.

Table 5-8. Tank 241-S-101 Projected Heat Load.

Radionuclide	μCi/g	Ci	Watts
^{137}Cs	131[1]	3.40E+05	1,600
$^{89/90}Sr$	252[1]	6.53E+05	4,370
Total		9.93E+05	5,970

Note:
[1]Mean is from core composite results.

5.5.2 Historical Model Evaluation

The primary objective of the historical DQO (Simpson and McCain 1995) is to acquire information through selective tank sampling to quantify the errors associated with predicting tank waste composition based on waste transaction history and waste type compositions. The historical DQO identifies tank 241-S-101 as spatially complex in nature. Therefore, because a specific waste type could not be evaluated through segment comparisons, core composites were used to evaluate the HTCE predictions. Core composites are compared to the HTCE predictions in Table 5-9. If the analytical results are ≥ 10 percent of the HTCE levels (ratio of 0.1 or more), the HTCE predictions are considered acceptable (Simpson and McCain 1995). All of the required comparisons were above the required ratio of 0.1, indicating that, at this level of evaluation, the HTCE predictions are valid. Interesting to note is the oxalate ratio. It has been observed that acetate, EDTA, HEDTA, and citrate contribute to the energetics of the waste. Oxalate has been proposed as a decomposition product from aging of some of the organic forms in the waste.

Table 5-9. Comparison of Historical Tank Content Estimates with Mean Core Composite Results from Tank 241-S-101.[1,2]

Analyte	Mean Core Composite Result	HTCE Estimate	Ratio
METALS	**µg/g**	**µg/g**	
Aluminum	88,900	47,300	1.88
Calcium	435[3]	2,290	0.190
Chromium	5,230	9,130	0.573
Iron	1,200	8,860	0.135
Manganese	1,700	61.9	27.5
Nickel	3,350	665	5.04
Potassium	880[3]	797	1.10
Silicon	2,350	1,220	1.93
Sodium	1.91E+05	1.21E+05	1.58
Uranium	5,190[3]	4,710	1.10
ANIONS	**µg/g**	**µg/g**	**Ratio**
Chloride	3,260	2,840	1.15
Nitrate	1.35E+05	1.38E+05	0.978
Nitrite	45,000	58,300	0.772
Phosphate	4,020	2,390	1.68
Sulfate	6,270	7,420	0.845
Oxalate	3,940	0.709	5,560
Acetate	4,890[4]	124	39.4
Carbonate	18,800[5]	10,300	1.83
PHYSICAL PROPERTIES	**Mean Core Composite Result**	**HTCE Estimate**	**Ratio**
Bulk Density	1.65 g/mL	1.49 g/mL	1.11
Water	38.4 %	45.8 %	0.838

Notes:

[1]Agnew et al. (1996a)
[2]Fritts (1996)
[3]Results are from samples prepared by acid digestion, while the remaining metals were prepared by the fusion method.
[4]Calculated from TOC.
[5]Calculated from TIC.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

The waste in tank 241-S-101 was core sampled in March/April 1996 in accordance with *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995), and *Strategy for Sampling Hanford Site Tank Wastes for Development of Disposal Technology* (Kupfer et al. 1995). This sampling effort involved taking push-mode core samples of the tank waste from three different risers. The sampling and analyses were performed in accordance with *Tank 241-S-101 Push Mode Core Sampling and Analysis Plan* (Kruger 1996). All analyses on core 138 and core 142 were performed at the Westinghouse Hanford Company 222-S Laboratory. Samples from core 137 were composited and a subsample sent to the Pretreatment Program to fulfill the SAP requirements.

Comparisons were made between the analytical results and the decision thresholds given in the DQOs. The safety screening DQO has established a decision threshold on exotherms of -480 J/g (dry weight basis) for the DSC analyses; for comparison to this limit, all analytical results were first converted to a dry weight basis. All exothermic results were below the decision threshold, with the highest upper limit to a one-sided 95 percent confidence interval on the mean being -226 J/g. All of the TOC results were below the decision limit of 30,000 μg C/g (dry weight basis). The overall mean TOC result for the core composites was 3,390 μg C/g, while the highest upper limit to a one-sided 95 percent confidence interval on the mean was 5,720 μg C/g. The overall solids mean for total alpha activity was 0.358 μCi/g, while the overall liquid mean was $<$ 0.00810 μCi/mL. All results were below the decision threshold (34.2 μCi/g for the solids and 61.5 μCi/mL for the liquids), with the highest upper limit to a one-sided 95 percent confidence interval on the mean for the solids being 2.00 μCi/g. Finally, the highest flammable gas reading in the tank headspace was 7 percent of the LFL.

The total tank heat load estimate from radionuclide data was 5,970 W (20,400 Btu/hr). The HTCE prediction was 5,010 W (17,100 Btu/hr) (Agnew et al. 1996a), while an estimate based on the tank headspace temperature was 4,020 W (13,700 Btu/hr) (Kummerer 1994). All estimates are very similar and comparable, and well below the 11,700 W (40,000 Btu/hr) operating specification limit for single-shell tanks (Bergmann 1991). Because the tank exhibits an upper temperature limit, it may be concluded that any heat generated from radioactive sources throughout the year is dissipated.

Finally, several conclusions were drawn from the analytical results. Based on the decision criteria of the safety screening DQO, this tank may be categorized as "safe." The waste in tank 241-S-101 may continue to be safely stored in the tank without special action. There were no unexpected findings that could affect the ability to retrieve and dispose of the waste safely. In addition, no further characterization efforts are needed at this time.

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7.0 REFERENCES

Agnew, S. F., J. Boyer, R. Corbin, T. Duran, J. Fitzpatrick, K. Jurgensen, T. Ortiz, and B. Young, 1996a, *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 3*, LA-UR-96-858, Rev. 0, Los Alamos National Laboratory, Los Alamos, New Mexico.

Agnew, S. F., P. Baca, R. Corbin, T. Duran, and K. Jurgensen, 1996b, *Waste Status and Transaction Record Summary for the Southwest Quadrant*, WHC-SD-WM-TI-614, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Alstad, A. T., 1993, *Riser Configuration Document for Single-Shell Waste Tanks*, WHC-SD-RE-TI-053, Rev. 9, Westinghouse Hanford Company, Richland, Washington.

ARHCO, 1975, *101-S Tank Arrangement As Built*, Drawing H-2-37524, Rev. 0, Atlantic Richfield Hanford Company, Richland, Washington.

Bergmann, L. M., 1991, *Single-Shell Tank Isolation Safety Analysis Report*, WHC-SD-WM-SAR-006, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Brevick, C. H., L. Gaddis, and A. Walsh, 1994, *Supporting Document for the Historical Tank Content Estimate for S Tank Farm*, WHC-SD-WM-ER-323, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

De Lorenzo, D. S., A. T. DiCenso, D. B. Hiller, K. W. Johnson, J. H. Rutherford, D. J. Smith, and B. C. Simpson, 1994, *Tank Characterization Reference Guide*, WHC-SD-WM-TI-648, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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.

Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Fritts, L. L., 1996, *Final Results for Tank 241-S-101, Push Mode Cores 137, 138, and 142*, WHC-SD-WM-DP-185, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Hanlon, B. M., 1996, *Waste Tank Summary Report for Month Ending April 30, 1996*, WHC-EP-0182-97, Westinghouse Hanford Company, Richland, Washington.

Horton, J. E., 1975, *Analysis and Characterization of Sludge from Tank 101-S*, (internal letter to W. R. Christensen, July 16), Atlantic Richfield Hanford Company, Richland, Washington.

Kruger, A. A., 1996, *Tank 241-S-101 Push Mode Core Sampling and Analysis Plan*, WHC-SD-WM-TSAP-078, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

Kummerer, M., 1994, *Topical Report on Heat Removal Characteristics of Waste Storage Tanks*, WHC-SD-WM-SARR-010, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Kupfer, M. J., W. Schulz, and J. Slankas, 1995, *Strategy for Sampling Hanford Site Tank Wastes for Development of Disposal Technology*, WHC-SD-WM-TA-154, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Leach, C. E., and S. Stahl, 1996, *Hanford Site Tank Farm Facilities Interim Safety Basis*, WHC-SD-WM-ISB-001, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

Lipnicki, J., 1996, *Waste Tank Risers Available for Sampling*, WHC-SD-WM-TI-710, Rev. 3, Westinghouse Hanford Company, Richland, Washington.

NFPA, 1995, *National Fire Codes*, Vol. 10, Section 115, "Laser Fire Protection", National Fire Protection Association, Quincy, Massachusetts.

Nuclear Regulatory Commission, 1988, *Statistical Methods for Nuclear Materials Management*, NUREG-CR-4604, PNL-5849, (C. A. Bennett and W. M. Bowen eds.), U.S. Government Printing Office, Washington, D.C.

Puryear, D. A., 1971, *Characterization of S, U, and SX Waste Tanks*, (internal letter to J. O. Skolrud, September 21), Atlantic Richfield Hanford Company, Richland, Washington.

Rutherford, M. J., 1949, *Specifications for Construction of Waste Disposal Facilities, 241-S, 216-S, 207-S, 200 West Area, Hanford Works*, Specification No. HW 3937, General Electric Company, Richland, Washington.

Simpson, B. C., and D. McCain, 1995, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-018, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Tran, T. T., 1993, *Thermocouple Status Single Shell & Double Shell Waste Tanks*, WHC-SD-WM-TI-553, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Vitro Engineering Corporation, 1980, *Piping Waste Tank Isolation TK-241-S-101*, Drawing H-2-73181, Rev. 0, Vitro Engineering Corporation, Richland, Washington.

WHC, 1991, *Sample Status Report for T-8579*, December 30, Tank Characterization Resource Center, Tank S-101, Item 6, Westinghouse Hanford Company, Richland, Washington.

WHC, 1996, SACS: Surveillance Analysis Computer System, In: SYBASE/Visual Basic [Mainframe], Available: Hanford Local Area Network (HLAN), Westinghouse Hanford Company, Richland, Washington; or Tank Waste Information Network System (TWINS), Battelle - Pacific Northwest National Laboratory.

Wheeler, R. E., 1974, *Analysis of Tank Farm Samples, Sample T8084, Tank 101-S*, (internal letter to R. L. Walser, December 20), Atlantic Richfield Hanford Company, Richland, Washington.

Wheeler, R. E., 1975, *Analysis of Tank Farm Samples, Sample T9715, Tank 101-S*, (internal letter to R. L. Walser, December 5), Atlantic Richfield Hanford Company, Richland, Washington.

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APPENDIX A

ANALYTICAL RESULTS FROM 1996 CORE SAMPLING

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A.0 ANALYTICAL RESULTS FROM 1996 CORE SAMPLING AND 1995 GRAB SAMPLING

A.1 INTRODUCTION

Appendix A reports the chemical, radiochemical and physical characteristics of tank 241-S-101 in table form and in terms of the specific concentrations of metals, ions, radionuclides, and physical properties.

Each data table lists the following: laboratory sample identification, sample origin (core/segment/subsegment), an original and duplicate result for each sample, a sample mean, an overall mean for the tank, an RSD (mean), and a projected tank inventory for the particular analyte using the weighted mean and the appropriate conversion factors. Projected tank inventory is not applicable to the percent water, DSC, or density data. The data are listed in standard notation for values greater than 0.001 and less than 100,000. Values outside these limits are listed in scientific notation.

The tables are numbered A-1 through A-58. A description of the units and symbols used in the analyte tables and the references used in compiling the analytical data (Fritts 1996) are found in the List of Terms and Section 7.0, respectively. For a description of the sampling event and information on sampling rationale and locations, see Section 3.0.

A.2 ANALYTE TABLE DESCRIPTION

The "Sample Number" column lists the laboratory sample for which the analyte was measured.

The "Core:Segment" column specifies the core and segment from which each sample was derived.

The "Subsegment" column specifies the segment portion (subsegment) from which the sample was taken. This can be the entire segment (whole), the drainable liquid portion (DL), upper or lower half segment portions, or quarter segment portions (A refers to top quarter, B refers to second quarter).

The "Result" and "Duplicate" columns are self-explanatory. The "Sample Mean" column lists the average of the result and duplicate values. If the result and duplicate values were both detected, or one of the two values is detected and the other non-detected, then the mean is expressed as a detected value. If the result and duplicate values were both nondetected, then the mean is expressed as a nondetected. The result and duplicate values, as well as the result/duplicate means, are reported in the tables exactly as found in the original laboratory data package. The means may appear to have been rounded up in some cases and rounded down in others. This is because the analytical results given in the tables may have fewer

significant figures than originally reported, not because the means were incorrectly calculated.

The overall (or analyte concentration) means for the waste in tank 241-S-101 were calculated as follows:

The individual sample result and duplicate pairs were first averaged to obtain a sample mean. Sample means from the same segment were then averaged to obtain a segment mean, the segment means within a given core were averaged to obtain a core mean, and finally the core means were averaged to obtain the overall mean. As a note, not all of these steps were necessary for each analyte or for each subsegment, but the procedure to be followed is the same. All values, including those below the detection level (indicated by the less-than symbol, "<"), were utilized in calculating the overall means. If 50 percent or more of all the individual sample and duplicate results were detected, then the overall mean was expressed as a detected value. If less than 50 percent of all the individual results were detected, then the overall mean was expressed as a nondetected value. When nondetected values are used as qualitative results the mean concentration and inventory estimates are biased. The magnitude of the bias cannot be determined, but the bias is to more conservative concentration estimates.

The RSD (mean) was computed for applicable analytes using standard ANOVA statistical techniques. Relative standard deviations (of the mean) were calculated for all analytes with "detected" means, including those analytes which contained some nondetected results. Using nondetected results in the mean calculations also required their use in the RSD (mean) calculations. Whereas the use of nondetected results in mean calculations produces a known high bias, using these values in statistical calculations creates an unknown bias. Thus, the RSD (mean) estimates and the ANOVA values in which nondetected results were used should be interpreted with caution.

The "Projected Inventory" is the product of the overall analyte concentration mean, the volume of tank waste (1,571 kL for the solids and 45 kL for the liquids), the density, where applicable (1.65 mL for the solids), and the appropriate conversion factors.

The four quality control parameters assessed on the tank 241-S-101 samples were standard recoveries, spike recoveries, duplicate analyses (RPDs), and blanks. These were summarized in Section 5.1.2. More specific information is provided in the following appendix tables. Sample and duplicate pairs in which any of the QC parameters were outside their specified limits are superscripted in the "Sample Mean" column as follows:

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

Table A-1. Tank 241-S-101 Analytical Results: Aluminum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	19,600	23,500	21,550	80,500	14.7	2.09E+05
S96T002040	138: 3AR	Whole	29,900	30,300	30,100			
S96T001891	138: 5	Upper ½	96,400	92,900	94,650			
S96T001902		Lower ½	1.060E+05	1.080E+05	1.070E+05			
S96T002045	138: 6	Upper ½	97,100	94,900	96,000			
S96T002047		Lower ½	85,100	1.060E+05	95,550[QC:e]			
S96T002193	138: 7	Upper ½	1.070E+05	1.090E+05	1.080E+05			
S96T002202		Lower ½	1.190E+05	1.180E+05	1.185E+05			
S96T002046	138: 8	Upper ½	1.210E+05	1.210E+05	1.210E+05			
S96T002048		Lower ½	1.280E+05	1.300E+05	1.290E+05			
S96T002194	138: 9	Upper ½	1.330E+05	1.330E+05	1.330E+05			
S96T002199		Lower ½	1.200E+05	1.160E+05	1.180E+05			
S96T002090	142: 1	Upper ½	20,500	20,300	20,400			
S96T002310	142: 2	Upper ½	20,500	20,100	20,300			
S96T002316		Lower ½	24,000	23,600	23,800			
S96T002311	142: 3	Upper ½	22,900	22,800	22,850			
S96T002319		Lower ½	24,100	23,900	24,000			
S96T002092	142: 4	Upper ½	30,100	23,900	27,000[QC:e]			
S96T002105		Lower ½	74,200	65,600	69,900			
S96T002093	142: 5	Upper ½	1.110E+05	1.050E+05	1.080E+05			
S96T002106		Lower ½	1.230E+05	1.000E+05	1.115E+05			

Table A-1. Tank 241-S-101 Analytical Results: Aluminum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	1.050E+05	1.020E+05	1.035E+05	Cont.	Cont.	Cont.
S96T002091		Lower ½	1.020E+05	1.130E+05	1.075E+05			
S96T002095	142: 7	Upper ½	1.100E+05	1.130E+05	1.115E+05			
S96T002107		Lower ½	1.280E+05	1.300E+05	1.290E+05			
S96T002096	142: 8	Upper ½	1.470E+05	1.450E+05	1.460E+05			
S96T002108		Lower ½	1.250E+05	1.350E+05	1.300E+05			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	17,200	17,500	17,350	21,000	6.9	54,400
S96T001892	138: 5	Upper ½	20,600	21,800	21,200			
S96T001904		Lower ½	15,900	17,500	16,700			
S96T002049	138: 6	Upper ½	20,600	17,200	18,900			
S96T002050		Lower ½	16,800	15,200	16,000			
S96T002195	138: 7	Upper ½	21,100	16,300	18,700[QC:e]			
S96T002203		Lower ½	18,100	24,100	21,100[QC:e]			
S96T002051	138: 8	Upper ½	20,700	23,400	22,050			
S96T002052		Lower ½	25,000	23,600	24,300			
S96T002196	138: 9	Upper ½	39,300	25,800	32,550[QC:e]			
S96T002200		Lower ½	16,800	16,500	16,650			
S96T002097	142: 1	Upper ½	16,800	16,700	16,750			
S96T002312	142: 2	Upper ½	17,500	15,200	16,350			
S96T002317		Lower ½	17,700	17,500	17,600			

Table A-1. Tank 241-S-101 Analytical Results: Aluminum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	15,500	19,300	17,400[QC:e]	Cont.	Cont.	Cont.
S96T002320		Lower ½	18,900	18,900	18,900			
S96T002109	142: 4	Upper ½	17,800	17,700	17,750			
S96T002110		Lower ½	21,000	21,500	21,250			
S96T002111	142: 5	Upper ½	17,600	19,700	18,650			
S96T002112		Lower ½	15,100	18,600	16,850			
S96T002113	142: 6	Upper ½	17,000	19,700	18,350			
S96T002098		Lower ½	25,500	78,500	52,000[QC:e]			
S96T002114	142: 7	Upper ½	14,200	21,300	17,750[QC:e]			
S96T002115		Lower ½	28,100	22,400	25,250[QC:e]			
S96T002116	142: 8	Upper ½	32,100	27,600	29,850			
S96T002117		Lower ½	22,800	28,300	25,550[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	1.070E+05	1.050E+05	1.060E+05	88,900	19.3	2.30E+05
S96T002731	142	N/A	69,600	73,800	71,700			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	22,600	21,200	21,900	23,900	8.3	62,000
S96T002733	142	N/A	28,400	23,300	25,850			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	12,900	11,700	12,300	11,800	8.7	30,600
S96T002736	142	N/A	13,600	8,940	11,270[QC:e]			

Table A-1. Tank 241-S-101 Analytical Results: Aluminum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	25,000	25,000	25,000	24,500	2.9	1,100
S96T001909	138: 2R1	DL	25,300	25,600	25,450			
S96T002043	138: 3R	DL	23,300	22,900	23,100			

Table A-2. Tank 241-S-101 Analytical Results: Antimony. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,180	< 1,120	< 1,150	< 1,200	N/A	< 3,110
S96T002040	138: 3AR	Whole	< 1,220	< 1,140	< 1,180			
S96T001891	138: 5	Upper ½	< 1,260	< 1,270	< 1,265			
S96T001902		Lower ½	< 1,090	< 1,060	< 1,075			
S96T002045	138: 6	Upper ½	< 1,150	< 1,130	< 1,140			
S96T002047		Lower ½	< 1,240	< 1,140	< 1,190			
S96T002193	138: 7	Upper ½	< 1,250	< 1,270	< 1,260			
S96T002202		Lower ½	< 1,200	< 1,200	< 1,200			
S96T002046	138: 8	Upper ½	< 1,230	< 1,250	< 1,240			
S96T002048		Lower ½	< 1,130	< 1,220	< 1,175			
S96T002194	138: 9	Upper ½	< 1,160	< 1,230	< 1,195			
S96T002199		Lower ½	< 1,280	< 1,250	< 1,265			
S96T002090	142: 1	Upper ½	< 1,230	< 1,230	< 1,230			
S96T002310	142: 2	Upper ½	< 1,130	< 1,110	< 1,120			
S96T002316		Lower ½	< 1,220	< 1,220	< 1,220			
S96T002311	142: 3	Upper ½	< 1,210	< 1,230	< 1,220			
S96T002319		Lower ½	< 1,170	< 1,140	< 1,155			
S96T002092	142: 4	Upper ½	< 1,210	< 1,200	< 1,205			
S96T002105		Lower ½	< 1,200	< 1,240	< 1,220			

Table A-2. Tank 241-S-101 Analytical Results: Antimony. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 1,160	< 1,120	< 1,140	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 1,230	< 1,120	< 1,175			
S96T002094	142: 6	Upper ½	< 1,240	< 1,220	< 1,230			
S96T002091		Lower ½	< 1,240	< 1,230	< 1,235			
S96T002095	142: 7	Upper ½	< 1,190	< 1,200	< 1,195			
S96T002107		Lower ½	< 1,290	< 1,300	< 1,295			
S96T002096	142: 8	Upper ½	< 1,190	< 1,190	< 1,190			
S96T002108		Lower ½	1,370	< 1,200	< 1,285			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 22.9	< 23.2	< 23.05	< 23.2	N/A	< 60.1
S96T001892	138: 5	Upper ½	< 22.9	< 24.2	< 23.55			
S96T001904		Lower ½	< 21.5	< 23.5	< 22.5			
S96T002049	138: 6	Upper ½	< 22.6	< 23.4	< 23			
S96T002050		Lower ½	< 22.3	< 24.5	< 23.4			
S96T002195	138: 7	Upper ½	< 26.4	< 27	< 26.7			
S96T002203		Lower ½	< 23.5	< 24.5	< 24			
S96T002051	138: 8	Upper ½	< 22.2	< 22.8	< 22.5			
S96T002052		Lower ½	< 22.8	< 23.5	< 23.15			
S96T002196	138: 9	Upper ½	< 22.1	< 21.8	< 21.95			
S96T002200		Lower ½	< 22.1	< 23.9	< 23			
S96T002097	142: 1	Upper ½	< 21.4	< 21.4	< 21.4			

Table A-2. Tank 241-S-101 Analytical Results: Antimony. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	< 24.6	< 22.1	< 23.35	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 22.4	< 23.4	< 22.9			
S96T002313	142: 3	Upper ½	< 24.6	< 24.3	< 24.45			
S96T002320		Lower ½	< 25	< 24.1	< 24.55			
S96T002109	142: 4	Upper ½	< 24.1	< 24.5	< 24.3			
S96T002110		Lower ½	< 23.6	< 23.2	< 23.4			
S96T002111	142: 5	Upper ½	< 21.2	< 23.1	< 22.15			
S96T002112		Lower ½	< 21.4	< 22.9	< 22.15			
S96T002113	142: 6	Upper ½	< 23.4	< 26.9	< 25.15			
S96T002098		Lower ½	< 23.6	< 24.5	< 24.05			
S96T002114	142: 7	Upper ½	< 23.8	< 24.1	< 23.95			
S96T002115		Lower ½	< 22	< 21.5	< 21.75			
S96T002116	142: 8	Upper ½	< 22.2	< 21.6	< 21.9			
S96T002117		Lower ½	< 22.5	< 22.2	< 22.35			
Solids composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,260	< 1,300	< 1,280	< 1,260	N/A	< 3,270
S96T002731	142	N/A	< 1,220	< 1,260	< 1,240			
Solids composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 41.2	< 40.9	< 41.05	< 40.2	N/A	< 104
S96T002733	142	N/A	< 40.6	< 38.1	< 39.35			

Table A-2. Tank 241-S-101 Analytical Results: Antimony. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 33.7	< 32.8	< 33.25	< 32.4	N/A	< 84.0
S96T002736	142	DL	< 32.9	< 30.3	< 31.6			
Drainable Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 24.1	< 24.1	< 24.1	< 24.1	N/A	< 1.08
S96T001909	138: 2R1	DL	< 24.1	< 24.1	< 24.1			
S96T002043	138: 3R	DL	< 24.1	< 24.1	< 24.1			

Table A-3. Tank 241-S-101 Analytical Results: Arsenic. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-3. Tank 241-S-101 Analytical Results: Arsenic. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 38.7	N/A	< 100
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85			
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			

Table A-3. Tank 241-S-101 Analytical Results: Arsenic. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	< 39.3	< 38.6	< 38.95			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 138
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			

Table A-3. Tank 241-S-101 Analytical Results: Arsenic. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-4. Tank 241-S-101 Analytical Results: Barium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 999	N/A	< 2,590
S96T002040	138: 3AR	Whole	< 1,020	< 954	< 987			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	< 907	< 880	< 893.5			
S96T002045	138: 6	Upper ½	< 959	< 943	< 951			
S96T002047		Lower ½	< 1,040	< 953	< 996.5			
S96T002193	138: 7	Upper ½	< 1,040	< 1,060	< 1,050			
S96T002202		Lower ½	< 998	< 1,000	< 999			
S96T002046	138: 8	Upper ½	< 1,030	< 1,040	< 1,035			
S96T002048		Lower ½	< 946	< 1,020	< 983			
S96T002194	138: 9	Upper ½	< 963	< 1,020	< 991.5			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	< 998	< 1,030	< 1,014			

Table A-4. Tank 241-S-101 Analytical Results: Barium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 968	< 936	< 952	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 1,020	< 936	< 978			
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025			
S96T002091		Lower ½	< 1,030	< 1,020	< 1,025			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	< 1,070	< 1,090	< 1,080			
S96T002096	142: 8	Upper ½	< 995	< 991	< 993			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 19.1	< 19.4	< 19.25	< 26.1	N/A	< 67.7
S96T001892	138: 5	Upper ½	< 19.1	< 20.1	< 19.6			
S96T001904		Lower ½	< 17.9	< 19.6	< 18.75			
S96T002049	138: 6	Upper ½	< 19.2	< 20.9	< 20.05			
S96T002050		Lower ½	24.4	27.1	25.75			
S96T002195	138: 7	Upper ½	28.2	28.9	28.55			
S96T002203		Lower ½	32.3	34.6	33.45			
S96T002051	138: 8	Upper ½	39.1	38.8	38.95			
S96T002052		Lower ½	27.8	27.6	27.7			
S96T002196	138: 9	Upper ½	52.2	56.9	54.55			
S96T002200		Lower ½	25.8	23.8	24.8			

Table A-4. Tank 241-S-101 Analytical Results: Barium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002097	142: 1	Upper ½	< 17.9	< 17.9	< 17.9			
S96T002312	142: 2	Upper ½	< 20.5	< 18.4	< 19.45	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 18.7	< 19.5	< 19.1			
S96T002313	142: 3	Upper ½	24.5	21.3	22.9			
S96T002320		Lower ½	< 20.9	< 20.1	< 20.5			
S96T002109	142: 4	Upper ½	< 20.1	< 20.5	< 20.3			
S96T002110		Lower ½	< 19.7	< 19.6	< 19.65			
S96T002111	142: 5	Upper ½	< 17.7	< 19.3	< 18.5			
S96T002112		Lower ½	19.9	20.3	20.1			
S96T002113	142: 6	Upper ½	< 19.5	< 22.4	< 20.95			
S96T002098		Lower ½	27.3	46.2	36.75[QC:e]			
S96T002114	142: 7	Upper ½	30.5	30.8	30.65			
S96T002115		Lower ½	39.6	38.6	39.1			
S96T002116	142: 8	Upper ½	43.9	42.2	43.05			
S96T002117		Lower ½	< 20.5	< 18.5	< 19.5			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,050	< 1,090	< 1,070	< 1,050	N/A	< 2,720
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			

Table A-4. Tank 241-S-101 Analytical Results: Barium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: acid digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002724	138	N/A	< 34.3	< 34.1	< 34.2	< 33.5	N/A	< 86.8
S96T002733	142	N/A	< 33.8	< 31.7	< 32.75			
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 28.1	< 27.3	< 27.7	< 27.0	N/A	< 70.0
S96T002736	142	N/A	< 27.4	< 25.2	< 26.3			
Drainable Liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	< 20.1	< 20.1	< 20.1	< 20.1	N/A	< 0.905
S96T001909	138: 2R1	DL	< 20.1	< 20.1	< 20.1			
S96T002043	138: 3R	DL	< 20.1	< 20.1	< 20.1			

Table A-5. Tank 241-S-101 Analytical Results: Beryllium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 98.4	< 93.1	< 95.75	< 99.9	N/A	< 259
S96T002040	138: 3AR	Whole	< 102	< 95.4	< 98.7			
S96T001891	138: 5	Upper ½	< 105	< 106	< 105.5			
S96T001902		Lower ½	< 90.7	< 88	< 89.35			
S96T002045	138: 6	Upper ½	< 95.9	< 94.3	< 95.1			
S96T002047		Lower ½	< 104	< 95.3	< 99.65			
S96T002193	138: 7	Upper ½	< 104	< 106	< 105			
S96T002202		Lower ½	< 99.8	< 100	< 99.9			
S96T002046	138: 8	Upper ½	< 103	< 104	< 103.5			
S96T002048		Lower ½	< 94.6	< 102	< 98.3			
S96T002194	138: 9	Upper ½	< 96.3	< 102	< 99.15			
S96T002199		Lower ½	< 106	< 104	< 105			
S96T002090	142: 1	Upper ½	< 103	< 102	< 102.5			
S96T002310	142: 2	Upper ½	< 93.8	< 92.3	< 93.05			
S96T002316		Lower ½	< 102	< 101	< 101.5			
S96T002311	142: 3	Upper ½	< 101	< 103	< 102			
S96T002319		Lower ½	< 97.7	< 95.4	< 96.55			
S96T002092	142: 4	Upper ½	< 101	< 99.9	< 100.45			
S96T002105		Lower ½	< 99.8	< 103	< 101.4			
S96T002093	142: 5	Upper ½	< 96.8	< 93.6	< 95.2			
S96T002106		Lower ½	< 102	< 93.6	< 97.8			

Table A-5. Tank 241-S-101 Analytical Results: Beryllium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 104	< 101	< 102.5	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 103	< 102	< 102.5			
S96T002095	142: 7	Upper ½	< 99.3	< 100	< 99.65			
S96T002107		Lower ½	< 107	< 109	< 108			
S96T002096	142: 8	Upper ½	< 99.5	< 99.1	< 99.3			
S96T002108		Lower ½	< 102	< 99.8	< 100.9			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 1.91	< 1.94	< 1.925	< 1.94	N/A	< 5.03
S96T001892	138: 5	Upper ½	< 1.91	< 2.01	< 1.96			
S96T001904		Lower ½	< 1.79	< 1.96	< 1.875			
S96T002049	138: 6	Upper ½	< 1.88	< 1.95	< 1.915			
S96T002050		Lower ½	< 1.85	< 2.04	< 1.945			
S96T002195	138: 7	Upper ½	< 2.2	< 2.25	< 2.225			
S96T002203		Lower ½	< 1.96	< 2.04	< 2.00			
S96T002051	138: 8	Upper ½	< 1.85	< 1.9	< 1.875			
S96T002052		Lower ½	< 1.9	< 1.96	< 1.93			
S96T002196	138: 9	Upper ½	< 1.85	< 1.82	< 1.835			
S96T002200		Lower ½	< 1.84	< 1.99	< 1.915			
S96T002097	142: 1	Upper ½	< 1.79	< 1.79	< 1.79			
S96T002312	142: 2	Upper ½	< 2.05	< 1.84	< 1.945			
S96T002317		Lower ½	< 1.87	< 1.95	< 1.91			

Table A-5. Tank 241-S-101 Analytical Results: Beryllium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 2.05	< 2.03	< 2.04	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 2.09	< 2.01	< 2.05			
S96T002109	142: 4	Upper ½	< 2.01	< 2.05	< 2.03			
S96T002110		Lower ½	< 1.97	< 1.93	< 1.95			
S96T002111	142: 5	Upper ½	< 1.77	< 1.93	< 1.85			
S96T002112		Lower ½	< 1.78	< 1.91	< 1.845			
S96T002113	142: 6	Upper ½	< 1.95	< 2.24	< 2.095			
S96T002098		Lower ½	< 1.96	< 2.04	< 2.00			
S96T002114	142: 7	Upper ½	< 1.98	< 2.01	< 1.995			
S96T002115		Lower ½	< 1.84	< 1.79	< 1.815			
S96T002116	142: 8	Upper ½	< 1.85	< 1.8	< 1.825			
S96T002117		Lower ½	< 1.88	< 1.85	< 1.865			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 105	< 109	< 107	< 105	N/A	< 272
S96T002731	142	N/A	< 102	< 105	< 103.5			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 3.43	< 3.41	< 3.42	< 3.35	N/A	< 8.68
S96T002733	142	N/A	< 3.38	< 3.17	< 3.275			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 2.81	< 2.73	< 2.77	< 2.70	N/A	< 7.00
S96T002736	142	N/A	< 2.74	< 2.52	< 2.63			

Table A-5. Tank 241-S-101 Analytical Results: Beryllium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 2.00	< 2.00	< 2.00	< 2.00	N/A	< 0.0900
S96T001909	138: 2R1	DL	< 2.00	< 2.00	< 2.00			
S96T002043	138: 3R	DL	< 2.00	< 2.00	< 2.00			

Table A-6. Tank 241-S-101 Analytical Results: Bismuth. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-6. Tank 241-S-101 Analytical Results: Bismuth. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	53.3	< 38.7	46[QC:e]	< 47.5	N/A	< 123
S96T001892	138: 5	Upper ½	40.1	44.5	42.3			
S96T001904		Lower ½	51.9	44.3	48.1			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	61.6	73.3	67.45			
S96T002312	142: 2	Upper ½	60.6	51.3	55.95			
S96T002317		Lower ½	65	81.2	73.1[QC:e]			

Table A-6. Tank 241-S-101 Analytical Results: Bismuth. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	60.9	61.3	61.1			
S96T002109	142: 4	Upper ½	64.6	78.4	71.5			
S96T002110		Lower ½	75.9	83.2	79.55			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	71	71.9	71.45			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			

Table A-6. Tank 241-S-101 Analytical Results: Bismuth. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-7. Tank 241-S-101 Analytical Results: Boron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 999	N/A	< 2,590
S96T002040	138: 3AR	Whole	< 1,020	< 954	< 987			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	< 907	< 880	< 893.5			
S96T002045	138: 6	Upper ½	< 959	< 943	< 951			
S96T002047		Lower ½	< 1,040	< 953	< 996.5			
S96T002193	138: 7	Upper ½	< 1,040	< 1,060	< 1,050			
S96T002202		Lower ½	< 998	< 1,000	< 999			
S96T002046	138: 8	Upper ½	< 1,030	< 1,040	< 1,035			
S96T002048		Lower ½	< 946	< 1,020	< 983			
S96T002194	138: 9	Upper ½	< 963	< 1,020	< 991.5			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	< 998	< 1,030	< 1,014			
S96T002093	142: 5	Upper ½	< 968	< 936	< 952			
S96T002106		Lower ½	< 1,020	< 936	< 978			

Table A-7. Tank 241-S-101 Analytical Results: Boron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 1,030	< 1,020	< 1,025			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	< 1,070	< 1,090	< 1,080			
S96T002096	142: 8	Upper ½	< 995	< 991	< 993			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	77.3	78.9	78.1	86.6	24.1	224
S96T001892	138: 5	Upper ½	77.1	83	80.05			
S96T001904		Lower ½	65	70.6	67.8			
S96T002049	138: 6	Upper ½	62.6	59.4	61.0			
S96T002050		Lower ½	52.8	102	77.4[QC:e]			
S96T002195	138: 7	Upper ½	64.5	90.9	77.7[QC:e]			
S96T002203		Lower ½	37	42.7	39.85			
S96T002051	138: 8	Upper ½	51.6	80.4	66.0[QC:e]			
S96T002052		Lower ½	71.2	20.8	46.0[QC:e]			
S96T002196	138: 9	Upper ½	69.2	57.3	63.25			
S96T002200		Lower ½	55.3	51.2	53.25			
S96T002097	142: 1	Upper ½	136	152	144			
S96T002312	142: 2	Upper ½	163	123	143[QC:e]			
S96T002317		Lower ½	132	157	144.5			

Table A-7. Tank 241-S-101 Analytical Results: Boron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	75.8	88.9	82.35	Cont.	Cont.	Cont.
S96T002320		Lower ½	137	86.1	111.55[QC:e]			
S96T002109	142: 4	Upper ½	132	144	138			
S96T002110		Lower ½	70.1	58.1	64.1			
S96T002111	142: 5	Upper ½	64.2	110	87.1[QC:e]			
S96T002112		Lower ½	88	63.5	75.75[QC:e]			
S96T002113	142: 6	Upper ½	157	133	145			
S96T002098		Lower ½	114	229	171.5[QC:e]			
S96T002114	142: 7	Upper ½	57.8	43.8	50.8[QC:e]			
S96T002115		Lower ½	51.9	49.2	50.55			
S96T002116	142: 8	Upper ½	77.9	77.7	77.8			
S96T002117		Lower ½	99.1	95.3	97.2			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,050	< 1,090	< 1,070	< 1,050	N/A	< 2,720
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 34.3	64.6	49.45[QC:e]	54.0	15.8	140
S96T002733	142	N/A	71.3	45.7	58.5[QC:e]			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	486	563	524.5	446	17.7	1,160
S96T002736	142	N/A	377	356	366.5			

Table A-7. Tank 241-S-101 Analytical Results: Boron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	68.3	69	68.65	70.1	1.5	3.17
S96T001909	138: 2R1	DL	69.7	70.7	70.2			
S96T002043	138: 3R	DL	71.7	72.9	72.3			

Table A-8. Tank 241-S-101 Analytical Results: Cadmium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 98.4	< 93.1	< 95.75	< 99.9	N/A	< 259
S96T002040	138: 3AR	Whole	< 102	< 95.4	< 98.7			
S96T001891	138: 5	Upper ½	< 105	< 106	< 105.5			
S96T001902		Lower ½	< 90.7	< 88	< 89.35			
S96T002045	138: 6	Upper ½	< 95.9	< 94.3	< 95.1			
S96T002047		Lower ½	< 104	< 95.3	< 99.65			
S96T002193	138: 7	Upper ½	< 104	< 106	< 105			
S96T002202		Lower ½	< 99.8	< 100	< 99.9			
S96T002046	138: 8	Upper ½	< 103	< 104	< 103.5			
S96T002048		Lower ½	< 94.6	< 102	< 98.3			
S96T002194	138: 9	Upper ½	< 96.3	< 102	< 99.15			
S96T002199		Lower ½	< 106	< 104	< 105			
S96T002090	142: 1	Upper ½	< 103	< 102	< 102.5			
S96T002310	142: 2	Upper ½	< 93.8	< 92.3	< 93.05			
S96T002316		Lower ½	< 102	< 101	< 101.5			
S96T002311	142: 3	Upper ½	< 101	< 103	< 102			
S96T002319		Lower ½	< 97.7	< 95.4	< 96.55			
S96T002092	142: 4	Upper ½	< 101	< 99.9	< 100.45			
S96T002105		Lower ½	< 99.8	< 103	< 101.4			
S96T002093	142: 5	Upper ½	< 96.8	< 93.6	< 95.2			
S96T002106		Lower ½	< 102	< 93.6	< 97.8			

Table A-8. Tank 241-S-101 Analytical Results: Cadmium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 104	< 101	< 102.5	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 103	< 102	< 102.5			
S96T002095	142: 7	Upper ½	< 99.3	< 100	< 99.65			
S96T002107		Lower ½	< 107	< 109	< 108			
S96T002096	142: 8	Upper ½	< 99.5	< 99.1	< 99.3			
S96T002108		Lower ½	< 102	< 99.8	< 100.9			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	6.78	7.03	6.905	4.46	31.4	11.6
S96T001892	138: 5	Upper ½	2.37	2.98	2.675[QC:e]			
S96T001904		Lower ½	5.45	6.44	5.945			
S96T002049	138: 6	Upper ½	2.05	2.32	2.185			
S96T002050		Lower ½	< 1.85	< 2.04	< 1.945			
S96T002195	138: 7	Upper ½	< 2.2	< 2.25	< 2.225			
S96T002203		Lower ½	< 1.96	< 2.04	< 2.00			
S96T002051	138: 8	Upper ½	< 1.85	< 1.9	< 1.875			
S96T002052		Lower ½	< 1.9	< 1.96	< 1.93			
S96T002196	138: 9	Upper ½	< 1.85	< 1.82	< 1.835			
S96T002200		Lower ½	< 1.84	< 1.99	< 1.915			
S96T002097	142: 1	Upper ½	9.56	10.1	9.83			
S96T002312	142: 2	Upper ½	10.2	9.2	9.7			
S96T002317		Lower ½	10.1	10.5	10.3			

Table A-8. Tank 241-S-101 Analytical Results: Cadmium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 2.05	< 2.03	< 2.04	Cont.	Cont.	Cont.
S96T002320		Lower ½	10.1	9.98	10.04			
S96T002109	142: 4	Upper ½	11.3	11.6	11.45			
S96T002110		Lower ½	7.12	6.54	6.83			
S96T002111	142: 5	Upper ½	1.78	2.32	2.05[QC:e]			
S96T002112		Lower ½	3.37	3.49	3.43			
S96T002113	142: 6	Upper ½	9.67	10.9	10.285			
S96T002098		Lower ½	< 1.96	< 2.04	< 2			
S96T002114	142: 7	Upper ½	< 1.98	< 2.01	< 1.995			
S96T002115		Lower ½	< 1.84	< 1.79	< 1.815			
S96T002116	142: 8	Upper ½	< 1.85	< 1.8	< 1.825			
S96T002117		Lower ½	< 1.88	< 1.85	< 1.865			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 105	< 109	< 107	< 105	N/A	< 272
S96T002731	142	N/A	< 102	< 105	< 103.5			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 3.43	< 3.41	< 3.42	3.93	12.9	10.2
S96T002733	142	N/A	4.86	4.01	4.435			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 2.81	< 2.73	< 2.77	< 2.70	N/A	< 7.00
S96T002736	142	N/A	< 2.74	< 2.52	< 2.63			

Table A-8. Tank 241-S-101 Analytical Results: Cadmium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 2.00	< 2.00	< 2.00	< 2.00	N/A	< 0.0900
S96T001909	138: 2R1	DL	< 2.00	< 2.00	< 2.00			
S96T002043	138: 3R	DL	< 2.00	< 2.00	< 2.00			

Table A-9. Tank 241-S-101 Analytical Results: Calcium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-9. Tank 241-S-101 Analytical Results: Calcium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	305	308	306.5	329	10.5	853
S96T001892	138: 5	Upper ½	316	333	324.5			
S96T001904		Lower ½	275	304	289.5			
S96T002049	138: 6	Upper ½	241	419	330[QC:e]			
S96T002050		Lower ½	393	444	418.5			
S96T002195	138: 7	Upper ½	397	290	343.5[QC:e]			
S96T002203		Lower ½	281	266	273.5			
S96T002051	138: 8	Upper ½	434	412	423			
S96T002052		Lower ½	448	429	438.5			
S96T002196	138: 9	Upper ½	384	362	373			
S96T002200		Lower ½	226	208	217			
S96T002097	142: 1	Upper ½	231	256	243.5			

Table A-9. Tank 241-S-101 Analytical Results: Calcium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	263	218	240.5	Cont.	Cont.	Cont.
S96T002317		Lower ½	278	247	262.5			
S96T002313	142: 3	Upper ½	265	221	243			
S96T002320		Lower ½	297	226	261.5[QC:e]			
S96T002109	142: 4	Upper ½	300	330	315			
S96T002110		Lower ½	998	1,170	1,084			
S96T002111	142: 5	Upper ½	158	207	182.5[QC:e]			
S96T002112		Lower ½	208	232	220			
S96T002113	142: 6	Upper ½	393	288	340.5[QC:e]			
S96T002098		Lower ½	258	358	308[QC:e]			
S96T002114	142: 7	Upper ½	237	244	240.5			
S96T002115		Lower ½	278	269	273.5			
S96T002116	142: 8	Upper ½	328	333	330.5			
S96T002117		Lower ½	351	208	279.5[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	400	485	442.5	435	5.2	1,130
S96T002733	142	N/A	393	461	427			

Table A-9. Tank 241-S-101 Analytical Results: Calcium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-10. Tank 241-S-101 Analytical Results: Cerium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-10. Tank 241-S-101 Analytical Results: Cerium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 38.8	N/A	< 101
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	39.4	< 38.15			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85			
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			

Table A-10. Tank 241-S-101 Analytical Results: Cerium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	< 39.3	< 38.6	< 38.95			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	73.1	< 68.2	< 70.65	< 68.1	N/A	< 177
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			
Solid composites: H2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			

Table A-10. Tank 241-S-101 Analytical Results: Cerium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-11. Tank 241-S-101 Analytical Results: Chromium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	8,800	11,000	9,900[QC:e]	7,250	20.5	18,800
S96T002040	138: 3AR	Whole	20,200	20,300	20,250			
S96T001891	138: 5	Upper ½	6,790	6,740	6,765			
S96T001902		Lower ½	4,600	4,750	4,675			
S96T002045	138: 6	Upper ½	3,510	3,480	3,495			
S96T002047		Lower ½	2,100	2,600	2,350[QC:e]			
S96T002193	138: 7	Upper ½	2,340	2,330	2,335			
S96T002202		Lower ½	2,320	2,360	2,340			
S96T002046	138: 8	Upper ½	2,370	2,370	2,370			
S96T002048		Lower ½	2,340	2,360	2,350			
S96T002194	138: 9	Upper ½	2,320	2,320	2,320			
S96T002199		Lower ½	2,400	2,370	2,385			
S96T002090	142: 1	Upper ½	12,200	12,300	12,250			
S96T002310	142: 2	Upper ½	12,000	11,400	11,700			
S96T002316		Lower ½	14,000	13,800	13,900			
S96T002311	142: 3	Upper ½	13,400	12,900	13,150			
S96T002319		Lower ½	12,600	12,400	12,500			
S96T002092	142: 4	Upper ½	14,600	14,800	14,700			
S96T002105		Lower ½	12,800	10,700	11,750			
S96T002093	142: 5	Upper ½	6,590	6,320	6,455			
S96T002106		Lower ½	6,220	5,100	5,660			

Table A-11. Tank 241-S-101 Analytical Results: Chromium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	2,810	2,820	2,815	Cont.	Cont.	Cont.
S96T002091		Lower ½	1,590	1,910	1,750			
S96T002095	142: 7	Upper ½	2,060	2,010	2,035			
S96T002107		Lower ½	1,570	2,080	1,825[QC:e]			
S96T002096	142: 8	Upper ½	2,210	2,250	2,230			
S96T002108		Lower ½	2,360	2,320	2,340			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	6,200	6,330	6,265	4,740	31.6	12,300
S96T001892	138: 5	Upper ½	4,320	4,590	4,455			
S96T001904		Lower ½	4,420	4,870	4,645			
S96T002049	138: 6	Upper ½	2,840	2,910	2,875			
S96T002050		Lower ½	2,310	2,280	2,295			
S96T002195	138: 7	Upper ½	2,020	2,050	2,035			
S96T002203		Lower ½	2,040	2,220	2,130			
S96T002051	138: 8	Upper ½	2,110	2,080	2,095			
S96T002052		Lower ½	2,080	2,040	2,060			
S96T002196	138: 9	Upper ½	2,000	1,960	1,980			
S96T002200		Lower ½	2,100	2,170	2,135			
S96T002097	142: 1	Upper ½	10,300	10,200	10,250			
S96T002312	142: 2	Upper ½	10,700	9,420	10,060			
S96T002317		Lower ½	10,200	10,500	10,350			

Table A-11. Tank 241-S-101 Analytical Results: Chromium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	2,430	2,100	2,265	Cont.	Cont.	Cont.
S96T002320		Lower ½	9,870	9,840	9,855			
S96T002109	142: 4	Upper ½	11,900	11,900	11,900			
S96T002110		Lower ½	7,060	7,430	7,245			
S96T002111	142: 5	Upper ½	2,760	3,880	3,320[QC:e]			
S96T002112		Lower ½	3,500	4,090	3,795			
S96T002113	142: 6	Upper ½	9,840	11,300	10,570			
S96T002098		Lower ½	1,560	2,490	2,025[QC:e]			
S96T002114	142: 7	Upper ½	1,680	1,700	1,690			
S96T002115		Lower ½	1,870	1,830	1,850			
S96T002116	142: 8	Upper ½	1,950	1,890	1,920			
S96T002117		Lower ½	2,010	2,020	2,015			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	3,250	3,310	3,280	5,230	37.3	13,600
S96T002731	142	N/A	7,050	7,310	7,180			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	2,550	2,470	2,510	3,300	24.0	8,560
S96T002733	142	N/A	4,290	3,900	4,095			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	2,070	1,900	1,985	1,570	26.4	4,070
S96T002736	142	N/A	1,170	1,140	1,155			

Table A-11. Tank 241-S-101 Analytical Results: Chromium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	830	829	829.5	813	1.3	36.6
S96T001909	138: 2R1	DL	812	824	818			
S96T002043	138: 3R	DL	805	780	792.5			

Table A-12. Tank 241-S-101 Analytical Results: Cobalt. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 393	< 372	< 382.5	< 400	N/A	< 1,040
S96T002040	138: 3AR	Whole	< 407	< 381	< 394			
S96T001891	138: 5	Upper ½	< 420	< 423	< 421.5			
S96T001902		Lower ½	< 363	< 352	< 357.5			
S96T002045	138: 6	Upper ½	< 383	< 377	< 380			
S96T002047		Lower ½	< 415	< 381	< 398			
S96T002193	138: 7	Upper ½	< 416	< 425	< 420.5			
S96T002202		Lower ½	< 399	< 401	< 400			
S96T002046	138: 8	Upper ½	< 410	< 417	< 413.5			
S96T002048		Lower ½	< 378	< 408	< 393			
S96T002194	138: 9	Upper ½	< 385	< 410	< 397.5			
S96T002199		Lower ½	< 425	< 415	< 420			
S96T002090	142: 1	Upper ½	< 411	< 410	< 410.5			
S96T002310	142: 2	Upper ½	< 375	< 369	< 372			
S96T002316		Lower ½	< 408	< 405	< 406.5			
S96T002311	142: 3	Upper ½	< 404	< 411	< 407.5			
S96T002319		Lower ½	< 391	< 382	< 386.5			
S96T002092	142: 4	Upper ½	< 403	< 399	< 401			
S96T002105		Lower ½	< 399	< 412	< 405.5			
S96T002093	142: 5	Upper ½	< 387	< 374	< 380.5			
S96T002106		Lower ½	< 409	< 375	< 392			

Table A-12. Tank 241-S-101 Analytical Results: Cobalt. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 415	< 405	< 410	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 412	< 409	< 410.5			
S96T002095	142: 7	Upper ½	< 397	< 401	< 399			
S96T002107		Lower ½	< 429	< 435	< 432			
S96T002096	142: 8	Upper ½	< 398	< 397	< 397.5			
S96T002108		Lower ½	< 408	< 399	< 403.5			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 7.62	< 7.75	< 7.685	< 7.75	N/A	< 20.1
S96T001892	138: 5	Upper ½	< 7.64	< 8.05	< 7.845			
S96T001904		Lower ½	< 7.16	< 7.84	< 7.5			
S96T002049	138: 6	Upper ½	< 7.53	< 7.79	< 7.66			
S96T002050		Lower ½	< 7.42	< 8.18	< 7.8			
S96T002195	138: 7	Upper ½	< 8.8	< 8.98	< 8.89			
S96T002203		Lower ½	< 7.82	< 8.15	< 7.985			
S96T002051	138: 8	Upper ½	< 7.39	< 7.6	< 7.495			
S96T002052		Lower ½	< 7.58	< 7.82	< 7.7			
S96T002196	138: 9	Upper ½	< 7.38	< 7.28	< 7.33			
S96T002200		Lower ½	< 7.36	< 7.96	< 7.66			
S96T002097	142: 1	Upper ½	< 7.15	< 7.15	< 7.15			
S96T002312	142: 2	Upper ½	< 8.19	< 7.36	< 7.775			
S96T002317		Lower ½	< 7.46	< 7.81	< 7.635			

Table A-12. Tank 241-S-101 Analytical Results: Cobalt. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 8.19	< 8.1	< 8.145	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 8.34	< 8.03	< 8.185			
S96T002109	142: 4	Upper ½	< 8.02	< 8.18	< 8.1			
S96T002110		Lower ½	< 7.86	< 7.72	< 7.79			
S96T002111	142: 5	Upper ½	< 7.07	< 7.72	< 7.395			
S96T002112		Lower ½	< 7.13	< 7.64	< 7.385			
S96T002113	142: 6	Upper ½	< 7.79	< 8.95	< 8.37			
S96T002098		Lower ½	< 7.86	< 8.16	< 8.01			
S96T002114	142: 7	Upper ½	< 7.92	< 8.05	< 7.985			
S96T002115		Lower ½	< 7.34	< 7.17	< 7.255			
S96T002116	142: 8	Upper ½	< 7.41	< 7.2	< 7.305			
S96T002117		Lower ½	< 7.51	< 7.4	< 7.455			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 418	< 434	< 426	< 420	N/A	< 1,090
S96T002731	142	N/A	< 408	< 421	< 414.5			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 13.7	< 13.6	< 13.65	< 13.4	N/A	< 34.7
S96T002733	142	N/A	< 13.5	< 12.7	< 13.1			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 11.2	< 10.9	< 11.05	< 10.8	N/A	< 28.0
S96T002736	142	N/A	< 11	< 10.1	< 10.55			

Table A-12. Tank 241-S-101 Analytical Results: Cobalt. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 8.02	< 8.02	< 8.02	< 8.02	N/A	< 0.361
S96T001909	138: 2R1	DL	< 8.02	< 8.02	< 8.02			
S96T002043	138: 3R	DL	< 8.02	< 8.02	< 8.02			

Table A-13. Tank 241-S-101 Analytical Results: Copper. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	< 206	N/A	< 534
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	< 181	< 176	< 178.5			
S96T002045	138: 6	Upper ½	520	< 189	354.5[QC:e]			
S96T002047		Lower ½	< 207	< 191	< 199			
S96T002193	138: 7	Upper ½	< 208	< 212	< 210			
S96T002202		Lower ½	< 200	< 200	< 200			
S96T002046	138: 8	Upper ½	< 205	< 209	< 207			
S96T002048		Lower ½	< 189	< 204	< 196.5			
S96T002194	138: 9	Upper ½	< 193	< 205	< 199			
S96T002199		Lower ½	< 213	< 208	< 210.5			
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5			
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5			
S96T002316		Lower ½	< 204	< 203	< 203.5			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	< 204	< 187	< 195.5			

Table A-13. Tank 241-S-101 Analytical Results: Copper. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 207	< 203	< 205	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 206	< 205	< 205.5			
S96T002095	142: 7	Upper ½	< 199	< 201	< 200			
S96T002107		Lower ½	< 215	< 217	< 216			
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5			
S96T002108		Lower ½	< 204	< 200	< 202			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	7.76	7.87	7.815	12.7	21.4	32.9
S96T001892	138: 5	Upper ½	8.75	9.18	8.965			
S96T001904		Lower ½	5.86	6.14	6.00			
S96T002049	138: 6	Upper ½	8.49	8.9	8.695			
S96T002050		Lower ½	11.6	26.5	19.05[QC:e]			
S96T002195	138: 7	Upper ½	17.6	15.7	16.65			
S96T002203		Lower ½	14.9	16.6	15.75			
S96T002051	138: 8	Upper ½	16.8	20.6	18.7			
S96T002052		Lower ½	25.4	25.5	25.45			
S96T002196	138: 9	Upper ½	30.3	30.8	30.55			
S96T002200		Lower ½	13.7	14.3	14			
S96T002097	142: 1	Upper ½	< 3.57	4.16	3.865			
S96T002312	142: 2	Upper ½	9.72	< 3.68	6.7[QC:e]			
S96T002317		Lower ½	< 3.73	< 3.91	< 3.82			

Table A-13. Tank 241-S-101 Analytical Results: Copper. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	7.24	7.76	7.5	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 4.17	< 4.01	< 4.09			
S96T002109	142: 4	Upper ½	< 4.01	6.29	5.15[QC:e]			
S96T002110		Lower ½	11	6.89	8.945[QC:e]			
S96T002111	142: 5	Upper ½	5.3	8.89	7.095[QC:e]			
S96T002112		Lower ½	10.7	8.84	9.77			
S96T002113	142: 6	Upper ½	< 3.89	< 4.48	< 4.185			
S96T002098		Lower ½	28.9	25.5	27.2			
S96T002114	142: 7	Upper ½	16.6	16.2	16.4			
S96T002115		Lower ½	18.6	18.3	18.45			
S96T002116	142: 8	Upper ½	19.1	18.6	18.85			
S96T002117		Lower ½	11.2	9.15	10.175			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 209	< 217	< 213	< 210	N/A	< 544
S96T002731	142	N/A	< 204	< 210	< 207			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	18.6	17.2	17.9	15.2	18.0	39.4
S96T002733	142	N/A	13.4	11.5	12.45			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726I	138	N/A	< 5.62	< 5.46	< 5.54	< 5.40	N/A	1.40
S96T002736I	142	N/A	< 5.48	< 5.04	< 5.26			

Table A-13. Tank 241-S-101 Analytical Results: Copper. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886D	138: 1R	DL	< 4.01	< 4.01	< 4.01	< 4.01	N/A	< 0.180
S96T001909D	138: 2R1	DL	< 4.01	< 4.01	< 4.01			
S96T002043D	138: 3R	DL	< 4.01	< 4.01	< 4.01			

Table A-14. Tank 241-S-101 Analytical Results: Iron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	1,360	8.2	3,530
S96T002040	138: 3AR	Whole	< 1,020	1,010	1,015			
S96T001891	138: 5	Upper ½	< 1,050	2,250	1,650[QC:e]			
S96T001902		Lower ½	910	1,010	960			
S96T002045	138: 6	Upper ½	1,160	1,090	1,125			
S96T002047		Lower ½	1,100	1,380	1,240[QC:e]			
S96T002193	138: 7	Upper ½	1,480	1,530	1,505			
S96T002202		Lower ½	1,810	1,860	1,835			
S96T002046	138: 8	Upper ½	1,890	1,890	1,890			
S96T002048		Lower ½	2,150	2,220	2,185			
S96T002194	138: 9	Upper ½	2,540	2,510	2,525			
S96T002199		Lower ½	1,140	< 1,040	1,090			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	1,220	< 1,030	< 1,125			
S96T002093	142: 5	Upper ½	< 968	< 936	< 952			
S96T002106		Lower ½	1,310	1,010	1,160[QC:e]			

Table A-14. Tank 241-S-101 Analytical Results: Iron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	1,080	1,390	1,235[QC:e]	Cont.	Cont.	Cont.
S96T002091		Lower ½	1,230	1,470	1,350			
S96T002095	142: 7	Upper ½	1,710	1,550	1,630			
S96T002107		Lower ½	1,780	1,860	1,820			
S96T002096	142: 8	Upper ½	2,620	2,350	2,485			
S96T002108		Lower ½	1,860	2,200	2,030			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	470	479	474.5	719	11.1	1,860
S96T001892	138: 5	Upper ½	394	420	407			
S96T001904		Lower ½	384	424	404			
S96T002049	138: 6	Upper ½	499	522	510.5			
S96T002050		Lower ½	632	690	661			
S96T002195	138: 7	Upper ½	786	770	778			
S96T002203		Lower ½	889	1,010	949.5			
S96T002051	138: 8	Upper ½	1,090	1,090	1,090			
S96T002052		Lower ½	1,370	1,360	1,365			
S96T002196	138: 9	Upper ½	1,760	1,680	1,720			
S96T002200		Lower ½	475	484	479.5			
S96T002097	142: 1	Upper ½	418	432	425			
S96T002312	142: 2	Upper ½	462	400	431			
S96T002317		Lower ½	441	450	445.5			

Table A-14. Tank 241-S-101 Analytical Results: Iron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	617	591	604	Cont.	Cont.	Cont.
S96T002320		Lower ½	435	424	429.5			
S96T002109	142: 4	Upper ½	478	504	491			
S96T002110		Lower ½	648	667	657.5			
S96T002111	142: 5	Upper ½	265	361	313[QC:e]			
S96T002112		Lower ½	466	533	499.5			
S96T002113	142: 6	Upper ½	411	478	444.5			
S96T002098		Lower ½	873	1,690	1,281.5[QC:e]			
S96T002114	142: 7	Upper ½	798	845	821.5			
S96T002115		Lower ½	1,160	1,090	1,125			
S96T002116	142: 8	Upper ½	1,380	1,300	1,340			
S96T002117		Lower ½	930	763	846.5			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	1,400	1,330	1,365	1,200	13.8	3,110
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	802	761	781.5	736	6.1	1,910
S96T002733	142	N/A	727	655	691			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726I	138	N/A	< 28.1	< 27.3	< 27.7	< 27.0	N/A	< 70.0
S96T002736I	142	N/A	< 27.4	< 25.2	< 26.3			

Table A-14. Tank 241-S-101 Analytical Results: Iron. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 20.1	< 20.1	< 20.1	< 20.1	N/A	< 52.1
S96T001909	138: 2R1	DL	< 20.1	< 20.1	< 20.1			
S96T002043	138: 3R	DL	< 20.1	< 20.1	< 20.1			

Table A-15. Tank 241-S-101 Analytical Results: Lanthanum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 999	N/A	< 2,590
S96T002040	138: 3AR	Whole	< 1,020	< 954	< 987			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	< 907	< 880	< 893.5			
S96T002045	138: 6	Upper ½	< 959	< 943	< 951			
S96T002047		Lower ½	< 1,040	< 953	< 996.5			
S96T002193	138: 7	Upper ½	< 1,040	< 1,060	< 1,050			
S96T002202		Lower ½	< 998	< 1,000	< 999			
S96T002046	138: 8	Upper ½	< 1,030	< 1,040	< 1,035			
S96T002048		Lower ½	< 946	< 1,020	< 983			
S96T002194	138: 9	Upper ½	< 963	< 1,020	< 991.5			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	< 998	< 1,030	< 1,014			
S96T002093	142: 5	Upper ½	< 968	< 936	< 952			
S96T002106		Lower ½	< 1,020	< 936	< 978			

Table A-15. Tank 241-S-101 Analytical Results: Lanthanum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 1,030	< 1,020	< 1,025			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	< 1,070	< 1,090	< 1,080			
S96T002096	142: 8	Upper ½	< 995	< 991	< 993			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 19.1	< 19.4	< 19.25	< 19.6	N/A	< 50.8
S96T001892	138: 5	Upper ½	< 19.1	< 20.1	< 19.6			
S96T001904		Lower ½	< 17.9	< 19.6	< 18.75			
S96T002049	138: 6	Upper ½	< 18.8	< 19.5	< 19.15			
S96T002050		Lower ½	< 18.5	< 20.4	< 19.45			
S96T002195	138: 7	Upper ½	< 22	< 22.5	< 22.25			
S96T002203		Lower ½	< 19.6	< 20.4	< 20			
S96T002051	138: 8	Upper ½	< 18.5	< 19	< 18.75			
S96T002052		Lower ½	< 19	< 19.6	< 19.3			
S96T002196	138: 9	Upper ½	22.6	24.5	23.55			
S96T002200		Lower ½	< 18.4	< 19.9	< 19.15			
S96T002097	142: 1	Upper ½	< 17.9	< 17.9	< 17.9			
S96T002312	142: 2	Upper ½	< 20.5	< 18.4	< 19.45			
S96T002317		Lower ½	< 18.7	< 19.5	< 19.1			

Table A-15. Tank 241-S-101 Analytical Results: Lanthanum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 20.5	< 20.3	< 20.4	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 20.9	< 20.1	< 20.5			
S96T002109	142: 4	Upper ½	< 20.1	< 20.5	< 20.3			
S96T002110		Lower ½	< 19.7	< 19.3	< 19.5			
S96T002111	142: 5	Upper ½	< 17.7	< 19.3	< 18.5			
S96T002112		Lower ½	< 17.8	< 19.1	< 18.45			
S96T002113	142: 6	Upper ½	< 19.5	< 22.4	< 20.95			
S96T002098		Lower ½	< 19.6	< 20.4	< 20			
S96T002114	142: 7	Upper ½	< 19.8	< 20.1	< 19.95			
S96T002115		Lower ½	< 18.4	< 17.9	< 18.15			
S96T002116	142: 8	Upper ½	19.4	18.3	18.85			
S96T002117		Lower ½	< 18.8	< 18.5	< 18.65			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,050	< 1,090	< 1,070	< 1,050	N/A	< 2,720
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 34.3	< 34.1	< 34.2	< 34.2	N/A	< 88.7
S96T002733	142	N/A	< 33.8	< 31.7	< 32.75			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726I	138	N/A	< 28.1	< 27.3	< 27.7	< 27.0	N/A	< 70.0
S96T002736I	142	N/A	< 27.4	< 25.2	< 26.3			

Table A-15. Tank 241-S-101 Analytical Results: Lanthanum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 20.1	< 20.1	< 20.1	< 20.1	N/A	< 0.905
S96T001909	138: 2R1	DL	< 20.1	< 20.1	< 20.1			
S96T002043	138: 3R	DL	< 20.1	< 20.1	< 20.1			

Table A-16. Tank 241-S-101 Analytical Results: Lead. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-16. Tank 241-S-101 Analytical Results: Lead. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	50.8	53	51.9	< 51.5	N/A	< 133
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	50.8	55.3	53.05			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	56.3	< 47.7[QC:e]			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	73.5	77.5	75.5			
S96T002312	142: 2	Upper ½	80.5	78.2	79.35			
S96T002317		Lower ½	78.9	84.2	81.55			

Table A-16. Tank 241-S-101 Analytical Results: Lead. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	80.4	98.2	89.3			
S96T002109	142: 4	Upper ½	95.4	88	91.7			
S96T002110		Lower ½	65.5	72.7	69.1			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	39.6	< 38.2	38.9			
S96T002113	142: 6	Upper ½	76.5	83.8	80.15			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 68.6	N/A	< 178
S96T002733	142	N/A	< 67.7	69.9	68.8			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726I	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736I	142	N/A	< 54.8	< 50.4	< 52.6			

Table A-16. Tank 241-S-101 Analytical Results: Lead. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-17. Tank 241-S-101 Analytical Results: Magnesium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-17. Tank 241-S-101 Analytical Results: Magnesium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 42.3	N/A	< 110
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	40.7	< 39.15			
S96T002050		Lower ½	46	73.9	59.95[QC:e]			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	52.9	54.8	53.85			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85			
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			

Table A-17. Tank 241-S-101 Analytical Results: Magnesium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	61.7	72.1	66.9			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	41.7	< 38.7			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	72.1	< 55.7[QC:e]			
S96T002114	142: 7	Upper ½	51.9	43.6	47.75			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726I	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736I	142	N/A	< 54.8	< 50.4	< 52.6			

Table A-17. Tank 241-S-101 Analytical Results: Magnesium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-18. Tank 241-S-101 Analytical Results: Manganese. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	224	284	254[QC:e]	1,540	17.8	3,990
S96T002040	138: 3AR	Whole	595	609	602			
S96T001891	138: 5	Upper ½	1,100	1,110	1,105			
S96T001902		Lower ½	1,480	1,540	1,510			
S96T002045	138: 6	Upper ½	1,760	1,730	1,745			
S96T002047		Lower ½	1,750	2,140	1,945			
S96T002193	138: 7	Upper ½	2,330	2,370	2,350			
S96T002202		Lower ½	2,850	2,810	2,830			
S96T002046	138: 8	Upper ½	3,200	3,030	3,115			
S96T002048		Lower ½	3,490	3,500	3,495			
S96T002194	138: 9	Upper ½	3,100	3,140	3,120			
S96T002199		Lower ½	960	809	884.5			
S96T002090	142: 1	Upper ½	265	273	269			
S96T002310	142: 2	Upper ½	279	264	271.5			
S96T002316		Lower ½	313	324	318.5			
S96T002311	142: 3	Upper ½	292	286	289			
S96T002319		Lower ½	299	307	303			
S96T002092	142: 4	Upper ½	356	344	350			
S96T002105		Lower ½	1,100	908	1,004			
S96T002093	142: 5	Upper ½	1,350	1,250	1,300			
S96T002106		Lower ½	1,940	1,560	1,750[QC:e]			

Table A-18. Tank 241-S-101 Analytical Results: Manganese. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	2,100	2,110	2,105	Cont.	Cont.	Cont.
S96T002091		Lower ½	2,260	2,560	2,410			
S96T002095	142: 7	Upper ½	2,720	2,730	2,725			
S96T002107		Lower ½	2,490	3,420	2,955[QC:e]			
S96T002096	142: 8	Upper ½	3,940	3,490	3,715			
S96T002108		Lower ½	1,870	2,160	2,015			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	856	875	865.5	1,440	18.4	3,730
S96T001892	138: 5	Upper ½	1,080	1,150	1,115			
S96T001904		Lower ½	691	761	726			
S96T002049	138: 6	Upper ½	1,360	1,490	1,425			
S96T002050		Lower ½	1,790	1,990	1,890			
S96T002195	138: 7	Upper ½	2,050	2,110	2,080			
S96T002203		Lower ½	2,360	2,570	2,465			
S96T002051	138: 8	Upper ½	2,830	2,730	2,780			
S96T002052		Lower ½	3,170	3,100	3,135			
S96T002196	138: 9	Upper ½	2,400	2,150	2,275			
S96T002200		Lower ½	766	769	767.5			
S96T002097	142: 1	Upper ½	227	226	226.5			
S96T002312	142: 2	Upper ½	230	203	216.5			
S96T002317		Lower ½	231	239	235			

Table A-18. Tank 241-S-101 Analytical Results: Manganese. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	1,800	1,560	1,680	Cont.	Cont.	Cont.
S96T002320		Lower ½	248	251	249.5			
S96T002109	142: 4	Upper ½	286	286	286			
S96T002110		Lower ½	788	802	795			
S96T002111	142: 5	Upper ½	710	1,000	855[QC:e]			
S96T002112		Lower ½	1,360	1,430	1,395			
S96T002113	142: 6	Upper ½	220	257	238.5			
S96T002098		Lower ½	1,960	3,190	2,575[QC:e]			
S96T002114	142: 7	Upper ½	2,210	2,220	2,215			
S96T002115		Lower ½	2,960	2,900	2,930			
S96T002116	142: 8	Upper ½	3,230	3,130	3,180			
S96T002117		Lower ½	1,620	1,260	1,440[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	2,050	2,020	2,035	1,700	19.7	4,410
S96T002731	142	N/A	1,340	1,390	1,365			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	1,960	1,870	1,915	1,580	21.0	4,100
S96T002733	142	N/A	1,310	1,190	1,250			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54	< 5.4	N/A	< 14.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			

Table A-18. Tank 241-S-101 Analytical Results: Manganese. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 4.01	< 4.01	< 4.01	< 4.01	N/A	< 0.180
S96T001909	138: 2R1	DL	< 4.01	< 4.01	< 4.01			
S96T002043	138: 3R	DL	< 4.01	< 4.01	< 4.01			

Table A-19. Tank 241-S-101 Analytical Results: Molybdenum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 999	N/A	< 2,590
S96T002040	138: 3AR	Whole	< 1,020	< 954	< 987			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	< 907	< 880	< 893.5			
S96T002045	138: 6	Upper ½	< 959	< 943	< 951			
S96T002047		Lower ½	< 1,040	< 953	< 996.5			
S96T002193	138: 7	Upper ½	< 1,040	< 1,060	< 1,050			
S96T002202		Lower ½	< 998	< 1,000	< 999			
S96T002046	138: 8	Upper ½	< 1,030	< 1,040	< 1,035			
S96T002048		Lower ½	< 946	< 1,020	< 983			
S96T002194	138: 9	Upper ½	< 963	< 1,020	< 991.5			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	< 998	< 1,030	< 1,014			

Table A-19. Tank 241-S-101 Analytical Results: Molybdenum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 968	< 936	< 952	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 1,020	< 936	< 978			
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025			
S96T002091		Lower ½	< 1,030	< 1,020	< 1,025			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	< 1,070	< 1,090	< 1,080			
S96T002096	142: 8	Upper ½	< 995	< 991	< 993			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	42.6	42	42.3	33.4	13.3	86.8
S96T001892	138: 5	Upper ½	45	45.8	45.4			
S96T001904		Lower ½	39.5	41.9	40.7			
S96T002049	138: 6	Upper ½	30.6	30.2	30.4			
S96T002050		Lower ½	27.7	26.3	27			
S96T002195	138: 7	Upper ½	< 22	< 22.5	< 22.25			
S96T002203		Lower ½	< 19.6	< 20.4	< 20			
S96T002051	138: 8	Upper ½	< 18.5	< 19	< 18.75			
S96T002052		Lower ½	< 19	< 19.6	< 19.3			
S96T002196	138: 9	Upper ½	< 18.5	< 18.2	< 18.35			
S96T002200		Lower ½	< 18.4	< 19.9	< 19.15			
S96T002097	142: 1	Upper ½	47.2	46.3	46.75			

Table A-19. Tank 241-S-101 Analytical Results: Molybdenum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	47.2	40.8	44			
S96T002317		Lower ½	46.8	46.3	46.55			
S96T002313	142: 3	Upper ½	34.5	29.6	32.05			
S96T002320		Lower ½	49.2	50.1	49.65			
S96T002109	142: 4	Upper ½	46.1	46	46.05			
S96T002110		Lower ½	48	49.7	48.85			
S96T002111	142: 5	Upper ½	47.3	44.3	45.8			
S96T002112		Lower ½	37.6	36.3	36.95			
S96T002113	142: 6	Upper ½	45.2	50.3	47.75			
S96T002098		Lower ½	26.3	42.8	34.55[QC:e]			
S96T002114	142: 7	Upper ½	21.6	21.6	21.6			
S96T002115		Lower ½	< 18.4	< 17.9	< 18.15			
S96T002116	142: 8	Upper ½	< 18.5	< 18.0	< 18.25			
S96T002117		Lower ½	< 18.8	< 18.5	< 18.65			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,050	< 1,090	< 1,070	< 1,050	N/A	< 2,720
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 34.3	< 34.1	< 34.2	34.2	0.7	88.7
S96T002733	142	N/A	34.8	33.6	34.2			

Table A-19. Tank 241-S-101 Analytical Results: Molybdenum. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 28.1	< 27.3	< 27.7	< 28.9	N/A	74.9
S96T002736	142	N/A	34.8	< 25.2	30[QC:e]			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	86.7	87.2	86.95	84.6	3.2	3.81
S96T001909	138: 2R1	DL	86.5	88.8	87.65			
S96T002043	138: 3R	DL	79.6	78.9	79.25			

Table A-20. Tank 241-S-101 Analytical Results: Neodymium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			

Table A-20. Tank 241-S-101 Analytical Results: Neodymium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050			
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 41.6	N/A	< 108
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	43.1	41.6	42.35			
S96T002052		Lower ½	48.2	47.2	47.7			
S96T002196	138: 9	Upper ½	60.9	68.6	64.75			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			

Table A-20. Tank 241-S-101 Analytical Results: Neodymium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75			
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	< 39.3	< 38.6	< 38.95			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	50.9	< 45.1[QC:e]			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	44.6	43.9	44.25			
S96T002116	142: 8	Upper ½	52	50.4	51.2			
S96T002117		Lower ½	45.5	< 37	< 41.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			

Table A-20. Tank 241-S-101 Analytical Results: Neodymium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-21. Tank 241-S-101 Analytical Results: Nickel. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	6,590	6,330	6,460	7,790	19.2	20,200
S96T002040	138: 3AR	Whole	4,570	3,880	4,225			
S96T001891	138: 5	Upper ½	7,660	11,600	9,630[QC:e]			
S96T001902		Lower ½	10,100	7,950	9,025[QC:e]			
S96T002045	138: 6	Upper ½	2,420	2,980	2,700			
S96T002047		Lower ½	8,510	2,850	5,680[QC:e]			
S96T002193	138: 7	Upper ½	3,240	11,500	7,370[QC:e]			
S96T002202		Lower ½	2,860	2,600	2,730			
S96T002046	138: 8	Upper ½	84,600	3,700	44,150[QC:e]			
S96T002048		Lower ½	8,620	6,200	7,410[QC:e]			
S96T002194	138: 9	Upper ½	2,280	8,740	5,510[QC:e]			
S96T002199		Lower ½	2,500	6,040	4,270[QC:e]			
S96T002090	142: 1	Upper ½	6,490	4,310	5,400[QC:e]			
S96T002310	142: 2	Upper ½	4,210	5,550	4,880[QC:e]			
S96T002316		Lower ½	4,810	2,830	3,820[QC:e]			
S96T002311	142: 3	Upper ½	7,380	9,400	8,390[QC:e]			
S96T002319		Lower ½	2,600	1,510	2,055[QC:e]			
S96T002092	142: 4	Upper ½	2,250	7,230	4,740[QC:e]			
S96T002105		Lower ½	7,650	10,100	8,875[QC:e]			

Table A-21. Tank 241-S-101 Analytical Results: Nickel. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	5,080	7,120	6,100[QC:e]	Cont.	Cont.	Cont.
S96T002106		Lower ½	4,470	3,550	4,010[QC:e]			
S96T002094	142: 6	Upper ½	13,200	10,300	11,750[QC:e]			
S96T002091		Lower ½	6,050	14,300	10,175[QC:e]			
S96T002095	142: 7	Upper ½	12,600	14,900	13,750			
S96T002107		Lower ½	3,230	3,650	3,440			
S96T002096	142: 8	Upper ½	9,490	4,590	7,040[QC:e]			
S96T002108		Lower ½	12,100	13,000	12,550			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	89.5	93.8	91.65	89.9	13.8	233
S96T001892	138: 5	Upper ½	56	59.6	57.8			
S96T001904		Lower ½	65.2	71.8	68.5			
S96T002049	138: 6	Upper ½	50.4	52.8	51.6			
S96T002050		Lower ½	58	61.4	59.7			
S96T002195	138: 7	Upper ½	67	64	65.5			
S96T002203		Lower ½	71.7	80.6	76.15			
S96T002051	138: 8	Upper ½	87.5	80.8	84.15			
S96T002052		Lower ½	97.6	94.1	95.85			
S96T002196	138: 9	Upper ½	154	158	156			
S96T002200		Lower ½	39.7	39.4	39.55			
S96T002097	142: 1	Upper ½	135	132	133.5			

Table A-21. Tank 241-S-101 Analytical Results: Nickel. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	146	129	137.5	Cont.	Cont.	Cont.
S96T002317		Lower ½	136	143	139.5			
S96T002313	142: 3	Upper ½	61.9	53.6	57.75			
S96T002320		Lower ½	126	128	127			
S96T002109	142: 4	Upper ½	157	160	158.5			
S96T002110		Lower ½	88.2	90	89.1			
S96T002111	142: 5	Upper ½	38	55.5	46.75[QC:e]			
S96T002112		Lower ½	63.8	69.7	66.75			
S96T002113	142: 6	Upper ½	129	149	139			
S96T002098		Lower ½	61.7	102	81.85[QC:e]			
S96T002114	142: 7	Upper ½	66.6	67.5	67.05			
S96T002115		Lower ½	91.7	84.8	88.25			
S96T002116	142: 8	Upper ½	105	98.2	101.6			
S96T002117		Lower ½	104	81.6	92.8[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	1,490	3,100	2,295[QC:e]	3,350	31.4	8,680
S96T002731	142	N/A	4,750	4,050	4,400			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	73.2	72.2	72.7	79.0	8.0	205
S96T002733	142	N/A	89.2	81.4	85.3			

Table A-21. Tank 241-S-101 Analytical Results: Nickel. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 11.2	< 10.9	< 11.05	< 10.8	N/A	< 28.0
S96T002736	142	N/A	< 11	< 10.1	< 10.55			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 8.02	< 8.02	< 8.02	< 8.02	N/A	< 0.361
S96T001909	138: 2R1	DL	< 8.02	< 8.02	< 8.02			
S96T002043	138: 3R	DL	< 8.02	< 8.02	< 8.02			

Table A-21. Tank 241-S-101 Analytical Results: Phosphorus. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 3,930	< 3,720	< 3,825	< 4,140	N/A	< 10,700
S96T002040	138: 3AR	Whole	7,950	7,490	7,720			
S96T001891	138: 5	Upper ½	< 4,200	< 4,230	< 4,215			
S96T001902		Lower ½	< 3,630	< 3,520	< 3,575			
S96T002045	138: 6	Upper ½	< 3,830	< 3,770	< 3,800			
S96T002047		Lower ½	< 4,150	< 3,810	< 3,980			
S96T002193	138: 7	Upper ½	< 4,160	< 4,250	< 4,205			
S96T002202		Lower ½	< 3,990	< 4,010	< 4,000			
S96T002046	138: 8	Upper ½	< 4,100	< 4,170	< 4,135			
S96T002048		Lower ½	< 3,780	< 4,080	< 3,930			
S96T002194	138: 9	Upper ½	< 3,850	< 4,100	< 3,975			
S96T002199		Lower ½	< 4,250	< 4,150	< 4,200			
S96T002090	142: 1	Upper ½	< 4,110	< 4,100	< 4,105			
S96T002310	142: 2	Upper ½	< 3,750	< 3,690	< 3,720			
S96T002316		Lower ½	< 4,080	4,130	< 4,105			
S96T002311	142: 3	Upper ½	< 4,040	< 4,110	< 4,075			
S96T002319		Lower ½	< 3,910	< 3,820	< 3,865			
S96T002092	142: 4	Upper ½	< 4,030	< 3,990	< 4,010			
S96T002105		Lower ½	< 3,990	< 4,120	< 4,055			

Table A-21. Tank 241-S-101 Analytical Results: Phosphorus. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 3,870	< 3,740	< 3,805	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 4,090	< 3,750	< 3,920			
S96T002094	142: 6	Upper ½	< 4,150	< 4,050	< 4,100			
S96T002091		Lower ½	< 4,120	< 4,090	< 4,105			
S96T002095	142: 7	Upper ½	< 3,970	< 4,010	< 3,990			
S96T002107		Lower ½	< 4,290	< 4,350	< 4,320			
S96T002096	142: 8	Upper ½	< 3,980	< 3,970	< 3,975			
S96T002108		Lower ½	< 4,080	< 3,990	< 4,035			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	1,930	1,940	1,935	1,400	24.5	3,630
S96T001892	138: 5	Upper ½	1,960	2,090	2,025			
S96T001904		Lower ½	1,690	1,870	1,780			
S96T002049	138: 6	Upper ½	1,400	1,510	1,455			
S96T002050		Lower ½	1,220	1,280	1,250			
S96T002195	138: 7	Upper ½	888	891	889.5			
S96T002203		Lower ½	622	677	649.5			
S96T002051	138: 8	Upper ½	422	422	422			
S96T002052		Lower ½	253	244	248.5			
S96T002196	138: 9	Upper ½	119	111	115			
S96T002200		Lower ½	< 73.6	< 79.6	< 76.6			
S96T002097	142: 1	Upper ½	1,990	1,800	1,895			

Table A-21. Tank 241-S-101 Analytical Results: Phosphorus. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	2,820	2,640	2,730	Cont.	Cont.	Cont.
S96T002317		Lower ½	3,420	3,690	3,555			
S96T002313	142: 3	Upper ½	1,470	1,250	1,360			
S96T002320		Lower ½	2,380	2,000	2,190			
S96T002109	142: 4	Upper ½	3,170	3,490	3,330			
S96T002110		Lower ½	1,930	2,050	1,990			
S96T002111	142: 5	Upper ½	1,290	1,520	1,405			
S96T002112		Lower ½	1,580	1,620	1,600			
S96T002113	142: 6	Upper ½	2,720	3,730	3,225[QC:e]			
S96T002098		Lower ½	1,050	1,680	1,365[QC:e]			
S96T002114	142: 7	Upper ½	741	734	737.5			
S96T002115		Lower ½	396	383	389.5			
S96T002116	142: 8	Upper ½	142	133	137.5			
S96T002117		Lower ½	104	95.4	99.7			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 4,180	< 4,340	< 4,260	< 4,200	N/A	< 10,900
S96T002731	142	N/A	< 4,080	< 4,210	< 4,145			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	1,050	1,110	1,080	1,470	26.3	3,810
S96T002733	142	N/A	2,060	1,640	1,850[QC:e]			

Table A-21. Tank 241-S-101 Analytical Results: Phosphorus. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	1,060	831	945.5[QC:e]	1,290	26.9	3,340
S96T002736	142	N/A	2,070	1,210	1,640[QC:e]			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	1,140	1,140	1,140	1,260	7.7	56.7
S96T001909	138: 2R1	DL	1,180	1,190	1,185			
S96T002043	138: 3R	DL	1,450	1,450	1,450			

Table A-22. Tank 241-S-101 Analytical Results: Potassium. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	1,240	1,320	1,280	926	10.2	2,400
S96T001892	138: 5	Upper ½	1,180	1,320	1,250			
S96T001904		Lower ½	1,210	1,280	1,245			
S96T002049	138: 6	Upper ½	895	811	853			
S96T002050		Lower ½	826	767	796.5			
S96T002195	138: 7	Upper ½	665	667	666			
S96T002203		Lower ½	600	607	603.5			
S96T002051	138: 8	Upper ½	518	508	513			
S96T002052		Lower ½	559	461	510			
S96T002196	138: 9	Upper ½	401	402	401.5			
S96T002200		Lower ½	469	490	479.5			
S96T002097	142: 1	Upper ½	1,260	1,230	1,245			
S96T002312	142: 2	Upper ½	1,220	1,120	1,170			
S96T002317		Lower ½	1,230	1,200	1,215			
S96T002313	142: 3	Upper ½	894	740	817			
S96T002320		Lower ½	1,320	1,290	1,305			
S96T002109	142: 4	Upper ½	1,150	1,260	1,205			
S96T002110		Lower ½	1,160	1,240	1,200			
S96T002111	142: 5	Upper ½	1,190	1,080	1,135			
S96T002112		Lower ½	946	996	971			

Table A-22. Tank 241-S-101 Analytical Results: Potassium. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002113	142: 6	Upper ½	1,190	1,310	1,250	Cont.	Cont.	Cont.
S96T002098		Lower ½	750	1,190	970[QC:e]			
S96T002114	142: 7	Upper ½	732	760	746			
S96T002115		Lower ½	607	544	575.5			
S96T002116	142: 8	Upper ½	530	520	525			
S96T002117		Lower ½	524	593	558.5			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	807	771	789	880	10.4	2,280
S96T002733	142	N/A	1,000	943	971.5			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	788	765	776.5	916	15.2	2,370
S96T002736	142	N/A	1,060	1,050	1,055			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	2,490	2,460	2,475	2,360	6.5	106
S96T001909	138: 2R1	DL	2,510	2,590	2,550			
S96T002043	138: 3R	DL	2,010	2,100	2,055			

Table A-23. Tank 241-S-101 Analytical Results: Samarium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			

Table A-23. Tank 241-S-101 Analytical Results: Samarium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050			
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 38.7	N/A	< 100
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			

Table A-23. Tank 241-S-101 Analytical Results: Samarium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75			
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	< 39.3	< 38.6	< 38.95			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,440
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			

Table A-23. Tank 241-S-101 Analytical Results: Samarium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 40.1	N/A	< 1.80
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	< 40.1	< 40.1	< 40.1			

Table A-24. Tank 241-S-101 Analytical Results: Selenium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 1,970	< 1,860	< 1,915	< 2,000	N/A	< 5,180
S96T002040	138: 3AR	Whole	< 2,040	< 1,910	< 1,975			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	< 2,060	< 2,050	< 2,055			
S96T002310	142: 2	Upper ½	< 1,880	< 1,850	< 1,865			
S96T002316		Lower ½	< 2,040	< 2,030	< 2,035			
S96T002311	142: 3	Upper ½	< 2,020	< 2,060	< 2,040			
S96T002319		Lower ½	< 1,950	< 1,910	< 1,930			
S96T002092	142: 4	Upper ½	< 2,020	< 2,000	< 2,010			
S96T002105		Lower ½	< 2,000	< 2,060	< 2,030			

Table A-24. Tank 241-S-101 Analytical Results: Selenium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050			
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 38.1	< 38.7	< 38.4	< 38.7	N/A	< 100
S96T001892	138: 5	Upper ½	< 38.2	< 40.3	< 39.25			
S96T001904		Lower ½	< 35.8	< 39.2	< 37.5			
S96T002049	138: 6	Upper ½	< 37.6	< 38.9	< 38.25			
S96T002050		Lower ½	< 37.1	< 40.9	< 39			
S96T002195	138: 7	Upper ½	< 44	< 44.9	< 44.45			
S96T002203		Lower ½	< 39.1	< 40.8	< 39.95			
S96T002051	138: 8	Upper ½	< 36.9	< 38	< 37.45			
S96T002052		Lower ½	< 37.9	< 39.1	< 38.5			
S96T002196	138: 9	Upper ½	< 36.9	< 36.4	< 36.65			
S96T002200		Lower ½	< 36.8	< 39.8	< 38.3			
S96T002097	142: 1	Upper ½	< 35.7	< 35.7	< 35.7			

Table A-24. Tank 241-S-101 Analytical Results: Selenium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	< 40.9	< 36.8	< 38.85	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 37.3	< 39.1	< 38.2			
S96T002313	142: 3	Upper ½	< 41	< 40.5	< 40.75			
S96T002320		Lower ½	< 41.7	< 40.1	< 40.9			
S96T002109	142: 4	Upper ½	< 40.1	< 40.9	< 40.5			
S96T002110		Lower ½	< 39.3	< 38.6	< 38.95			
S96T002111	142: 5	Upper ½	< 35.3	< 38.6	< 36.95			
S96T002112		Lower ½	< 35.7	< 38.2	< 36.95			
S96T002113	142: 6	Upper ½	< 38.9	< 44.8	< 41.85			
S96T002098		Lower ½	< 39.3	< 40.8	< 40.05			
S96T002114	142: 7	Upper ½	< 39.6	< 40.2	< 39.9			
S96T002115		Lower ½	< 36.7	< 35.8	< 36.25			
S96T002116	142: 8	Upper ½	< 37.1	< 36	< 36.55			
S96T002117		Lower ½	< 37.5	< 37	< 37.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	< 2,100	N/A	< 5,180
S96T002731	142	N/A	< 2,040	< 2,100	< 2,070			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 68.6	< 68.2	< 68.4	< 67.0	N/A	< 174
S96T002733	142	N/A	< 67.7	< 63.5	< 65.6			

Table A-24. Tank 241-S-101 Analytical Results: Selenium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 56.2	< 54.6	< 55.4	< 54.0	N/A	< 140
S96T002736	142	N/A	< 54.8	< 50.4	< 52.6			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	< 40.1	< 40.1	< 40.1	< 43.0	N/A	< 1.94
S96T001909	138: 2R1	DL	< 40.1	< 40.1	< 40.1			
S96T002043	138: 3R	DL	52.7	44.7	48.7			

Table A-25. Tank 241-S-101 Analytical Results: Silicon. (4 sheets)

Sample Number	Sample Location	Segment Portion	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 1,390	N/A	< 3,600
S96T002040	138: 3AR	Whole	1,650	1,530	1,590			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	1,310	1,150	1,230			
S96T002045	138: 6	Upper ½	991	1,070	1,030.5			
S96T002047		Lower ½	1,110	1,310	1,210			
S96T002193	138: 7	Upper ½	< 1,040	1,180	1,110			
S96T002202		Lower ½	1,490	1,230	1,360			
S96T002046	138: 8	Upper ½	1,350	1,280	1,315			
S96T002048		Lower ½	1,360	1,120	1,240			
S96T002194	138: 9	Upper ½	1,150	1,110	1,130			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	9,540	< 999	5,269.5[QC:e]			
S96T002105		Lower ½	3,290	2,250	2,770[QC:e]			

Table A-25. Tank 241-S-101 Analytical Results: Silicon. (4 sheets)

Sample Number	Sample Location	Segment Portion	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 968	< 936	< 952	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 1,020	< 936	< 978			
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025			
S96T002091		Lower ½	1,490	< 1,020	1,255[QC:e]			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	4,330	1,480	2,905[QC:e]			
S96T002096	142: 8	Upper ½	1,420	1,080	1,250[QC:e]			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	2,230	1,340	1,785[QC:e]	2,350	36.3	6,090
S96T002731	142	N/A	1,030	4,790	2,910[QC:e]			
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	133	169	151[QC:e]	157	5.5	407
S96T002736	142	N/A	170	156	163			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	134	133	133.5	164	19.3	7.38
S96T001909	138: 2R1	DL	128	133	130.5			
S96T002043	138: 3R	DL	226	227	226.5			

Table A-26. Tank 241-S-101 Analytical Results: Silver. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	< 200	N/A	< 518
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	< 181	< 176	< 178.5			
S96T002045	138: 6	Upper ½	< 192	< 189	< 190.5			
S96T002047		Lower ½	< 207	< 191	< 199			
S96T002193	138: 7	Upper ½	< 208	< 212	< 210			
S96T002202		Lower ½	< 200	< 200	< 200			
S96T002046	138: 8	Upper ½	< 205	< 209	< 207			
S96T002048		Lower ½	< 189	< 204	< 196.5			
S96T002194	138: 9	Upper ½	< 193	< 205	< 199			
S96T002199		Lower ½	< 213	< 208	< 210.5			
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5			
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5			
S96T002316		Lower ½	< 204	< 203	< 203.5			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	< 204	< 187	< 195.5			

Table A-26. Tank 241-S-101 Analytical Results: Silver. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 207	< 203	< 205	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 206	< 205	< 205.5			
S96T002095	142: 7	Upper ½	< 199	< 201	< 200			
S96T002107		Lower ½	< 215	< 217	< 216			
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5			
S96T002108		Lower ½	< 204	< 200	< 202			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	11.9	11.8	11.85	10.9	6.2	28.3
S96T001892	138: 5	Upper ½	10.8	11.3	11.05			
S96T001904		Lower ½	11.4	12.5	11.95			
S96T002049	138: 6	Upper ½	9.44	8.9	9.17			
S96T002050		Lower ½	9.6	9.99	9.795			
S96T002195	138: 7	Upper ½	9.69	9.09	9.39			
S96T002203		Lower ½	9.47	9.75	9.61			
S96T002051	138: 8	Upper ½	9.82	9.21	9.515			
S96T002052		Lower ½	9.55	9.57	9.56			
S96T002196	138: 9	Upper ½	10.2	10.4	10.3			
S96T002200		Lower ½	9.44	9.23	9.335			
S96T002097	142: 1	Upper ½	12.4	12.6	12.5			

Table A-26. Tank 241-S-101 Analytical Results: Silver. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	13.7	12	12.85	Cont.	Cont.	Cont.
S96T002317		Lower ½	13.9	14.1	14			
S96T002313	142: 3	Upper ½	9.62	8.45	9.035			
S96T002320		Lower ½	13.4	13	13.2			
S96T002109	142: 4	Upper ½	14.1	14	14.05			
S96T002110		Lower ½	13.2	12.6	12.9			
S96T002111	142: 5	Upper ½	10.1	9.82	9.96			
S96T002112		Lower ½	9.33	9.55	9.44			
S96T002113	142: 6	Upper ½	13.5	15.2	14.35			
S96T002098		Lower ½	8.92	14.8	11.86[QC:e]			
S96T002114	142: 7	Upper ½	9.83	9.67	9.75			
S96T002115		Lower ½	9.72	9.59	9.655			
S96T002116	142: 8	Upper ½	10.5	9.44	9.97			
S96T002117		Lower ½	9.84	9.28	9.56			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 209	< 217	< 213	< 210	N/A	< 544
S96T002731	142	N/A	< 204	< 210	< 207			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 6.86	< 6.82	< 6.84	< 6.76	N/A	< 17.5
S96T002733	142	N/A	7.02	< 6.35	6.685			

Table A-26. Tank 241-S-101 Analytical Results: Silver. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54	< 5.40	N/A	< 14.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	15.2	15.3	15.25	15.3	1.1	0.689
S96T001909	138: 2R1	DL	15.6	15.6	15.6			
S96T002043	138: 3R	DL	15.2	14.8	15.0			

Table A-27. Tank 241-S-101 Analytical Results: Sodium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	1.480E+05	1.760E+05	1.620E+05	1.49E+05	4.8	3.86E+05
S96T002040	138: 3AR	Whole	1.690E+05	1.700E+05	1.695E+05			
S96T001891	138: 5	Upper ½	1.500E+05	1.510E+05	1.505E+05			
S96T001902		Lower ½	1.410E+05	1.410E+05	1.410E+05			
S96T002045	138: 6	Upper ½	1.400E+05	1.390E+05	1.395E+05			
S96T002047		Lower ½	1.090E+05	1.380E+05	1.235E+05[QC:e]			
S96T002193	138: 7	Upper ½	1.350E+05	1.370E+05	1.360E+05			
S96T002202		Lower ½	1.300E+05	1.330E+05	1.315E+05			
S96T002046	138: 8	Upper ½	1.290E+05	1.280E+05	1.285E+05			
S96T002048		Lower ½	1.280E+05	1.300E+05	1.290E+05			
S96T002194	138: 9	Upper ½	1.150E+05	1.160E+05	1.155E+05			
S96T002199		Lower ½	1.260E+05	1.250E+05	1.255E+05			
S96T002090	142: 1	Upper ½	1.780E+05	1.770E+05	1.775E+05			
S96T002310	142: 2	Upper ½	1.790E+05	1.740E+05	1.765E+05			
S96T002316		Lower ½	2.070E+05	2.050E+05	2.060E+05			
S96T002311	142: 3	Upper ½	1.960E+05	1.960E+05	1.960E+05			
S96T002319		Lower ½	1.890E+05	1.850E+05	1.870E+05			
S96T002092	142: 4	Upper ½	1.960E+05	1.960E+05	1.960E+05			
S96T002105		Lower ½	1.600E+05	1.620E+05	1.610E+05			

Table A-27. Tank 241-S-101 Analytical Results: Sodium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	1.390E+05	1.380E+05	1.385E+05			
S96T002106		Lower ½	1.490E+05	1.270E+05	1.380E+05			
S96T002094	142: 6	Upper ½	1.330E+05	1.280E+05	1.305E+05	Cont.	Cont.	Cont.
S96T002091		Lower ½	1.180E+05	1.280E+05	1.230E+05			
S96T002095	142: 7	Upper ½	1.220E+05	1.250E+05	1.235E+05			
S96T002107		Lower ½	92,500	1.270E+05	1.098E+05[QC:e]			
S96T002096	142: 8	Upper ½	1.220E+05	1.220E+05	1.220E+05			
S96T002108		Lower ½	1.300E+05	1.240E+05	1.270E+05			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	1.480E+05	1.510E+05	1.495E+05	1.31E+05	6.1	3.40E+05
S96T001892	138: 5	Upper ½	1.380E+05	1.460E+05	1.420E+05			
S96T001904		Lower ½	1.370E+05	1.500E+05	1.435E+05			
S96T002049	138: 6	Upper ½	1.220E+05	1.210E+05	1.215E+05			
S96T002050		Lower ½	1.230E+05	1.230E+05	1.230E+05			
S96T002195	138: 7	Upper ½	1.150E+05	1.160E+05	1.155E+05			
S96T002203		Lower ½	1.080E+05	1.160E+05	1.120E+05			
S96T002051	138: 8	Upper ½	1.100E+05	1.090E+05	1.095E+05			
S96T002052		Lower ½	1.090E+05	1.070E+05	1.080E+05			
S96T002196	138: 9	Upper ½	1.020E+05	1.000E+05	1.010E+05			
S96T002200		Lower ½	1.060E+05	1.070E+05	1.065E+05			

Table A-27. Tank 241-S-101 Analytical Results: Sodium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002097	142: 1	Upper ½	1.570E+05	1.550E+05	1.560E+05			
S96T002312	142: 2	Upper ½	1.680E+05	1.460E+05	1.570E+05			
S96T002317		Lower ½	1.720E+05	1.710E+05	1.715E+05			
S96T002313	142: 3	Upper ½	1.200E+05	1.050E+05	1.125E+05	Cont.	Cont.	Cont.
S96T002320		Lower ½	1.620E+05	1.610E+05	1.615E+05			
S96T002109	142: 4	Upper ½	1.690E+05	1.690E+05	1.690E+05			
S96T002110		Lower ½	1.400E+05	1.400E+05	1.400E+05			
S96T002111	142: 5	Upper ½	1.280E+05	1.260E+05	1.270E+05			
S96T002112		Lower ½	1.160E+05	1.140E+05	1.150E+05			
S96T002113	142: 6	Upper ½	1.550E+05	1.820E+05	1.685E+05			
S96T002098		Lower ½	1.120E+05	1.750E+05	1.435E+05[QC:d,e]			
S96T002114	142: 7	Upper ½	1.170E+05	1.170E+05	1.170E+05			
S96T002115		Lower ½	1.110E+05	1.090E+05	1.100E+05			
S96T002116	142: 8	Upper ½	1.080E+05	1.050E+05	1.065E+05			
S96T002117		Lower ½	1.160E+05	1.130E+05	1.145E+05			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	1.620E+05	1.870E+05	1.745E+05	1.91E+05	8.6	4.95E+05
S96T002731	142	N/A	2.090E+05	2.060E+05	2.075E+05			

Table A-27. Tank 241-S-101 Analytical Results: Sodium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: acid digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002724	138	N/A	1.130E+05	1.110E+05	1.120E+05	1.21E+05	7.4	3.14E+05
S96T002733	142	N/A	1.370E+05	1.230E+05	1.300E+05			
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	1.220E+05	1.170E+05	1.195E+05	1.35E+05	11.3	3.50E+05
S96T002736	142	N/A	1.480E+05	1.520E+05	1.500E+05[QC:d]			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	2.140E+05	2.140E+05	2.140E+05[QC:d]	2.15E+05	0.7	9,680
S96T001909	138: 2R1	DL	2.160E+05	2.190E+05	2.175E+05			
S96T002043	138: 3R	DL	2.140E+05	2.110E+05	2.125E+05[QC:d]			

Table A-28. Tank 241-S-101 Analytical Results: Strontium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	292	10.9	757
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	216	219	217.5			
S96T002045	138: 6	Upper ½	235	228	231.5			
S96T002047		Lower ½	234	291	262.5[QC:e]			
S96T002193	138: 7	Upper ½	319	325	322			
S96T002202		Lower ½	390	384	387			
S96T002046	138: 8	Upper ½	415	418	416.5			
S96T002048		Lower ½	478	479	478.5			
S96T002194	138: 9	Upper ½	585	573	579			
S96T002199		Lower ½	255	216	235.5			
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5			
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5			
S96T002316		Lower ½	< 204	< 203	< 203.5			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	264	216	240			

Table A-28. Tank 241-S-101 Analytical Results: Strontium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	279	274	276.5	Cont.	Cont.	Cont.
S96T002091		Lower ½	301	340	320.5			
S96T002095	142: 7	Upper ½	352	360	356			
S96T002107		Lower ½	326	454	390[QC:e]			
S96T002096	142: 8	Upper ½	550	594	572			
S96T002108		Lower ½	520	712	616[QC:e]			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	91.6	93.6	92.6	195	26.5	505
S96T001892	138: 5	Upper ½	128	136	132			
S96T001904		Lower ½	75.5	83	79.25			
S96T002049	138: 6	Upper ½	158	171	164.5			
S96T002050		Lower ½	209	233	221			
S96T002195	138: 7	Upper ½	242	246	244			
S96T002203		Lower ½	281	302	291.5			
S96T002051	138: 8	Upper ½	338	332	335			
S96T002052		Lower ½	389	377	383			
S96T002196	138: 9	Upper ½	639	720	679.5			
S96T002200		Lower ½	187	186	186.5			
S96T002097	142: 1	Upper ½	3.68	3.68	3.68			
S96T002312	142: 2	Upper ½	< 4.09	< 3.68	< 3.885			
S96T002317		Lower ½	< 3.73	< 3.91	< 3.82			

Table A-28. Tank 241-S-101 Analytical Results: Strontium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	216	186	201	Cont.	Cont.	Cont.
S96T002320		Lower ½	5.84	5.78	5.81			
S96T002109	142: 4	Upper ½	7.5	7.61	7.555			
S96T002110		Lower ½	70.9	71.9	71.4			
S96T002111	142: 5	Upper ½	88.8	122	105.4[QC:e]			
S96T002112		Lower ½	171	171	171			
S96T002113	142: 6	Upper ½	3.95	4.73	4.34			
S96T002098		Lower ½	234	391	312.5[QC:e]			
S96T002114	142: 7	Upper ½	262	265	263.5			
S96T002115		Lower ½	342	334	338			
S96T002116	142: 8	Upper ½	443	427	435			
S96T002117		Lower ½	399	254	326.5[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	343	349	346	289	19.7	749
S96T002731	142	N/A	232	232	232			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	249	242	245.5	200	22.9	518
S96T002733	142	N/A	163	145	154			

Table A-28. Tank 241-S-101 Analytical Results: Strontium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54	< 5.40	N/A	< 14.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 4.01	< 4.01	< 4.01	< 4.01	N/A	< 0.180
S96T001909	138: 2R1	DL	< 4.01	< 4.01	< 4.01			
S96T002043	138: 3R	DL	< 4.01	< 4.01	< 4.01			

Table A-29. Tank 241-S-101 Analytical Results: Sulfur. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	4,390	5,550	4,970[QC:e]	< 3,600	N/A	< 9,330
S96T002040	138: 3AR	Whole	9,270	9,600	9,435			
S96T001891	138: 5	Upper ½	< 2,100	< 2,120	< 2,110			
S96T001902		Lower ½	< 1,810	< 1,760	< 1,785			
S96T002045	138: 6	Upper ½	< 1,920	< 1,890	< 1,905			
S96T002047		Lower ½	< 2,070	< 1,910	< 1,990			
S96T002193	138: 7	Upper ½	< 2,080	< 2,120	< 2,100			
S96T002202		Lower ½	< 2,000	< 2,000	< 2,000			
S96T002046	138: 8	Upper ½	< 2,050	< 2,090	< 2,070			
S96T002048		Lower ½	< 1,890	< 2,040	< 1,965			
S96T002194	138: 9	Upper ½	< 1,930	< 2,050	< 1,990			
S96T002199		Lower ½	< 2,130	< 2,080	< 2,105			
S96T002090	142: 1	Upper ½	6,330	6,240	6,285			
S96T002310	142: 2	Upper ½	8,150	7,620	7,885			
S96T002316		Lower ½	9,050	8,790	8,920			
S96T002311	142: 3	Upper ½	7,400	7,310	7,355			
S96T002319		Lower ½	6,710	6,540	6,625			
S96T002092	142: 4	Upper ½	7,380	7,230	7,305			
S96T002105		Lower ½	2,520	2,200	2,360			
S96T002093	142: 5	Upper ½	< 1,940	< 1,870	< 1,905			
S96T002106		Lower ½	< 2,040	< 1,870	< 1,955			

Table A-29. Tank 241-S-101 Analytical Results: Sulfur. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 2,070	< 2,030	< 2,050	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 2,060	< 2,050	< 2,055			
S96T002095	142: 7	Upper ½	< 1,990	< 2,010	< 2,000			
S96T002107		Lower ½	< 2,150	< 2,170	< 2,160			
S96T002096	142: 8	Upper ½	< 1,990	< 1,980	< 1,985			
S96T002108		Lower ½	< 2,040	< 2,000	< 2,020			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	2,870	2,930	2,900	1,960	50.9	5,080
S96T001892	138: 5	Upper ½	724	766	745			
S96T001904		Lower ½	2,620	2,890	2,755			
S96T002049	138: 6	Upper ½	423	429	426			
S96T002050		Lower ½	423	417	420			
S96T002195	138: 7	Upper ½	396	381	388.5			
S96T002203		Lower ½	367	387	377			
S96T002051	138: 8	Upper ½	343	351	347			
S96T002052		Lower ½	359	351	355			
S96T002196	138: 9	Upper ½	314	321	317.5			
S96T002200		Lower ½	350	357	353.5			
S96T002097	142: 1	Upper ½	5,700	5,660	5,680			
S96T002312	142: 2	Upper ½	6,950	6,100	6,525			
S96T002317		Lower ½	6,990	7,100	7,045			

Table A-29. Tank 241-S-101 Analytical Results: Sulfur. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	396	328	362	Cont.	Cont.	Cont.
S96T002320		Lower ½	5,450	5,450	5,450			
S96T002109	142: 4	Upper ½	6,580	6,270	6,425			
S96T002110		Lower ½	2,050	2,120	2,085			
S96T002111	142: 5	Upper ½	452	423	437.5			
S96T002112		Lower ½	365	358	361.5			
S96T002113	142: 6	Upper ½	5,900	7,110	6,505			
S96T002098		Lower ½	356	566	461[QC:e]			
S96T002114	142: 7	Upper ½	345	348	346.5			
S96T002115		Lower ½	347	330	338.5			
S96T002116	142: 8	Upper ½	328	319	323.5			
S96T002117		Lower ½	356	362	359			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 2,090	< 2,170	< 2,130	2,530	15.8	6,560
S96T002731	142	N/A	2,890	2,970	2,930			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/	437	431	434	1,610	73.1	4,170
S96T002733	142	N/A	2,940	2,650	2,795			

Table A-29. Tank 241-S-101 Analytical Results: Sulfur. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	452	412	432	1,650	73.8	4,280
S96T002736	142	N/A	3,120	2,610	2,865			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	1,720	1,720	1,720	1,860	5.1	83.7
S96T001909	138: 2R1	DL	1,820	1,830	1,825			
S96T002043	138: 3R	DL	2,060	2,020	2,040			

Table A-31. Tank 241-S-101 Analytical Results: Thallium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 3,930	< 3,720	< 3,825	< 4,000	N/A	< 10,400
S96T002040	138: 3AR	Whole	< 4,070	< 3,810	< 3,940			
S96T001891	138: 5	Upper ½	< 4,200	< 4,230	< 4,215			
S96T001902		Lower ½	< 3,630	< 3,520	< 3,575			
S96T002045	138: 6	Upper ½	< 3,830	< 3,770	< 3,800			
S96T002047		Lower ½	< 4,150	< 3,810	< 3,980			
S96T002193	138: 7	Upper ½	< 4,160	< 4,250	< 4,205			
S96T002202		Lower ½	< 3,990	< 4,010	< 4,000			
S96T002046	138: 8	Upper ½	< 4,100	< 4,170	< 4,135			
S96T002048		Lower ½	< 3,780	< 4,080	< 3,930			
S96T002194	138: 9	Upper ½	< 3,850	< 4,100	< 3,975			
S96T002199		Lower ½	< 4,250	< 4,150	< 4,200			
S96T002090	142: 1	Upper ½	< 4,110	< 4,100	< 4,105			
S96T002310	142: 2	Upper ½	< 3,750	< 3,690	< 3,720			
S96T002316		Lower ½	< 4,080	< 4,050	< 4,065			
S96T002311	142: 3	Upper ½	< 4,040	< 4,110	< 4,075			
S96T002319		Lower ½	< 3,910	< 3,820	< 3,865			
S96T002092	142: 4	Upper ½	< 4,030	< 3,990	< 4,010			
S96T002105		Lower ½	< 3,990	< 4,120	< 4,055			
S96T002093	142: 5	Upper ½	< 3,870	< 3,740	< 3,805			
S96T002106		Lower ½	< 4,090	< 3,750	< 3,920			

Table A-31. Tank 241-S-101 Analytical Results: Thallium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 4,150	< 4,050	< 4,100	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 4,120	< 4,090	< 4,105			
S96T002095	142: 7	Upper ½	< 3,970	< 4,010	< 3,990			
S96T002107		Lower ½	< 4,290	< 4,350	< 4,320			
S96T002096	142: 8	Upper ½	< 3,980	< 3,970	< 3,975			
S96T002108		Lower ½	< 4,080	< 3,990	< 4,035			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 76.2	< 77.5	< 76.85	< 77.5	N/A	< 200
S96T001892	138: 5	Upper ½	< 76.4	< 80.5	< 78.45			
S96T001904		Lower ½	< 71.6	< 78.4	< 75			
S96T002049	138: 6	Upper ½	< 75.3	< 77.9	< 76.6			
S96T002050		Lower ½	< 74.2	< 81.8	< 78			
S96T002195	138: 7	Upper ½	< 88	< 89.8	< 88.9			
S96T002203		Lower ½	< 78.2	< 81.5	< 79.85			
S96T002051	138: 8	Upper ½	< 73.9	< 76	< 74.95			
S96T002052		Lower ½	< 75.8	< 78.2	< 77			
S96T002196	138: 9	Upper ½	< 73.8	< 72.8	< 73.3			
S96T002200		Lower ½	< 73.6	< 79.6	< 76.6			
S96T002097	142: 1	Upper ½	< 71.5	< 71.5	< 71.5			
S96T002312	142: 2	Upper ½	< 81.9	< 73.6	< 77.75			
S96T002317		Lower ½	< 74.6	< 78.1	< 76.35			

Table A-31. Tank 241-S-101 Analytical Results: Thallium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	< 81.9	< 81	< 81.45	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 83.4	< 80.3	< 81.85			
S96T002109	142: 4	Upper ½	< 80.2	< 81.8	< 81			
S96T002110		Lower ½	< 78.6	< 77.2	< 77.9			
S96T002111	142: 5	Upper ½	< 70.7	< 77.2	< 73.95			
S96T002112		Lower ½	< 71.3	< 76.4	< 73.85			
S96T002113	142: 6	Upper ½	< 77.9	< 89.5	< 83.7			
S96T002098		Lower ½	< 78.6	< 81.6	< 80.1			
S96T002114	142: 7	Upper ½	< 79.2	< 80.5	< 79.85			
S96T002115		Lower ½	< 73.4	< 71.7	< 72.55			
S96T002116	142: 8	Upper ½	< 74.1	< 72	< 73.05			
S96T002117		Lower ½	< 75.1	< 74	< 74.55			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 4,180	< 4,340	< 4,260	< 4,200	N/A	< 10,900
S96T002731	142	N/A	< 4,080	< 4,210	< 4,145			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 137	< 136	< 136.5	< 134	N/A	< 347
S96T002733	142	N/A	< 135	< 127	< 131			

Table A-31. Tank 241-S-101 Analytical Results: Thallium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 112	< 109	< 110.5	< 108	N/A	< 280
S96T002736	142	N/A	< 110	< 101	< 105.5			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 80.2	< 80.2	< 80.2	< 80.2	N/A	< 3.61
S96T001909	138: 2R1	DL	< 80.2	< 80.2	< 80.2			
S96T002043	138: 3R	DL	< 80.2	< 80.2	< 80.2			

Table A-32. Tank 241-S-101 Analytical Results: Titanium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	< 200	N/A	< 518
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	< 181	< 176	< 178.5			
S96T002045	138: 6	Upper ½	< 192	< 189	< 190.5			
S96T002047		Lower ½	< 207	< 191	< 199			
S96T002193	138: 7	Upper ½	< 208	< 212	< 210			
S96T002202		Lower ½	< 200	< 200	< 200			
S96T002046	138: 8	Upper ½	< 205	< 209	< 207			
S96T002048		Lower ½	< 189	< 204	< 196.5			
S96T002194	138: 9	Upper ½	< 193	< 205	< 199			
S96T002199		Lower ½	< 213	< 208	< 210.5			
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5			
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5			
S96T002316		Lower ½	< 204	< 203	< 203.5			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	< 204	< 187	< 195.5			

Table A-32. Tank 241-S-101 Analytical Results: Titanium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 207	< 203	< 205	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 206	< 205	< 205.5			
S96T002095	142: 7	Upper ½	< 199	< 201	< 200			
S96T002107		Lower ½	< 215	< 217	< 216			
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5			
S96T002108		Lower ½	< 204	< 200	< 202			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 3.81	< 3.87	< 3.84	5.84	14.3	15.1
S96T001892	138: 5	Upper ½	< 3.82	< 4.03	< 3.925			
S96T001904		Lower ½	< 3.58	< 3.92	< 3.75			
S96T002049	138: 6	Upper ½	3.88	< 3.89	< 3.885			
S96T002050		Lower ½	4.04	4.8	4.42			
S96T002195	138: 7	Upper ½	5.6	4.99	5.295			
S96T002203		Lower ½	6.11	6.67	6.39			
S96T002051	138: 8	Upper ½	6.81	6.62	6.715			
S96T002052		Lower ½	7.71	7.71	7.71			
S96T002196	138: 9	Upper ½	7.95	7.65	7.8			
S96T002200		Lower ½	< 3.68	< 3.98	< 3.83			
S96T002097	142: 1	Upper ½	< 3.57	< 3.57	< 3.57			
S96T002312	142: 2	Upper ½	< 4.09	< 3.68	< 3.885			
S96T002317		Lower ½	< 3.73	< 3.91	< 3.82			

Table A-32. Tank 241-S-101 Analytical Results: Titanium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	5.58	5.01	5.295	Cont.	Cont.	Cont.
S96T002320		Lower ½	< 4.17	< 4.01	< 4.09			
S96T002109	142: 4	Upper ½	5.27	5.47	5.37			
S96T002110		Lower ½	24.2	26.1	25.15			
S96T002111	142: 5	Upper ½	< 3.53	< 3.86	< 3.695			
S96T002112		Lower ½	3.76	4.38	4.07			
S96T002113	142: 6	Upper ½	< 3.89	< 4.48	< 4.185			
S96T002098		Lower ½	6.19	11.6	8.895[QC:e]			
S96T002114	142: 7	Upper ½	5.35	5.37	5.36			
S96T002115		Lower ½	6.21	5.84	6.025			
S96T002116	142: 8	Upper ½	7.28	6.98	7.13			
S96T002117		Lower ½	4.11	< 3.7	< 3.905			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 209	< 217	< 213	< 210	N/A	< 544
S96T002731	142	N/A	< 204	< 210	< 207			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 6.86	< 6.82	< 6.84	< 6.70	N/A	< 17.4
S96T002733	142	N/A	< 6.77	< 6.35	< 6.56			

Table A-32. Tank 241-S-101 Analytical Results: Titanium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54	< 5.40	N/A	< 14.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 4.01	< 4.01	< 4.01	< 4.01	N/A	< 0.180
S96T001909	138: 2R1	DL	< 4.01	< 4.01	< 4.01			
S96T002043	138: 3R	DL	< 4.01	< 4.01	< 4.01			

Table A-33. Tank 241-S-101 Analytical Results: Uranium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 9,840	< 9,310	< 9,575	< 10,100	N/A	< 26,200
S96T002040	138: 3AR	Whole	< 10,200	< 9,540	< 9,870			
S96T001891	138: 5	Upper ½	< 10,500	< 10,600	< 10,550			
S96T001902		Lower ½	< 9,070	< 8,800	< 8,935			
S96T002045	138: 6	Upper ½	< 9,590	< 9,430	< 9,510			
S96T002047		Lower ½	< 10,400	< 9,530	< 9,965			
S96T002193	138: 7	Upper ½	< 10,400	< 10,600	< 10,500			
S96T002202		Lower ½	< 9,980	< 10,000	< 9,990			
S96T002046	138: 8	Upper ½	< 10,300	< 10,400	< 10,350			
S96T002048		Lower ½	< 9,460	< 10,200	< 9,830			
S96T002194	138: 9	Upper ½	< 9,630	< 10,200	< 9,915			
S96T002199		Lower ½	< 10,600	< 10,400	< 10,500			
S96T002090	142: 1	Upper ½	< 10,300	< 10,200	< 10,250			
S96T002310	142: 2	Upper ½	< 9,380	< 9,230	< 9,305			
S96T002316		Lower ½	< 10,200	< 10,100	< 10,150			
S96T002311	142: 3	Upper ½	< 10,100	< 10,300	< 10,200			
S96T002319		Lower ½	< 9,770	< 9,540	< 9,655			
S96T002092	142: 4	Upper ½	< 10,100	< 9,990	< 10,045			
S96T002105		Lower ½	< 9,980	< 10,300	< 10,140			
S96T002093	142: 5	Upper ½	< 9,680	< 9,360	< 9,520			
S96T002106		Lower ½	< 10,200	< 9,360	< 9,780			

Table A-33. Tank 241-S-101 Analytical Results: Uranium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 10,400	< 10,100	< 10,250	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 10,300	< 10,200	< 10,250			
S96T002095	142: 7	Upper ½	10,400	< 10,000	< 10,200			
S96T002107		Lower ½	< 10,700	< 10,900	< 10,800			
S96T002096	142: 8	Upper ½	11,800	11,900	11,850			
S96T002108		Lower ½	< 10,200	11,800	< 11,000			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	2,450	2,500	2,475	4,680	23.9	12,100
S96T001892	138: 5	Upper ½	3,180	3,380	3,280			
S96T001904		Lower ½	2,030	2,220	2,125			
S96T002049	138: 6	Upper ½	3,860	4,180	4,020			
S96T002050		Lower ½	5,090	5,680	5,385			
S96T002195	138: 7	Upper ½	5,860	5,960	5,910			
S96T002203		Lower ½	6,760	7,210	6,985			
S96T002051	138: 8	Upper ½	8,050	7,920	7,985			
S96T002052		Lower ½	9,080	8,770	8,925			
S96T002196	138: 9	Upper ½	12,700	13,700	13,200			
S96T002200		Lower ½	6,200	5,960	6,080			
S96T002097	142: 1	Upper ½	501	502	501.5			
S96T002312	142: 2	Upper ½	551	488	519.5			
S96T002317		Lower ½	560	574	567			

Table A-33. Tank 241-S-101 Analytical Results: Uranium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	5,310	4,580	4,945	Cont.	Cont.	Cont.
S96T002320		Lower ½	515	525	520			
S96T002109	142: 4	Upper ½	615	611	613			
S96T002110		Lower ½	1,960	1,980	1,970			
S96T002111	142: 5	Upper ½	2,180	3,010	2,595[QC:e]			
S96T002112		Lower ½	4,220	4,200	4,210			
S96T002113	142: 6	Upper ½	486	562	524			
S96T002098		Lower ½	5,740	9,240	7,490[QC:e]			
S96T002114	142: 7	Upper ½	6,440	6,490	6,465			
S96T002115		Lower ½	8,160	8,030	8,095			
S96T002116	142: 8	Upper ½	10,100	9,840	9,970			
S96T002117		Lower ½	8,430	5,840	7,135[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 10,500	< 10,900	< 10,700	< 10,500	N/A	< 27,200
S96T002731	142	N/A	< 10,200	< 10,500	< 10,350			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	6,340	6,300	6,320	5,190	21.7	13,500
S96T002733	142	N/A	4,250	3,880	4,065			

Table A-33. Tank 241-S-101 Analytical Results: Uranium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 281	< 273	< 277	< 270	N/A	< 700
S96T002736	142	N/A	< 274	< 252	< 263			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	< 200	< 200	< 200	< 200	N/A	< 9.00
S96T001909	138: 2R1	DL	< 200	< 200	< 200			
S96T002043	138: 3R	DL	< 200	< 200	< 200			

Table A-34. Tank 241-S-101 Analytical Results: Uranium (Laser Phosphorescence).

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	8,210	7,680	7,945	6,370	24.8	16,500
S96T002731	142	N/A	4,790	4,780	4,785			

Table A-35. Tank 241-S-101 Analytical Results: Vanadium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 984	< 931	< 957.5	< 999	N/A	< 2,590
S96T002040	138: 3AR	Whole	< 1,020	< 954	< 987			
S96T001891	138: 5	Upper ½	< 1,050	< 1,060	< 1,055			
S96T001902		Lower ½	< 907	< 880	< 893.5			
S96T002045	138: 6	Upper ½	< 959	< 943	< 951			
S96T002047		Lower ½	< 1,040	< 953	< 996.5			
S96T002193	138: 7	Upper ½	< 1,040	< 1,060	< 1,050			
S96T002202		Lower ½	< 998	< 1,000	< 999			
S96T002046	138: 8	Upper ½	< 1,030	< 1,040	< 1,035			
S96T002048		Lower ½	< 946	< 1,020	< 983			
S96T002194	138: 9	Upper ½	< 963	< 1,020	< 991.5			
S96T002199		Lower ½	< 1,060	< 1,040	< 1,050			
S96T002090	142: 1	Upper ½	< 1,030	< 1,020	< 1,025			
S96T002310	142: 2	Upper ½	< 938	< 923	< 930.5			
S96T002316		Lower ½	< 1,020	< 1,010	< 1,015			
S96T002311	142: 3	Upper ½	< 1,010	< 1,030	< 1,020			
S96T002319		Lower ½	< 977	< 954	< 965.5			
S96T002092	142: 4	Upper ½	< 1,010	< 999	< 1,004.5			
S96T002105		Lower ½	< 998	< 1,030	< 1,014			

Table A-35. Tank 241-S-101 Analytical Results: Vanadium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002093	142: 5	Upper ½	< 968	< 936	< 952	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 1,020	< 936	< 978			
S96T002094	142: 6	Upper ½	< 1,040	< 1,010	< 1,025			
S96T002091		Lower ½	< 1,030	< 1,020	< 1,025			
S96T002095	142: 7	Upper ½	< 993	< 1,000	< 996.5			
S96T002107		Lower ½	< 1,070	< 1,090	< 1,080			
S96T002096	142: 8	Upper ½	< 995	< 991	< 993			
S96T002108		Lower ½	< 1,020	< 998	< 1,009			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	< 19.1	< 19.4	< 19.25	< 19.4	N/A	< 50.3
S96T001892	138: 5	Upper ½	< 19.1	< 20.1	< 19.6			
S96T001904		Lower ½	< 17.9	< 19.6	< 18.75			
S96T002049	138: 6	Upper ½	< 18.8	< 19.5	< 19.15			
S96T002050		Lower ½	< 18.5	< 20.4	< 19.45			
S96T002195	138: 7	Upper ½	< 22	< 22.5	< 22.25			
S96T002203		Lower ½	< 19.6	< 20.4	< 20			
S96T002051	138: 8	Upper ½	< 18.5	< 19	< 18.75			
S96T002052		Lower ½	< 19	< 19.6	< 19.3			
S96T002196	138: 9	Upper ½	< 18.5	< 18.2	< 18.35			
S96T002200		Lower ½	< 18.4	< 19.9	< 19.15			
S96T002097	142: 1	Upper ½	< 17.9	< 17.9	< 17.9			

Table A-35. Tank 241-S-101 Analytical Results: Vanadium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002312	142: 2	Upper ½	< 20.5	< 18.4	< 19.45	Cont.	Cont.	Cont.
S96T002317		Lower ½	< 18.7	< 19.5	< 19.1			
S96T002313	142: 3	Upper ½	< 20.5	< 20.3	< 20.4			
S96T002320		Lower ½	< 20.9	< 20.1	< 20.5			
S96T002109	142: 4	Upper ½	< 20.1	< 20.5	< 20.3			
S96T002110		Lower ½	< 19.7	< 19.3	< 19.5			
S96T002111	142: 5	Upper ½	< 17.7	< 19.3	< 18.5			
S96T002112		Lower ½	< 17.8	< 19.1	< 18.45			
S96T002113	142: 6	Upper ½	< 19.5	< 22.4	< 20.95			
S96T002098		Lower ½	< 19.6	< 20.4	< 20			
S96T002114	142: 7	Upper ½	< 19.8	< 20.1	< 19.95			
S96T002115		Lower ½	< 18.4	< 17.9	< 18.15			
S96T002116	142: 8	Upper ½	< 18.5	< 18	< 18.25			
S96T002117		Lower ½	< 18.8	< 18.5	< 18.65			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 1,050	< 1,090	< 1,070	< 1,050	N/A	< 2,720
S96T002731	142	N/A	< 1,020	< 1,050	< 1,035			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	< 34.3	< 34.1	< 34.2	< 33.5	N/A	< 86.8
S96T002733	142	N/A	< 33.8	< 31.7	< 32.75			

Table A-35. Tank 241-S-101 Analytical Results: Vanadium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	< 28.1	< 27.3	< 27.7	< 27.0	N/A	< 70.0
S96T002736	142	N/A	< 27.4	< 25.2	< 26.3			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	< 20.1	< 20.1	< 20.1	< 20.1	N/A	< 0.905
S96T001909	138: 2R1	DL	< 20.1	< 20.1	< 20.1			
S96T002043	138: 3R	DL	< 20.1	< 20.1	< 20.1			

Table A-36. Tank 241-S-101 Analytical Results: Zinc. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	< 232	N/A	< 601
S96T002040	138: 3R	Whole	219	< 191	< 205			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	< 181	< 176	< 178.5			
S96T002045	138: 6	Upper ½	< 192	< 189	< 190.5			
S96T002047		Lower ½	< 207	< 191	< 199			
S96T002193	138: 7	Upper ½	< 208	< 212	< 210			
S96T002202		Lower ½	< 200	< 200	< 200			
S96T002046	138: 8	Upper ½	< 205	< 209	< 207			
S96T002048		Lower ½	250	< 204	< 227			
S96T002194	138: 9	Upper ½	< 193	< 205	< 199			
S96T002199		Lower ½	< 213	< 208	< 210.5			
S96T002090	142: 1	Upper ½	251	953	602[QC:e]			
S96T002310	142: 2	Upper ½	218	< 185	< 201.5			
S96T002316		Lower ½	225	988	606.5[QC:e]			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	< 204	< 187	< 195.5			

Table A-36. Tank 241-S-101 Analytical Results: Zinc. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 207	< 203	< 205	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 206	< 205	< 205.5			
S96T002095	142: 7	Upper ½	< 199	< 201	< 200			
S96T002107		Lower ½	< 215	< 217	< 216			
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5			
S96T002108		Lower ½	< 204	< 200	< 202			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	29.5	29.6	29.55	27.8	7.0	72.1
S96T001892	138: 5	Upper ½	18.2	19.2	18.7			
S96T001904		Lower ½	25.9	29.3	27.6			
S96T002049	138: 6	Upper ½	15.7	19.4	17.55[QC:e]			
S96T002050		Lower ½	17	24.9	20.95[QC:e]			
S96T002195	138: 7	Upper ½	45.6	29.4	37.5[QC:e]			
S96T002203		Lower ½	28.1	30.1	29.1			
S96T002051	138: 8	Upper ½	19.7	22.9	21.3			
S96T002052		Lower ½	25.8	26.3	26.05			
S96T002196	138: 9	Upper ½	41.1	35.7	38.4			
S96T002200		Lower ½	26.6	27.2	26.9			
S96T002097	142: 1	Upper ½	30	32.1	31.05			
S96T002312	142: 2	Upper ½	39.6	31.4	35.5[QC:e]			
S96T002317		Lower ½	34.1	39.4	36.75			

Table A-36. Tank 241-S-101 Analytical Results: Zinc. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	18.2	16.3	17.25	Cont.	Cont.	Cont.
S96T002320		Lower ½	38.4	31.7	35.05			
S96T002109	142: 4	Upper ½	34.9	38.6	36.75			
S96T002110		Lower ½	28	27.9	27.95			
S96T002111	142: 5	Upper ½	19.3	19.9	19.6			
S96T002112		Lower ½	16.1	17.3	16.7			
S96T002113	142: 6	Upper ½	49.9	35.2	42.55[QC:e]			
S96T002098		Lower ½	25.5	53.9	39.7[QC:e]			
S96T002114	142: 7	Upper ½	15.2	14.4	14.8			
S96T002115		Lower ½	22.4	21.3	21.85			
S96T002116	142: 8	Upper ½	22.6	22	22.3			
S96T002117		Lower ½	33.5	23.9	28.7[QC:e]			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	21.8	18.2	20	18.6	7.4	48.2
S96T002733	142	N/A	18.8	15.7	17.25			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/	< 209	< 217	< 213	< 210	N/A	< 544
S96T002731	142	N/A	< 204	< 210	< 207			

Table A-36. Tank 241-S-101 Analytical Results: Zinc. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002726	138	N/A	9.29	8.01	8.65	6.96	24.4	18.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	19.4	19.3	19.35	28.6	27.5	1.29
S96T001909	138: 2R1	DL	43.9	44.4	44.15			
S96T002043	138: 3R	DL	22.5	21.8	22.15			

Table A-37. Tank 241-S-101 Analytical Results: Zirconium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5	< 200	N/A	< 518
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5			
S96T001891	138: 5	Upper ½	< 210	< 212	< 211			
S96T001902		Lower ½	< 181	< 176	< 178.5			
S96T002045	138: 6	Upper ½	< 192	< 189	< 190.5			
S96T002047		Lower ½	< 207	< 191	< 199			
S96T002193	138: 7	Upper ½	< 208	< 212	< 210			
S96T002202		Lower ½	< 200	< 200	< 200			
S96T002046	138: 8	Upper ½	< 205	< 209	< 207			
S96T002048		Lower ½	< 189	< 204	< 196.5			
S96T002194	138: 9	Upper ½	< 193	< 205	< 199			
S96T002199		Lower ½	< 213	< 208	< 210.5			
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5			
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5			
S96T002316		Lower ½	< 204	< 203	< 203.5			
S96T002311	142: 3	Upper ½	< 202	< 206	< 204			
S96T002319		Lower ½	< 195	< 191	< 193			
S96T002092	142: 4	Upper ½	< 202	< 200	< 201			
S96T002105		Lower ½	< 200	< 206	< 203			
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5			
S96T002106		Lower ½	< 204	< 187	< 195.5			

Table A-37. Tank 241-S-101 Analytical Results: Zirconium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002094	142: 6	Upper ½	< 207	< 203	< 205	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 206	< 205	< 205.5			
S96T002095	142: 7	Upper ½	< 199	< 201	< 200			
S96T002107		Lower ½	< 215	< 217	< 216			
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5			
S96T002108		Lower ½	< 204	< 200	< 202			
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001905	138: 2R1	Lower ½	15.3	15.7	15.5	22.7	16.5	58.8
S96T001892	138: 5	Upper ½	16	17.3	16.65			
S96T001904		Lower ½	11.9	12.9	12.4			
S96T002049	138: 6	Upper ½	18.1	19.9	19			
S96T002050		Lower ½	23.8	26.8	25.3			
S96T002195	138: 7	Upper ½	27.2	27.6	27.4			
S96T002203		Lower ½	30.7	34.4	32.55			
S96T002051	138: 8	Upper ½	35.3	35.2	35.25			
S96T002052		Lower ½	40.2	39.3	39.75			
S96T002196	138: 9	Upper ½	54.1	56.4	55.25			
S96T002200		Lower ½	19.5	20.1	19.8			
S96T002097	142: 1	Upper ½	9.98	10.1	10.04			
S96T002312	142: 2	Upper ½	11	9.9	10.45			
S96T002317		Lower ½	10.5	11.3	10.9			

Table A-37. Tank 241-S-101 Analytical Results: Zirconium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002313	142: 3	Upper ½	23.5	20	21.75	Cont.	Cont.	Cont.
S96T002320		Lower ½	8.93	9.57	9.25			
S96T002109	142: 4	Upper ½	11.4	11	11.2			
S96T002110		Lower ½	12.5	13.3	12.9			
S96T002111	142: 5	Upper ½	8.77	12.5	10.635[QC:e]			
S96T002112		Lower ½	17.2	17.9	17.55			
S96T002113	142: 6	Upper ½	8.49	9.48	8.985			
S96T002098		Lower ½	23	38.3	30.65[QC:e]			
S96T002114	142: 7	Upper ½	25	25.4	25.2			
S96T002115		Lower ½	36.5	35.8	36.15			
S96T002116	142: 8	Upper ½	44.6	43.6	44.1			
S96T002117		Lower ½	36.8	28	32.4[QC:e]			
Solid composites: fusion digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002723	138	N/A	< 209	< 217	< 213	< 210	N/A	< 544
S96T002731	142	N/A	< 204	< 210	< 207			
Solid composites: acid digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002724	138	N/A	29.6	29.1	29.35	25.6	14.8	66.4
S96T002733	142	N/A	21.3	22.3	21.8			

Table A-37. Tank 241-S-101 Analytical Results: Zirconium. (4 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: H_2O/acid dilution			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54	< 5.40	N/A	< 14.0
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 4.01	< 4.01	< 4.01	< 4.01	N/A	< 0.180
S96T001909	138: 2R1	DL	< 4.01	< 4.01	< 4.01			
S96T002043	138: 3R	DL	< 4.01	< 4.01	< 4.01			

Table A-40. Tank 241-S-101 Analytical Results: Chloride. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	4,718	4,630	4,674	3,460	9.5	8,970
S96T001893	138: 5	Upper ½	4,063	4,160	4,111.5			
S96T001906		Lower ½	3,838	3,840	3,839			
S96T003326	138: 6	Upper ½	5,284	3,700	4,492[QC:e]			
S96T003327		Lower ½	3,529	3,150	3,339.5			
S96T003497	138: 7	Upper ½	3,058	3,190	3,124			
S96T003498		Lower ½	3,381	1,430	2,405.5[QC:e]			
S96T003463	138: 8	Upper ½	1,465	872	1,168.5[QC:e]			
S96T003464		Lower ½	1,630	1,930	1,780			
S96T003461	138: 9	Upper ½	2,482	1,550	2,016[QC:e]			
S96T003462		Lower ½	1,970	1,960	1,965			
S96T002099	142: 1	Upper ½	4,729	4,790	4,759.5			
S96T002314	142: 2	Upper ½	4,501	4,580	4,540.5			
S96T002318		Lower ½	4,410	4,250	4,330			
S96T002315	142: 3	Upper ½	4,534	4,570	4,552			
S96T003499		Lower ½	4,794	4,950	4,872			
S96T002118	142: 4	Upper ½	4,209	4,300	4,254.5			
S96T002119		Lower ½	4,344	4,190	4,267			
S96T002120	142: 5	Upper ½	4,033	3,990	4,011.5			
S96T002121		Lower ½	3,771	3,650	3,710.5			

Table A-40. Tank 241-S-101 Analytical Results: Chloride. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002122	142: 6	Upper ½	3,590	3,660	3,625	Cont.	Cont.	Cont.
S96T002100		Lower ½	3,515	3,410	3,462.5			
S96T002123	142: 7	Upper ½	2,991	3,120	3,055.5			
S96T002124		Lower ½	2,372	2,680	2,526			
S96T002125	142: 8	Upper ½	1,137	1,500	1,318.5[QC:e]			
S96T002126		Lower ½	2,496	2,650	2,573			
Solid composites: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002725	138	N/A	3,134	2,900	3,017	3,260	7.5	8,450
S96T002735	142	N/A	3,267	3,740	3,503.5			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	7,370	7,200	7,285	7,450	1.3	335
S96T001909	138: 2R1	DL	7,475	7,420	7,447.5			
S96T002043	138: 3R	DL	7,658	7,570	7,614			

Table A-41. Tank 241-S-101 Analytical Results: Fluoride. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	< 112.2	< 107	< 109.6	< 233	N/A	< 596
S96T001893	138: 5	Upper ½	< 91.02	260	175.51[QC:e]			
S96T001906		Lower ½	< 98.8	< 91	< 94.9			
S96T003326	138: 6	Upper ½	102	98.7	100.35			
S96T003327		Lower ½	95.93	88	91.965			
S96T003497	138: 7	Upper ½	< 54.23	91.7	72.965[QC:e]			
S96T003498		Lower ½	53.69	< 36.3	44.995[QC:e]			
S96T003463	138: 8	Upper ½	< 31.92	< 31.9	< 31.91			
S96T003464		Lower ½	< 37.96	< 38.1	< 38.03			
S96T003461	138: 9	Upper ½	< 37.23	< 36.1	< 36.665			
S96T003462		Lower ½	< 35.76	< 34.4	< 35.08			
S96T002099	142: 1	Upper ½	494.8	498	496.4			
S96T002314	142: 2	Upper ½	650.5	626	638.25			
S96T002318		Lower ½	1,740	1,560	1,650			
S96T002315	142: 3	Upper ½	609.4	605	607.2			
S96T003499		Lower ½	354.4	330	342.2			
S96T002118	142: 4	Upper ½	590.1	500	545.05			
S96T002119		Lower ½	< 51.94	< 51.6	< 51.77			

Table A-41. Tank 241-S-101 Analytical Results: Fluoride. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002120	142: 5	Upper ½	< 50.18	< 52.8	< 51.49			
S96T002121		Lower ½	< 51.19	< 49.7	< 50.445	Cont.	Cont.	Cont.
S96T002122	142: 6	Upper ½	< 54.47	< 55.5	< 54.985			
S96T002100		Lower ½	< 53.67	< 54.1	< 53.885			
S96T002123	142: 7	Upper ½	< 55.78	< 50.3	< 53.04			
S96T002124		Lower ½	< 48.59	< 50.2	< 49.395			
S96T002125	142: 8	Upper ½	< 27.4	< 26.5	< 26.95			
S96T002126		Lower ½	361	< 56.4	208.7[QC:e]			
Solid composites: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002725	138	N/A	< 59.79	138	98.895[QC:e]	334	70.4	866
S96T002735	142	N/A	138.3	999	568.65[QC:e]			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	< 132.6	< 133	< 132.8	< 106	N/A	< 4.77
S96T001909	138: 2R1	DL	< 132.6	< 133	< 132.8			
S96T002043	138: 3R	DL	< 53.83	< 53.8	< 53.815			

Table A-42. Tank 241-S-101 Analytical Results: Nitrate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	3.327E+05	3.240E+05	3.284E+05	1.62E+05	25.1	4.20E+05
S96T001893	138: 5	Upper ½	3.105E+05	3.490E+05	3.298E+05			
S96T001906		Lower ½	4.970E+05	3.280E+05	4.125E+05[QC:e]			
S96T003326	138: 6	Upper ½	1.702E+05	1.610E+05	1.656E+05			
S96T003327		Lower ½	1.584E+05	1.550E+05	1.567E+05			
S96T003497	138: 7	Upper ½	1.613E+05	1.710E+05	1.662E+05			
S96T003498		Lower ½	1.264E+05	78,300	1.024E+05[QC:e]			
S96T003463	138: 8	Upper ½	83,530	44,700	64,115[QC:e]			
S96T003464		Lower ½	1.089E+05	1.180E+05	1.135E+05			
S96T003461	138: 9	Upper ½	1.389E+05	1.030E+05	1.210E+05[QC:e]			
S96T003462		Lower ½	1.559E+05	1.370E+05	1.465E+05			
S96T002099	142: 1	Upper ½	1.118E+05	1.160E+05	1.139E+05			
S96T002314	142: 2	Upper ½	1.092E+05	1.100E+05	1.096E+05			
S96T002318		Lower ½	1.028E+05	1.010E+05	1.019E+05			
S96T002315	142: 3	Upper ½	1.073E+05	1.100E+05	1.087E+05			
S96T003499		Lower ½	1.050E+05	1.110E+05	1.080E+05			
S96T002118	142: 4	Upper ½	1.131E+05	1.140E+05	1.136E+05			
S96T002119		Lower ½	1.152E+05	1.220E+05	1.186E+05			
S96T002120	142: 5	Upper ½	1.340E+05	1.250E+05	1.295E+05			
S96T002121		Lower ½	1.278E+05	1.310E+05	1.294E+05			

Table A-42. Tank 241-S-101 Analytical Results: Nitrate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002122	142: 6	Upper ½	1.328E+05	1.380E+05	1.354E+05	Cont.	Cont.	Cont.
S96T002100		Lower ½	1.461E+05	1.470E+05	1.466E+05			
S96T002123	142: 7	Upper ½	1.515E+05	1.450E+05	1.483E+05			
S96T002124		Lower ½	1.272E+05	1.430E+05	1.351E+05			
S96T002125	142: 8	Upper ½	71,670	83,900	77,785			
S96T002126		Lower ½	1.482E+05	1.460E+05	1.471E+05			
Solid composites: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002725	138	N/A	1.488E+05	1.460E+05	1.474E+05	1.35E+05	9.5	3.50E+05
S96T002735	142	N/A	1.135E+05	1.300E+05	1.218E+05			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	1.786E+05	1.730E+05	1.758E+05	1.81E+05	1.7	8,150
S96T001909	138: 2R1	DL	1.818E+05	1.830E+05	1.824E+05			
S96T002043	138: 3R	DL	1.872E+05	1.850E+05	1.861E+05			

Table A-43. Tank 241-S-101 Analytical Results: Nitrite. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	57,410	56,700	57,055	49,200	8.4	1.28E+05
S96T001893	138: 5	Upper ½	56,320	38,800	47,560[QC:e]			
S96T001906		Lower ½	1,006	50,800	25,903[QC:e]			
S96T002099	142: 1	Upper ½	58,590	59,900	59,245			
S96T002314	142: 2	Upper ½	58,350	58,300	58,325			
S96T002318		Lower ½	60,060	59,600	59,830			
S96T002315	142: 3	Upper ½	60,310	60,500	60,405			
S96T002118	142: 4	Upper ½	58,390	60,100	59,245			
S96T002119		Lower ½	64,250	65,100	64,675			
S96T002120	142: 5	Upper ½	60,910	60,300	60,605			
S96T002121		Lower ½	56,310	55,000	55,655			
S96T002122	142: 6	Upper ½	53,200	53,400	53,300			
S96T002100		Lower ½	48,990	48,100	48,545			
S96T002123	142: 7	Upper ½	41,420	43,400	42,410			
S96T002124		Lower ½	30,640	34,900	32,770			
S96T002125	142: 8	Upper ½	14,620	19,300	16,960[QC:e]			
S96T002126		Lower ½	31,910	32,700	32,305			
Solid composites: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002725	138	N/A	43,810	40,300	42,055	45,000	6.5	1.17E+05
S96T002735	142	N/A	44,310	51,500	47,905			

Table A-43. Tank 241-S-101 Analytical Results: Nitrite. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	93,360	91,500	92,430	94,000	1.0	4,230
S96T001909	138: 2R1	DL	93,480	94,700	94,090			
S96T002043	138: 3R	DL	95,650	95,600	95,625			

Table A-44. Tank 241-S-101 Analytical Results: Phosphate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	< 1,027	< 976	< 1,001.5	3,680	56.3	9,540
S96T001893	138: 5	Upper ½	< 832.5	< 894	< 863.25			
S96T001906		Lower ½	3,502	< 832	< 2,167[QC:e]			
S96T003326	138: 6	Upper ½	4,755	5,400	5,077.5			
S96T003327		Lower ½	3,656	3,630	3,643			
S96T003497	138: 7	Upper ½	2,672	2,660	2,666			
S96T003498		Lower ½	1,299	914	1,106.5[QC:e]			
S96T003463	138: 8	Upper ½	446	< 292	< 369[QC:e]			
S96T003464		Lower ½	< 347.2	< 348	< 347.6			
S96T003461	138: 9	Upper ½	< 340.5	< 330	< 335.25			
S96T003462		Lower ½	< 327.1	< 315	< 321.05			
S96T002099	142: 1	Upper ½	6,819	7,530	7,174.5			
S96T002314	142: 2	Upper ½	9,390	9,070	9,230			
S96T002318		Lower ½	12,010	10,400	11,205			
S96T002315	142: 3	Upper ½	10,520	10,600	10,560			
S96T003499		Lower ½	8,070	8,010	8,040			
S96T002118	142: 4	Upper ½	10,670	9,410	10,040			
S96T002119		Lower ½	5,896	6,780	6,338			
S96T002120	142: 5	Upper ½	5,603	5,210	5,406.5			
S96T002121		Lower ½	5,557	5,310	5,433.5			

Table A-44. Tank 241-S-101 Analytical Results: Phosphate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002122	142: 6	Upper ½	4,591	4,420	4,505.5	Cont.	Cont.	Cont.
S96T002100		Lower ½	3,797	3,960	3,878.5			
S96T002123	142: 7	Upper ½	1,490	1,710	1,600			
S96T002124		Lower ½	1,085	1,190	1,137.5			
S96T002125	142: 8	Upper ½	< 250.6	311	280.8[QC:e]			
S96T002126		Lower ½	< 507.3	< 515	< 511.15			
Solid composites: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002725	138	N/A	2,641	2,190	2,415.5	4,020	39.9	10,400
S96T002735	142	N/A	5,747	5,500	5,623.5			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	3,531	3,560	3,545.5	3,600	6.1	162
S96T001909	138: 2R1	DL	3,013	3,500	3,256.5			
S96T002043	138: 3R	DL	4,131	3,890	4,010.5			

Table A-45. Tank 241-S-101 Analytical Results: Sulfate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	17,370	17,500	17,435	7,250	46.1	18,800
S96T001893	138: 5	Upper ½	2,247	4,150	3,198.5[QC:e]			
S96T001906		Lower ½	1,247	1,040	1,143.5			
S96T003326	138: 6	Upper ½	1,346	1,140	1,243			
S96T003327		Lower ½	1,005	989	997			
S96T003497	138: 7	Upper ½	974	1,170	1,072			
S96T003498		Lower ½	1,136	652	894[QC:e]			
S96T003463	138: 8	Upper ½	509.6	< 334	421.8[QC:e]			
S96T003464		Lower ½	658.9	870	764.45[QC:e]			
S96T003461	138: 9	Upper ½	995.2	633	814.1[QC:e]			
S96T003462		Lower ½	758.7	829	793.85			
S96T002099	142: 1	Upper ½	20,440	20,300	20,370			
S96T002314	142: 2	Upper ½	24,540	25,400	24,970			
S96T002318		Lower ½	23,810	24,400	24,105			
S96T002315	142: 3	Upper ½	22,990	23,000	22,995			
S96T003499		Lower ½	20,680	20,200	20,440			
S96T002118	142: 4	Upper ½	20,910	20,800	20,855			
S96T002119		Lower ½	6,799	7,230	7,014.5			
S96T002120	142: 5	Upper ½	2,199	1,050	1,624.5[QC:e]			
S96T002121		Lower ½	1,187	916	1,051.5[QC:e]			

Table A-45. Tank 241-S-101 Analytical Results: Sulfate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002122	142: 6	Upper ½	742.4	1,020	881.2[QC:e]	Cont.	Cont.	Cont.
S96T002100		Lower ½	1,362	1,330	1,346			
S96T002123	142: 7	Upper ½	1,292	1,420	1,356			
S96T002124		Lower ½	1,211	1,190	1,200.5			
S96T002125	142: 8	Upper ½	554.1	706	630.05[QC:e]			
S96T002126		Lower ½	989.6	1,400	1,194.8[QC:e]			
Solid composites: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002725	138	N/A	3,975	2,940	3,457.5[QC:e]	6,270	44.9	16,300
S96T002735	142	N/A	8,732	9,430	9,081			
Drainable liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001886	138: 1R	DL	5,078	5,270	5,174	5,650	4.6	254
S96T001909	138: 2R1	DL	5,130	6,290	5,710			
S96T002043	138: 3R	DL	6,051	6,090	6,070.5			

Table A-46. Tank 241-S-101 Analytical Results: Oxalate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001907	138: 2R1	Lower ½	10,660	13,000	11,830	5,700	44.7	14,800
S96T001893	138: 5	Upper ½	1,396	5,640	3,518[QC:e]			
S96T001906		Lower ½	4,556	1,080	2,818[QC:e]			
S96T003326	138: 6	Upper ½	4,124	3,800	3,962			
S96T003327		Lower ½	1,550	1,370	1,460			
S96T003497	138: 7	Upper ½	< 438	< 438	< 438			
S96T003498		Lower ½	< 295.9	< 293	< 294.45			
S96T003463	138: 8	Upper ½	< 257.8	< 258	< 257.9			
S96T003464		Lower ½	< 306.6	< 308	< 307.3			
S96T003461	138: 9	Upper ½	< 300.7	< 292	< 296.35			
S96T003462		Lower ½	< 288.9	< 278	< 283.45			
S96T002099	142: 1	Upper ½	13,380	13,300	13,340			
S96T002314	142: 2	Upper ½	13,370	14,200	13,785			
S96T002318		Lower ½	13,890	13,200	13,545			
S96T002315	142: 3	Upper ½	14,740	14,600	14,670			
S96T003499		Lower ½	15,740	15,100	15,420			
S96T002118	142: 4	Upper ½	16,300	16,100	16,200			
S96T002119		Lower ½	11,080	10,600	10,840			
S96T002120	142: 5	Upper ½	7,504	7,580	7,542			
S96T002121		Lower ½	7,267	9,960	8,613.5[QC:e]			

Table A-46. Tank 241-S-101 Analytical Results: Oxalate. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002122	142: 6	Upper ½	1,858	1,640	1,749	Cont.	Cont.	Cont.
S96T002100		Lower ½	1,007	898	952.5			
S96T002123	142: 7	Upper ½	519.2	502	510.6			
S96T002124		Lower ½	< 392.5	< 405	< 398.75			
S96T002125	142: 8	Upper ½	< 221.3	< 214	< 217.65			
S96T002126		Lower ½	< 448	2,300	1,374[QC:e]			
Solid composites: water digest			**µg/g**	**µg/g**	**µg/g**	**µg/g**	**%**	**kg**
S96T002725	138	N/A	1,386	1,320	1,353	3,940	65.7	10,200
S96T002735	142	N/A	6,325	6,740	6,532.5			
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**	**µg/mL**	**%**	**kg**
S96T001886	138: 1R	DL	< 1,071	< 1,070	< 1,070.5	< 858	N/A	< 38.6
S96T001909	138: 2R1	DL	< 1,071	< 1,070	< 1,070.5			
S96T002043	138: 3R	DL	< 434.8	< 435	< 434.9			

Table A-47. Tank 241-S-101 Analytical Results: Total Alpha.

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T001903	138: 2R1	Lower ½	0.914	1.21	1.062[QC:e]	0.358	24.0	928
S96T002040	138: 3AR	hole	0.285	0.304	0.2945			
S96T001902	138: 5	Lower ½	0.268	0.254	0.261			
S96T002047	138: 6	Lower ½	0.275	0.275	0.275			
S96T002202	138: 7	Lower ½	0.439	0.386	0.4125			
S96T002048	138: 8	Lower ½	0.492	0.527	0.5095			
S96T002199	138: 9	Lower ½	0.126	0.266	0.196[QC:e]			
S96T002090	142: 1	Upper ½	0.149	0.131	0.14			
S96T002316	142: 2	Lower ½	0.137	0.123	0.13			
S96T002319	142: 3	Lower ½	0.126	0.107	0.1165			
S96T002105	142: 4	Lower ½	0.231	0.217	0.224			
S96T002106	142: 5	Lower ½	0.377	0.298	0.3375[QC:e]			
S96T002091	142: 6	Lower ½	0.318	0.368	0.343			
S96T002107	142: 7	Lower ½	0.388	0.513	0.4505[QC:e]			
S96T002108	142: 8	Lower ½	0.496	0.58	0.538			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	0.335	0.391	0.363	0.321	13.3	832
S96T002731	142	N/A	0.281	0.275	0.278			
Drainable liquids			**µCi/mL**	**µCi/mL**	**µCi/mL**	**µCi/mL**	**%**	**Ci**
S96T001886	138: 1R	DL	0.0109	0.0124	0.01165	<0.00810	N/A	< 21.0
S96T001909	138: 2R1	DL	< 0.00693	< 0.0143	< 0.010615			
S96T002043	138: 3R	DL	< 0.00166	< 0.0024	< 0.00203			

Table A-48. Tank 241-S-101 Analytical Results: Total Beta.

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002723	138	N/A	693	685	689	603	14.4	1.56e+06
S96T002731	142	N/A	515	517	516			

Table A-49. Tank 241-S-101 Analytical Results: Americium-241. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001903	138: 2R1	Lower ½	< 1.568	< 1.63	< 1.599	< 4.43	N/A	< 11,500
S96T002040	138: 3AR	hole	< 1.658	< 1.62	< 1.639			
S96T001891	138: 5	Upper ½	< 1.883	< 1.87	< 1.8765			
S96T001902		Lower ½	< 2.346	< 2.36	< 2.353			
S96T002045	138: 6	Upper ½	< 2.537	< 2.49	< 2.5135			
S96T002047		Lower ½	< 0.1112	< 0.125	< 0.1181			
S96T002193	138: 7	Upper ½	< 2.437	< 2.35	< 2.3935			
S96T002202		Lower ½	< 2.329	< 2.33	< 2.3295			
S96T002046	138: 8	Upper ½	< 5.724	< 5.89	< 5.807			
S96T002048		Lower ½	< 0.9196	< 0.975	< 0.9473			
S96T002194	138: 9	Upper ½	< 5.572	< 6.12	< 5.846			
S96T002199		Lower ½	< 2.187	< 2.04	< 2.1135			
S96T002090	142: 1	Upper ½	< 0.859	< 0.844	< 0.8515			
S96T002310	142: 2	Upper ½	< 0.8259	< 0.807	< 0.81645			
S96T002316		Lower ½	< 0.8283	< 0.834	< 0.83115			
S96T002311	142: 3	Upper ½	< 0.1141	< 0.121	< 0.11755			
S96T002319		Lower ½	< 0.1003	< 0.126	< 0.11315			
S96T002092	142: 4	Upper ½	< 0.1087	< 126	< 63.0543			
S96T002105		Lower ½	< 4.195	< 4.24	< 4.2175			

Table A-49. Tank 241-S-101 Analytical Results: Americium-241. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002093	142: 5	Upper ½	< 3.736	< 4.09	< 3.913	Cont.	Cont.	Cont.
S96T002106		Lower ½	< 4.185	< 3.58	< 3.8825			
S96T002094	142: 6	Upper ½	< 3.882	< 4.11	< 3.996			
S96T002091		Lower ½	< 3.489	< 3.79	< 3.6395			
S96T002095	142: 7	Upper ½	< 3.74	< 3.62	< 3.68			
S96T002107		Lower ½	< 5.07	< 6.07	< 5.57			
S96T002096	142: 8	Upper ½	< 5.84	< 5.77	< 5.805			
S96T002108		Lower ½	< 5.422	< 5.52	< 5.471			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	< 1.097	< 1.12	< 1.1085	< 1.13	N/A	< 2,930
S96T002731	142	N/A	< 1.133	< 1.17	< 1.1515			

Table A-50. Tank 241-S-101 Analytical Results: Cesium-137. . (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001903	138: 2R1	Lower ½	157.4	178	167.7	131	10.3	3.40E+05
S96T002040	138: 3AR	hole	117.7	118	117.85			
S96T001891	138: 5	Upper ½	155.8	160	157.9			
S96T001902		Lower ½	138.9	141	139.95			
S96T002045	138: 6	Upper ½	129.5	132	130.75			
S96T002047		Lower ½	98.14	113	105.57			
S96T002193	138: 7	Upper ½	110.7	111	110.85			
S96T002202		Lower ½	96.87	98.2	97.535			
S96T002046	138: 8	Upper ½	89.11	90.1	89.605			
S96T002048		Lower ½	80.72	83.6	82.16			
S96T002194	138: 9	Upper ½	77.54	78.9	78.22			
S96T002199		Lower ½	71.61	70.9	71.255			
S96T002090	142: 1	Upper ½	176.5	176	176.25			
S96T002310	142: 2	Upper ½	175.7	173	174.35			
S96T002316		Lower ½	171	167	169			
S96T002311	142: 3	Upper ½	179.6	183	181.3			
S96T002319		Lower ½	188.7	191	189.85			
S96T002092	142: 4	Upper ½	174	173	173.5			
S96T002105		Lower ½	172.3	167	169.65			
S96T002093	142: 5	Upper ½	145.4	149	147.2			
S96T002106		Lower ½	139.6	123	131.3			

Table A-50. Tank 241-S-101 Analytical Results: Cesium-137. . (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002094	142: 6	Upper ½	132	133	132.5	Cont.	Cont.	Cont.
S96T002091		Lower ½	103.6	118	110.8			
S96T002095	142: 7	Upper ½	103.7	107	105.35			
S96T002107		Lower ½	61.74	116	88.87[QC:e]			
S96T002096	142: 8	Upper ½	97.52	75.4	86.46[QC:e]			
S96T002108		Lower ½	90.6	76.9	83.75			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	115.3	120	117.65	134	12.2	3.47E+05
S96T002731	142	N/A	148.8	152	150.4			

Table A-51. Tank 241-S-101 Analytical Results: Cobalt-60. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001903	138: 2R1	Lower ½	< 0.05332	< 0.0553	< 0.05431	< 0.190	N/A	< 493
S96T002040	138: 3AR	hole	< 0.0833	< 0.0999	< 0.0916			
S96T001891	138: 5	Upper ½	< 0.05518	< 0.0829	< 0.06904[QC:e]			
S96T001902		Lower ½	< 0.1308	< 0.113	< 0.1219			
S96T002045	138: 6	Upper ½	< 0.1423	< 0.14	< 0.14115			
S96T002047		Lower ½	< 0.02026	< 0.0248	< 0.02253			
S96T002193	138: 7	Upper ½	< 0.1261	< 0.0943	< 0.1102[QC:e]			
S96T002202		Lower ½	< 0.1175	< 0.0889	< 0.1032[QC:e]			
S96T002046	138: 8	Upper ½	< 0.5841	< 0.619	< 0.60155			
S96T002048		Lower ½	< 0.06895	< 0.0838	< 0.076375			
S96T002194	138: 9	Upper ½	< 0.5434	< 0.72	< 0.6317[QC:e]			
S96T002199		Lower ½	< 0.1554	< 0.15	< 0.1527			
S96T002090	142: 1	Upper ½	< 0.02719	< 0.0277	< 0.027445			
S96T002310	142: 2	Upper ½	0.02809	< 0.023	< 0.025545			
S96T002316		Lower ½	< 0.02932	0.0284	< 0.02886			
S96T002311	142: 3	Upper ½	< 0.02812	< 0.0321	< 0.03011			
S96T002319		Lower ½	< 0.0275	< 0.0284	< 0.02795			

Table A-51. Tank 241-S-101 Analytical Results: Cobalt-60. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002092	142: 4	Upper ½	0.03844	< 0.033	< 0.03572	Cont.	Cont.	Cont.
S96T002105		Lower ½	< 0.3729	< 0.31	< 0.34145			
S96T002093	142: 5	Upper ½	< 0.3617	< 0.327	< 0.34435			
S96T002106		Lower ½	< 0.3196	< 0.275	< 0.2973			
S96T002094	142: 6	Upper ½	< 0.2526	< 0.25	< 0.2513			
S96T002091		Lower ½	< 0.2361	< 0.256	< 0.24605			
S96T002095	142: 7	Upper ½	< 0.2892	< 0.26	< 0.2746			
S96T002107		Lower ½	< 0.4906	< 0.555	< 0.5228			
S96T002096	142: 8	Upper ½	< 0.5535	< 0.592	< 0.57275			
S96T002108		Lower ½	< 0.5884	< 0.656	< 0.6222			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	< 0.03353	< 0.0321	< 0.032815	< 0.0323	N/A	< 83.7
S96T002731	142	N/A	< 0.03168	< 0.0319	< 0.03179			

Table A-51. Tank 241-S-101 Analytical Results: Europium-154. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001903	138: 2R1	Lower ½	< 0.2271	< 0.175	< 0.20105	< 0.557	N/A	< 1,440
S96T002040	138: 3AR	hole	< 0.3608	< 0.313	< 0.3369			
S96T001891	138: 5	Upper ½	< 0.2506	< 0.245	< 0.2478			
S96T001902		Lower ½	< 0.3251	< 0.356	< 0.34055			
S96T002045	138: 6	Upper ½	< 0.375	< 0.514	< 0.4445			
S96T002047		Lower ½	< 0.1046	< 0.0904	< 0.0975			
S96T002193	138: 7	Upper ½	< 0.5574	< 0.407	< 0.4822			
S96T002202		Lower ½	< 0.4276	< 0.401	< 0.4143			
S96T002046	138: 8	Upper ½	< 1.661	< 1.6	< 1.6305			
S96T002048		Lower ½	< 0.2494	< 0.263	< 0.2562			
S96T002194	138: 9	Upper ½	< 1.326	< 1.34	< 1.333			
S96T002199		Lower ½	< 0.3988	< 0.359	< 0.3789			
S96T002090	142: 1	Upper ½	< 0.1038	< 0.0964	< 0.1001			
S96T002310	142: 2	Upper ½	< 0.107	< 0.11	< 0.1085			
S96T002316		Lower ½	< 0.115	< 0.111	< 0.113			
S96T002311	142: 3	Upper ½	< 0.1122	< 0.116	< 0.1141			
S96T002319		Lower ½	< 0.1047	< 0.113	< 0.10885			

Table A-51. Tank 241-S-101 Analytical Results: Europium-154. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002092	142: 4	Upper ½	< 0.1121	< 0.124	< 0.11805	Cont.	Cont.	Cont.
S96T002105		Lower ½	< 0.7253	< 1.12	< 0.92265			
S96T002093	142: 5	Upper ½	< 1.159	< 0.781	< 0.97			
S96T002106		Lower ½	< 1.04	< 0.816	< 0.928			
S96T002094	142: 6	Upper ½	< 0.7656	< 0.814	< 0.7898			
S96T002091		Lower ½	< 0.6298	< 0.812	< 0.7209			
S96T002095	142: 7	Upper ½	< 0.7641	< 0.815	< 0.78955			
S96T002107		Lower ½	< 1.98	< 1.65	< 1.815			
S96T002096	142: 8	Upper ½	< 2.021	< 1.43	< 1.7255			
S96T002108		Lower ½	< 1.747	< 1.07	< 1.4085			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	< 0.1268	< 0.158	< 0.1424	< 0.146	N/A	< 378
S96T002731	142	N/A	< 0.1433	< 0.154	< 0.14865			

Table A-52. Tank 241-S-101 Analytical Results: Europium-155. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001903	138: 2R1	Lower ½	< 0.6049	< 0.619	< 0.61195	< 1.06	N/A	< 2,750
S96T002040	138: 3AR	hole	< 0.8007	< 0.752	< 0.77635			
S96T001891	138: 5	Upper ½	< 0.7104	< 0.734	< 0.7222			
S96T001902		Lower ½	< 0.9313	< 0.924	< 0.92765			
S96T002045	138: 6	Upper ½	< 1.206	< 1.24	< 1.223			
S96T002047		Lower ½	< 0.1975	< 0.2	< 0.19875			
S96T002193	138: 7	Upper ½	< 0.9476	< 0.998	< 0.9728			
S96T002202		Lower ½	< 0.9537	< 0.926	< 0.93985			
S96T002046	138: 8	Upper ½	< 2.344	< 2.29	< 2.317			
S96T002048		Lower ½	< 0.4267	< 0.465	< 0.44585			
S96T002194	138: 9	Upper ½	< 2.187	< 2.25	< 2.2185			
S96T002199		Lower ½	< 0.8212	< 0.854	< 0.8376			
S96T002090	142: 1	Upper ½	< 0.4158	< 0.418	< 0.4169			
S96T002310	142: 2	Upper ½	< 0.3959	< 0.388	< 0.39195			
S96T002316		Lower ½	< 0.4046	< 0.4	< 0.4023			
S96T002311	142: 3	Upper ½	< 0.2289	< 0.229	< 0.22895			
S96T002319		Lower ½	< 0.2287	< 0.227	< 0.22785			
S96T002092	142: 4	Upper ½	< 0.2265	< 0.224	< 0.22525			
S96T002105		Lower ½	< 2.098	< 2.09	< 2.094			
S96T002093	142: 5	Upper ½	< 1.835	< 1.93	< 1.8825			
S96T002106		Lower ½	< 2.033	< 1.78	< 1.9065			

Table A-52. Tank 241-S-101 Analytical Results: Europium-155. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002094	142: 6	Upper ½	< 1.512	< 1.49	< 1.501	Cont.	Cont.	Cont.
S96T002091		Lower ½	< 1.438	< 1.49	< 1.464			
S96T002095	142: 7	Upper ½	< 1.459	< 1.51	< 1.4845			
S96T002107		Lower ½	< 2.115	< 2.49	< 2.3025			
S96T002096	142: 8	Upper ½	< 2.387	< 2.31	< 2.3485			
S96T002108		Lower ½	< 2.283	< 2.16	< 2.2215			
Solid composites: fusion digest			**µCi/g**	**µCi/g**	**µCi/g**	**µCi/g**	**%**	**Ci**
S96T002723	138	N/A	< 0.4165	< 0.431	< 0.42375	< 0.438	N/A	< 1,140
S96T002731	142	N/A	< 0.4473	< 0.457	< 0.45215			

Table A-53. Tank 241-S-101 Analytical Results: Strontium-89/90.

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites: fusion digest			µCi/g	µCi/g	µCi/g	µCi/g	%	kg
S96T002723	138	N/A	306	297	301.5	252	19.6	6.53E+05
S96T002731	142	N/A	195	210	202.5			

Table A-54. Tank 241-S-101 Analytical Results: Total inorganic carbon.

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002721	138	N/A	1,640	1,500	1,570	3,760	58.3	9,750
S96T002728	142	N/A	5,900	6,010	5,960			

Table A-55. Tank 241-S-101 Analytical Results: Total organic carbon.

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solid composites			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002721	138	N/A	851	852	851.5	1,990	57.3	5,160
S96T002728	142	N/A	3,100	3,170	3,135			

Table A-56. Tank 241-S-101 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Segment Portion	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids				mg	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)
S96T001899[1]	138: 2R1	Lower ½	1	26.05	125	1,272	--	--	--	--
			2	19.18	112	1,177	189	13.0	--	--
S96T002001[1]	138: 3AR	Whole	1	16.30	122	1,171	--	--	--	--
			2	18.08	127	1,092	--	--	--	--
S96T001889[1]	138: 5	Upper ½	1	21.65	150	1,053	--	--	--	--
			2	22.94	130	1,362	--	--	--	--
S96T001898[1]		Lower ½	1	22.84	127	1,305	--	--	--	--
			2	23.32	130	1,288	--	--	--	--
S96T001958[1]	138: 6	Upper ½	1	11.36	114	831.9	184	84.0	333	23.0
			2	12.64	123	1645	249	10.0	--	--
S96T001959[1]		Lower ½	1	23.01	123	902.3	238	9.0	--	--
			2	11.65	102	814.0	251	56.6	--	--
S96T002167[1]	138: 7	Upper ½	1	46.38	163	944.3	--	--	--	--
			2	60.02	165	864.4	--	--	--	--
S96T002166[1]	138: 7	Lower ½	1	26.62	163	826.5	--	---	--	--
			2	28.33	164	861.0	--	--	--	--
S96T002004[1]	138: 8	Upper ½	1	22.61	133	676.4	271	8.5	--	--
			2	33.30	139	739.7	265	6.2	--	--
S96T002005[1]		Lower ½	1	47.72	138	507.9	210	69.4	--	--
			2	31.11	138	560.7	215	72.5	--	--

Table A-56. Tank 241-S-101 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Segment Portion	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids				mg	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)
S96T002176[2]	138: 9	Upper ½	1	30.44	132	1,323	--	--	--	--
			2	27.54	132	1,424	--	--	--	--
S96T002177[2]		Lower ½	1	47.19	117	992.3	--	--	--	--
			2	66.22	111	709.8	--	--	--	--
S96T002068[1]	142: 1	Upper ½	1	20.86	128	1038	268	24.0	--	--
			2	15.01	131	979.3	272	22.8	--	--
S96T002302[2]	142: 2	Upper ½	1	39.66	115	683.5	244	-21.4	308	-42.8
			2	26.10	119	845.2	252	-7.6	322	-33.7
S96T002303[2]		Lower ½	1	40.60	119	620.4	318.1	-64.3	---	---
			2	24.70	121	889.9	248	-7.0	318	-36.0
S96T002304[1]	142: 3	Upper ½	1	18.78	127	1,090	--	--	--	--
			2	17.00	130	929.7	--	--	--	--
S96T002305[1]		Lower ½	1	23.42	139	884.9	289	14.7	--	--
			2	9.02	115	851.2	185	28.3	--	--
S96T002069[1]	142: 4	Upper ½	1	22.24	131	1,046	410	-10.9	--	--
			2	15.36	106	877.8	193	30.3	--	--
S96T002070[1]		Lower ½	1	21.13	131	999.2	222	14.6	--	--
			2	13.55	112	919.7	219	19.0	--	--

Table A-56. Tank 241-S-101 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Segment Portion	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids				mg	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)
S96T002071[1]	142: 5	Upper ½	1	63.13	132	816.7	--	--	--	--
			2	43.40	135	761.4	--	--	--	--
S96T002072[1]		Lower ½	1	39.01	135	895.7	--	--	--	--
			2	17.12	104	885.1	198	12.8	--	--
S96T002073[1]	142: 6	Upper ½	1	19.74	109	487.1	--	--	--	--
			2	47.17	134	928.7	232	5.04	--	--
S96T002074[1]		Lower ½	1	33.90	131	913.5	--	--	--	--
			2	44.75	150	830.7	--	--	--	--
S96T002075[1]	142: 7	Upper ½	1	30.91	137	1032	--	--	--	--
			2	38.34	153	904.9	--	--	--	--
S96T002076[1]		Lower ½	1	28.59	125	813.8	262	8.31	--	--
			2	42.49	137	874.6	--	--	--	--
S96T002077[1]	142: 8	Upper ½	1	16.74	117	369.9	205	46.4	318	2.1
			2	22.36	129	800.9	459	47.3	--	--
S96T002078[1]		Lower ½	1	18.77	123	864.0	274	1.56	427	26.5
			2	28.59	137	899.8	382	0.51	--	--

Table A-56. Tank 241-S-101 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Segment Portion	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solid composites				mg	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)	Peak Temp. (°C)	Δ H (J/g)
S96T002721[1]	138	N/A	1	38.09	138	702.9	249	8.6	--	--
			2	33.44	140	769.6	251	7.7	--	--
S96T002728[1]	142	N/A	1	26.86	132	742.9	227	19.7	--	--
			2	24.31	139	806.5	234	21.0	--	--
Liquids				mg	Peak Temp. (°C)	Δ H (J/g)	Peak Temp.(°C)	Δ H (J/g)	Peak Temp.(°C)	Δ H (J/g)
S96T001886[1]	138: 1R	DL	1	28.37	126	1,198	277	10.0	--	--
			2	28.86	126	1,207	286	5.73	--	--
S96T001909[1]	138: 2R1	DL	1	31.06	128	1,267	--	--	--	--
			2	30.56	127	1,281	--	--	--	--
S96T002043[1]	138: 3R	DL	1	9.10	107	98.0	207	7.8	451	2.8
			2	9.96	119	1,037	351	115.7	--	--

Notes:

[1] Perkin-Elmer™

[2] Mettler™

Table A-57. Tank 241-S-101 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Segment Portion	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Solids			% H_2O	Temperature Range (°C)	% H_2O	Temperature Range (°C)	% H_2O	% H_2O	%
S96T001899[1]	138: 2R1	Lower ½	52.18	40-190	52.57	40-190	52.375	40.2	3.5
S96T002001[2]	138: 3AR	Whole	46.52	35-220	43.86	35-200	45.19		
S96T001889[2]	138: 5	Upper ½	48.8	26-250	49.14	24-250	48.97		
S96T001898[2]		Lower ½	39.07	28-220	38.84	22-210	38.955		
S96T001958[2]	138: 6	Upper ½	23.21	N/A	38.67	N/A	30.94[QC:e]		
S96T001958[2]		Upper ½	38.84	35-250	39.54	35-250	39.19		
S96T001959[2]		Lower ½	68.84	N/A	37.11	N/A	52.975[QC:e]		
S96T001959[2]		Lower ½	36.38	35-250	36.81	35-240	36.595		
S96T002167[2]	138: 7	Upper ½	38.19	20-250	37.49	35-250	37.84		
S96T002166[2]		Lower ½	32.36	26-270	30.46	30-270	31.41		
S96T002004[2]	138: 8	Upper ½	35.13	35-280	35.34	35-260	35.235		
S96T002005[2]		Lower ½	33.32	35-260	34.18	35-260	33.75		
S96T002176[1]	138: 9	Upper ½	28.35	40-280	33.54	40-260	30.945[QC:e]		
			triplicate		32.84	40-260			
S96T002177[1]		Lower ½	35.58	40-240	33.54	40-240	34.56		
S96T002068[2]	142: 1	Upper ½	44.65	31-200	44.6	21-210	44.625		

Table A-57. Tank 241-S-101 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Segment Portion	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Solids			% H_2O	Temperature Range (°C)	% H_2O	Temperature Range (°C)	% H_2O	% H_2O	%
S96T002302[1]	142: 2	Upper ½	45.23	40-180	44.08	40-170	44.655	Cont.	Cont.
S96T002303[1]		Lower ½	43.31	40-170	42.27	40-160	42.79		
S96T002304[2]	142: 3	Upper ½	40.52	22-190	42.38	21-210	41.525		
S96T002305[2]		Lower ½	40.5	35-190	41.55	35-210	40.95		
S96T002069[2]	142: 4	Upper ½	39.9	20-210	40.2	21-220	40.05		
S96T002070[2]		Lower ½	41.15	23-220	40.88	21-210	41.015		
S96T002071[2]	142: 5	Upper ½	48.32	22-250	47.77	20-250	48.045		
S96T002072[2]		Lower ½	44.34	20-230	37.09	20-240	40.715		
S96T002073[2]	142: 6	Upper ½	38.87	21-230	41.22	21-220	40.045		
S96T002074[2]		Lower ½	37.42	20-250	35.97	30-250	36.695		
S96T002075[2]	142: 7	Upper ½	37.23	35-250	20.74	35-260	28.985[QC:e]		
S96T002075[2]		Upper ½	42.79	35-200	41.1	23-200	41.945		
S96T002076[2]		Lower ½	36.99	35-250	36.14	35-260	36.565		
S96T002077[2]	142: 8	Upper ½	29.25	20-260	27.86	21-250	28.555		
S96T002078[2]		Lower ½	33.74	22-280	32.27	26-260	33.005		

Table A-57. Tank 241-S-101 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Segment Portion	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Solids			% H_2O	Temperature Range (°C)	% H_2O	Temperature Range (°C)	% H_2O	% H_2O	%
Solid composites									
S96T002721[1]	138	Whole	34.76	40-240	36.2	40-240	35.48	38.4	7.5
S96T002728[1]	142	Whole	45.59	40-220	37.13	40-180	41.24[QC:e]		
			triplicate		41.0	40-200			
Liquids									
S96T001886[2]	138: 1R	DL	53.69	24-230	53.71	24-230	53.7	53.1	1.0
S96T001909[2]	138: 2R1	DL	51.71	35-230	52.46	35-230	52.085		
S96T002043[2]	138: 3R	DL	53.76	22-240	53.42	21-230	53.59		

Notes:
[1]Mettler™
[2]Perkin-Elmer™

Table A-58. Tank 241-S-101 Analytical Results: Density/Specific Gravity. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Mean	Overall Mean	RSD (mean)
Solids			g/mL	g/mL	g/mL	g/mL	%
S96T001897	138: 2R1	Lower ½	1.500	---	---	1.65	2.0
S96T001888	138: 5	Upper ½	1.650	---	---		
S96T001896		Lower ½	1.630	---	---		
S96T001953	138: 6	Upper ½	1.660	---	---		
S96T001954		Lower ½	1.670	---	---		
S96T002164	138: 7	Upper ½	1.740	---	---		
S96T002165		Lower ½	1.780	---	---		
S96T002002	138: 8	Upper ½	1.800	---	---		
S96T002003		Lower ½	1.770	---	---		
S96T002174	138: 9	Upper ½	N/A				
S96T002175		Lower ½	N/A				
S96T002057	142: 1	Upper ½	1.530	---	---		
S96T00205		Lower ½	N/A				
S96T002298	142: 2	Upper ½	1.520	---	---		
S96T002299		Lower ½	1.550	---	---		
S96T002300	142: 3	Upper ½	1.580	---	---		
S96T002301		Lower ½	1.620	---	---		

Table A-58. Tank 241-S-101 Analytical Results: Density/Specific Gravity. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Mean	Overall Mean	RSD (mean)
Solids			g/mL	g/mL	g/mL	g/mL	%
S96T002058	142: 4	Upper ½	1.580	---	---	Cont.	Cont.
S96T002059		Lower ½	1.620	---	---		
S96T002060	142: 5	Upper ½	1.660	---	---		
S96T002061		Lower ½	1.710	---	---		
S96T002062	142: 6	Upper ½	1.680	---	---		
S96T002063		Lower ½	1.710	---	---		
S96T002064	142: 7	Upper ½	1.740	---	---		
S96T002065		Lower ½	N/A				
S96T002066	142: 8	Upper ½	N/A				
S96T002067		Lower ½	N/A				
Solids: composites			g/mL	g/mL	g/mL	g/mL	%
S96T002720	138	N/A	1.700	---	---	1.65	3.3
S96T002727	142	N/A	1.590	---	---		
Drainable liquids			g/mL	g/mL	g/mL	g/mL	%
S96T001886	138: 1R	DL	1.342	1.350	1.346	1.36	0.7
S96T001909	138: 2R1	DL	1.356	1.362	1.359		
S96T002043	138: 3R	DL	1.381	1.378	1.379		

APPENDIX B

RESULTS OF HYDROSTATIC HEAD FLUID CONTAMINATION CHECK FOR SINGLE-SHELL TANK 241-S-101

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B.0 RESULTS OF HYDROSTATIC HEAD FLUID CONTAMINATION CHECK FOR SINGLE-SHELL TANK 241-S-101

B.1 INTRODUCTION AND ANALYTE TABLE DESCRIPTION

Appendix B reports the results of the wash water contamination check for the 1996 core sampling event. Lithium and bromide were measured to detect any contamination of the waste samples by the wash water.

The "Sample Number" column in each of the data tables lists the laboratory sample identification number. Sampling rationale, locations, and a description of the sampling event are discussed in Section 3.0.

The "Core:Segment" column specifies the core and segment from which the sample was derived.

The "Subsegment" column specifies the segment portion (subsegment) from which the sample was taken. This can be the entire segment (whole), the drainable liquid portion (DL), upper or lower half segment portions, or quarter segment portions (A refers to top quarter, B refers to second quarter).

The "Result" and "Duplicate" columns are self-explanatory. The "Sample Mean" column lists the average of the result and duplicate values. If the result and duplicate values were both detected, or one of the two values is detected and the other non-detected, then the mean is expressed as a detected value. If the result and duplicate values were both nondetected, then the mean is expressed as a nondetected. The result and duplicate values, as well as the result/duplicate means, are reported in the tables exactly as found in the original laboratory data package. The means may appear to have been rounded up in some cases and rounded down in others. This is because the analytical results given in the tables may have fewer significant figures than originally reported, not because the means were incorrectly calculated.

The four quality control parameters assessed on the tank 241-S-101 samples were standard recoveries, spike recoveries, duplicate analyses (RPDs), and blanks. These were summarized in Section 5.1.2. More specific information is provided in the following appendix tables. Sample and duplicate pairs in which any of the QC parameters were outside their specified limits are superscripted in the "Sample Mean" column as follows:

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

Table B-1. Tank 241-S-101 Analytical Results: Lithium. (3 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean
Solids: fusion digest			µg/g	µg/g	µg/g
S96T001903	138: 2R1	Lower ½	< 197	< 186	< 191.5
S96T002040	138: 3AR	Whole	< 204	< 191	< 197.5
S96T001891	138: 5	Upper ½	< 210	< 212	< 211
S96T001902		Lower ½	< 181	< 176	< 178.5
S96T002045	138: 6	Upper ½	< 192	< 189	< 190.5
S96T002047		Lower ½	< 207	< 191	< 199
S96T002193	138: 7	Upper ½	< 208	< 212	< 210
S96T002202		Lower ½	< 200	< 200	< 200
S96T002046	138: 8	Upper ½	< 205	< 209	< 207
S96T002048		Lower ½	< 189	< 204	< 196.5
S96T002194	138: 9	Upper ½	< 193	< 205	< 199
S96T002199		Lower ½	< 213	< 208	< 210.5
S96T002090	142: 1	Upper ½	< 206	< 205	< 205.5
S96T002310	142: 2	Upper ½	< 188	< 185	< 186.5
S96T002316		Lower ½	< 204	< 203	< 203.5
S96T002311	142: 3	Upper ½	< 202	< 206	< 204
S96T002319		Lower ½	< 195	< 191	< 193
S96T002092	142: 4	Upper ½	< 202	< 200	< 201
S96T002105		Lower ½	< 200	< 206	< 203
S96T002093	142: 5	Upper ½	< 194	< 187	< 190.5
S96T002106		Lower ½	< 204	< 187	< 195.5
S96T002094	142: 6	Upper ½	< 207	< 203	< 205
S96T002091		Lower ½	< 206	< 205	< 205.5

Table B-1. Tank 241-S-101 Analytical Results: Lithium. (3 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean
Solids: fusion digest (Cont.)			**µg/g**	**µg/g**	**µg/g**
S96T002095	142: 7	Upper ½	< 199	< 201	< 200
S96T002107		Lower ½	< 215	< 217	< 216
S96T002096	142: 8	Upper ½	< 199	< 198	< 198.5
S96T002108		Lower ½	< 204	< 200	< 202
Solids: acid digest			**µg/g**	**µg/g**	**µg/g**
S96T001905	138: 2R1	Lower ½	< 3.81	< 3.87	< 3.84
S96T001892	138: 5	Upper ½	< 3.82	< 4.03	< 3.925
S96T001904		Lower ½	< 3.58	< 3.92	< 3.75
S96T002049	138: 6	Upper ½	< 3.76	< 3.89	< 3.825
S96T002050		Lower ½	< 3.71	< 4.09	< 3.9
S96T002195	138: 7	Upper ½	< 4.4	< 4.49	< 4.445
S96T002203		Lower ½	< 3.91	< 4.08	< 3.995
S96T002051	138: 8	Upper ½	< 3.69	< 3.8	< 3.745
S96T002052		Lower ½	< 3.79	< 3.91	< 3.85
S96T002196	138: 9	Upper ½	34.4	24.9	29.65[QC:e]
S96T002200		Lower ½	< 3.68	< 3.98	< 3.83
S96T002097	142: 1	Upper ½	< 3.57	< 3.57	< 3.57
S96T002312	142: 2	Upper ½	< 4.09	< 3.68	< 3.885
S96T002317		Lower ½	< 3.73	< 3.91	< 3.82
S96T002313	142: 3	Upper ½	< 4.1	< 4.05	< 4.075
S96T002320		Lower ½	< 4.17	< 4.01	< 4.09
S96T002109	142: 4	Upper ½	< 4.01	< 4.09	< 4.05
S96T002110		Lower ½	< 3.93	< 3.86	< 3.895

Table B-1. Tank 241-S-101 Analytical Results: Lithium. (3 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean
Solids: acid digest (Cont.)			**µg/g**	**µg/g**	**µg/g**
S96T002111	142: 5	Upper ½	< 3.53	< 3.86	< 3.695
S96T002112		Lower ½	< 3.57	< 3.82	< 3.695
S96T002113	142: 6	Upper ½	< 3.89	< 4.48	< 4.185
S96T002098		Lower ½	< 3.93	< 4.08	< 4.005
S96T002114	142: 7	Upper ½	< 3.96	< 4.02	< 3.99
S96T002115		Lower ½	< 3.67	< 3.58	< 3.625
S96T002116	142: 8	Upper ½	< 3.71	< 3.6	< 3.655
S96T002117		Lower ½	< 3.75	< 3.7	< 3.725
Solid composites: fusion digest			**µg/g**	**µg/g**	**µg/g**
S96T002723	138	N/A	< 209	< 217	< 213
S96T002731	142	N/A	< 204	< 210	< 207
Solid composites: acid digest			**µg/g**	**µg/g**	**µg/g**
S96T002724	138	N/A	< 6.86	< 6.82	< 6.84
S96T002733	142	N/A	< 6.77	< 6.35	< 6.56
Solid composites: H_2O/acid dilution			**µg/g**	**µg/g**	**µg/g**
S96T002726	138	N/A	< 5.62	< 5.46	< 5.54
S96T002736	142	N/A	< 5.48	< 5.04	< 5.26
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**
S96T001886	138: 1R	DL	< 4.01	< 4.01	< 4.01
S96T001909	138: 2R1	DL	< 4.01	< 4.01	< 4.01
S96T002043	138: 3R	DL	< 4.01	< 4.01	< 4.01

Table B-2. Tank 241-S-101 Analytical Results: Bromide. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean
Solids: water digest			µg/g	µg/g	µg/g
S96T001907	138: 2R1	Lower ½	< 1,088	< 1,030	< 1,059
S96T001893	138: 5	Upper ½	< 882.2	< 948	< 915.1
S96T001906		Lower ½	< 957.6	< 882	< 919.8
S96T003326	138: 6	Upper ½	< 498.8	< 490	< 494.4
S96T003327		Lower ½	< 520.1	< 515	< 517.55
S96T003497	138: 7	Upper ½	< 525.6	< 526	< 525.8
S96T003498		Lower ½	< 355.1	< 352	< 353.55
S96T003463	138: 8	Upper ½	< 309.4	< 309	< 309.2
S96T003464		Lower ½	< 367.9	< 369	< 368.45
S96T003461	138: 9	Upper ½	< 360.8	< 350	< 355.4
S96T003462		Lower ½	< 346.6	< 333	< 339.8
S96T002099	142: 1	Upper ½	< 508.1	< 527	< 517.55
S96T002314	142: 2	Upper ½	< 494.5	< 504	< 499.25
S96T002318		Lower ½	< 497.4	< 508	< 502.7
S96T002315	142: 3	Upper ½	< 528.9	< 540	< 534.45
S96T003499		Lower ½	< 342.4	< 338	< 340.2
S96T002118	142: 4	Upper ½	< 524.3	< 510	< 517.15
S96T002119		Lower ½	< 503.4	< 500	< 501.7
S96T002120	142: 5	Upper ½	< 486.4	< 512	< 499.2
S96T002121		Lower ½	< 496.2	< 482	< 489.1
S96T002122	142: 6	Upper ½	< 527.9	< 538	< 532.95

Table B-2. Tank 241-S-101 Analytical Results: Bromide. (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Result	Duplicate	Sample Mean
Solids: water digest			**µg/g**	**µg/g**	**µg/g**
S96T002100		Lower ½	< 520.1	< 525	< 522.55
S96T002123	142: 7	Upper ½	< 540.7	< 487	< 513.85
S96T002124		Lower ½	< 471	< 486	< 478.5
S96T002125	142: 8	Upper ½	< 265.6	< 257	< 261.3
S96T002126		Lower ½	< 537.6	< 546	< 541.8
Solid composites: water digest			**µg/g**	**µg/g**	**µg/g**
S96T002725	138	N/A	< 579.5	< 563	< 571.25
S96T002735	142	N/A	< 564.9	< 520	< 542.45
Drainable liquids			**µg/mL**	**µg/mL**	**µg/mL**
S96T001886	138: 1R	DL	< 1,285	< 1,290	< 1,287.5
S96T001909	138: 2R1	DL	< 1,285	< 1,290	< 1,287.5
S96T002043	138: 3R	DL	993.7	999	996.35

APPENDIX C

EARLIER SAMPLING EVENTS

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C.0 ANALYTICAL RESULTS FROM HISTORICAL SAMPLING EVENTS

Appendix C presents analytical results from the historical sampling events of tank 241-S-101. Because of the active process history of the tank, only the results from the 1991 sampling event (presented in Table C-1) have been deemed representative of the current tank contents. Data from the remaining sampling events have been included in this appendix for informational purposes only. A description of the sampling event can be found in the respective source document, which is listed in the footnotes to each table.

Table C-1. Sample from Tank 241-S-101.[1]

Sample Status Report		
Sample No. T-8579		
Received: December 17, 1991		
Physical Data		
Appearance/OTR	Clear, yellow, no solids	
Radiation	1 rad/hr	
pH	13.4	
Chemical Analysis		
Component	Lab Value	Lab Unit
Al	0.576	M
CN	Incomplete	
TIC	4.66	g/L
TOC	3.21	g/L
F	6,640	ppm
NO_2	2.10	M
NO_3	1.97×10^5	ppm

Notes:

TIC = total inorganic carbon

[1]WHC (1991)

Table C-2. Sample from Tank 241-S-101.[1]

Waste Tank 241-S-101		
Sample T-9715, Received November 19, 1975		
Physical Data		
Visual - OTR	Yellow/black with suspended solids	
Radiation	2 rad/hr	
pH	13.6	
Percent Water	42.82	
Specific Gravity	1.51 at 64.5°C	
Chemical Analysis		
Component	Lab Value	Lab Unit
OH	3.60	M
Al	1.82	M
NO_2	0.318	M
NO_3	4.68	M
CO_3	0.318	M
NH_4	0.0194	M
Radiological Analysis		
Component	Lab Value	Lab Unit
^{134}Cs	8,210	μCi/gal
^{137}Cs	2.44×10^6	μCi/gal
^{103}Ru	< 1,270	μCi/gal

Note:
[1]Wheeler (1975)

Table C-3. Sludge Sample from Tank 241-S-101.[1]

Waste Tank 241-S-101		
Received June 4, 1975		
Physical Data		
Percent Water	37.4	
Bulk Density	1.52	
Particle Density	1.91	
Chemical Analysis		
Component	Lab Value	Lab Unit
Al	4.75	M
Fe	0.08	M
NO_2	<0.2	M
NO_3	9.08	M
PO_4	0.08	M
Mg	0.05	M
Mn	0.08	M
Radiological Analysis		
Component	Lab Value	Lab Unit
Pu	5.97×10^6	g/L
$^{89+90}Sr$	1.01×10^6	μCi/L
^{137}Cs	2.95×10^5	μCi/L

Note:
[1]Horton (1975)

Table C-4. Sample from Tank 241-S-101.[1]

Waste Tank 241-S-101		
Sample T-8084		
Received September 13, 1974		
Physical Data		
Visual - OTR	Milky yellow, no solids	
Radiation	250 mrad/hr	
pH	14	
Percent Water	81.90	
Specific Gravity	1.205	
Chemical Analysis		
Component	Lab Value	Lab Unit
OH	0.415	M
Al	0.333	M
Na	2.90	M
NO_2	0.197	M
NO_3	1.53	M
SO_4	0.00878	M
PO_4	0.0934	M
CO_3	0.111	M
F	0.00355	M
Radiological Analysis		
Component	Lab Value	Lab Unit
Pu	$<4.43 \times 10^{-6}$	g/gal
^{134}Cs	2180	μCi/gal
^{137}Cs	4.05×10^{5}	μCi/gal
$^{89+90}Sr$	409	μCi/gal

Note:
[1]Wheeler (1974)

Table C-5. Sample from Tank 241-S-101.[1]

Characterization Analysis of Tank 101-S		
Component	Lab Value	Lab Unit
Specific Gravity	1.412	---
Viscosity at 50°C	2.23	---
CO_3	0.011	M
NO_3	3.82	M
NO_2	0.642	M
TAD	3.62	---
Al	1.41	M
Na	9.01	M
^{137}Cs	155	μCi/mL

Note:
[1]Puryear (1971)

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