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1, 2	1	Cog. Mgr. J.G. Kristofzski		9-18-96							
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Tank Characterization Report for Single-Shell Tank 241-U-107

Jaiduk Jo
Westinghouse Hanford Company, Richland, WA 99352
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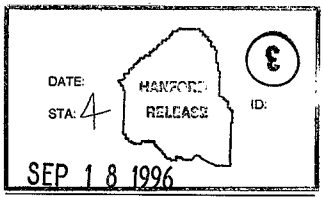
Abstract: This document summarizes the information on the historical uses, present status, and the sampling and analysis results of waste stored in Tank 241-U-107. This report supports the requirements of the Tri-Party Agreement Milestone M-44-09.



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Tank Characterization Report for Single-Shell Tank 241-U-107

J. Jo
Westinghouse Hanford Company

B. J. Morris
T. T. Tran
Los Alamos Technical Associates

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

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington

Management and Operations Contractor for the
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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-U-107 and the results of the February 1995 vapor sampling event. This report supports requirements of the *Hanford Federal Facility Agreement and Consent Order*, Milestone M-44-09 (Ecology et al. 1996).

Tank 241-U-107 is in the 200 West Area U Tank Farm on the Hanford Site. The tank is the first in a cascade series of three tanks that end with tanks 241-U-108 and 241-U-109. The tank went into service in 1948, receiving metal waste from T Plant. Transfers continued until the third quarter of 1949 when the entire cascade was filled. No further transfers occurred until the third quarter of 1953 when the tank contents were pumped to tank 241-U-109 for uranium recovery. During its long service life, the tank has received waste from T Plant, REDOX, N-Reactor, Pacific Northwest National Laboratory, and several other tanks. Currently, the tank is out of service, categorized as sound, and contains double-shell slurry feed. Partial intrusion prevention was completed in December 1982. It is on the Organics and Hydrogen/Flammable Gas Watch Lists.

The tank has an operating capacity of 2,010 Kl (530 kgal) and presently contains an estimated 1,537 Kl (406 kgal) of waste. The total amount is estimated to be composed of 117 kL (31 kgal) of supernate, 57 kL (15 kgal) of sludge, and 1,363 kL (360 kgal) of saltcake (Hanlon 1996). Table ES-1 and Figure ES-1 describe tank 241-U-107 and it status.

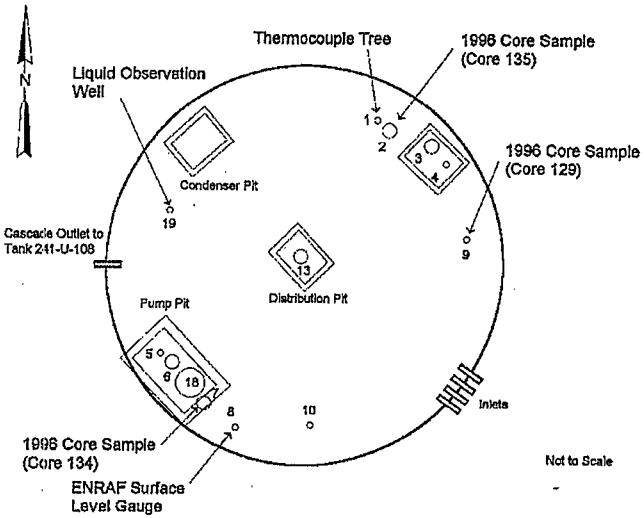
Table ES-1. Description and Status of Tank 241-U-107.

TANK DESCRIPTION	
Type	Single-shell
Constructed	1943 to 1944
In service	1948
Diameter	22.9 m (75.0 ft)
Operating depth	5.2 m (17 ft)
Capacity	2,010 kL (530 kgal)
Bottom shape	Dish
Ventilation	Passive
TANK STATUS	
Waste classification	Double-shell slurry feed
Total waste volume	1,537 kL (406 kgal)
Supernatant volume (April 30, 1996)[1]	117 kL (31 kgal)
Sludge volume	57 kL (15 kgal)
Saltcake volume	1,363 kL (360 kgal)
Waste surface level (1981 to 1996)	3.50 m (11.5 ft) to 3.97 m (13 ft)
Temperature (7/87 to 7/96)	17 °C (62 °F) to 32 °C (89 °F)
Integrity	Sound
Watch Lists	Organic and hydrogen and flammable gas
SAMPLING DATES	
Core samples	February and March 1996
Grab samples	April 1995
Vapor samples	February 1995
SERVICE STATUS	
Out of service	November 1980
Partial intrusion prevention	December 1982

Note:

[1]The volume has not changed since the time of the core sampling in February and March 1996.

Figure ES-1. Profile of Tank 241-U-107.



Total Tank Volume: 2,010 kL (530 kgal)
Waste Volume (April 1996): 1,537 kL (406 kgal)
Sludge Volume (April 1996): 57 kL (15 kgal)
Saltcake Volume (April 1996): 1,363 kL (360 kgal)
Supernate Volume (April 1996): 117 kL (31 kgal)

Tank 241-U-107 was sampled in February and March 1996 to satisfy the requirements of the *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Data Quality Objectives for Tank Farms Waste Compatibility Program* (Fowler 1995), and *Data Quality Objective to Support Resolution of the Organic Complexant Safety Issue* (Turner et al. 1995). This sampling effort involved taking push-mode core samples of tank waste from three risers. The sampling and analyses were performed in accordance with the *Tank 241-U-107 Push Mode Core Sampling and Analysis Plan* (Jo 1996c). All analyses were performed at the Westinghouse Hanford Company 222-S Laboratory. The headspace gas and vapor samples were collected and analyzed to satisfy data quality objectives (DQOs) for generic in-tank health and safety issue resolution (Osborne et al. 1994). This report also summarizes the results from the February 1995 vapor sampling event. In addition, a grab sample was taken in April 1995. Results from the grab sampling have been subjected to a waste compatibility evaluation.

The purpose of the safety screening DQO is to identify unknown safety issues and to evaluate the tank for placement on a Watch List. To accomplish this, the safety screening DQO requires a measurement of the total fuel content of the waste by differential scanning calorimetry (DSC), weight percent water by thermogravimetric analysis (TGA), bulk density (solids) or specific gravity (liquids), total alpha activity by alpha proportional counting, and a visual examination of the waste samples for an organic layer (liquids only). The safety screening DQO also requires the determination of the flammability of tank headspace gases. To satisfy this requirement, the flammability of the tank headspace was measured as a percent of the lower flammability limit (LFL) using a combustible gas meter. The sampling

and analysis plan (SAP) requires analyses for lithium and bromide to check for wash water contamination of the samples during sampling operations.

The waste compatibility DQO governs the acquisition of analytical data which assist the tank farm operators in performing nonroutine transfers. The waste compatibility DQO requires the same analyses as the safety screening DQO and analysis for selected metals by inductively coupled plasma (ICP) spectroscopy, anions by ion chromatography (IC), pH, radionuclides, and total carbon.

The organic DQO is used to assess the possibility of an exothermic reaction between precipitated nitrate or nitrite salts and organic complexants. The organic DQO also requires analyses for DSC and TGA and selected metals by ICP and total organic carbon (TOC).

All analyses performed on tank 241-U-107 except for DSC and TGA, exhibited results well within the limits imposed by the safety screening and organic DQOs. Two liquid samples had dry weight DSC exothermic reactions with changes in enthalpy exceeding the safety screening DQO decision threshold of -480 J/g. The mean result of core 135, segment 1 was -558.7 J/g, and the mean result of core 135, segment 1R was -537.6 J/g. However, the weight percent water results for these samples ranged from 47.0 to 52.7, well above the

organic DQO decision limit of 17 weight percent water. All exothermic results from the solids were below the decision threshold; the largest of the upper limits to one-sided 95 percent confidence intervals on the mean was -467.8 J/g.

For the solid segment portions from the tank, six sample means for weight percent water were below the organic complexant DQO threshold of 17 percent. However, because no DSC result violated the limit, secondary analyses were not performed. The DQOs have established a decision threshold of 30,000 μg C/g for TOC (dry weight basis). After converting to dry weight, all results were well below the decision threshold. The highest reported solid result was 16,100 μg C/g, and the highest reported liquid result was 13,700 μg C/mL. The highest of the upper limit to a one-sided 95 percent confidence interval on the mean for all samples was 20,400 μg C/g. The mean total alpha activity for solids was 0.102 μCi/g, and the overall mean for liquids was $<$ 0.0108 μCi/mL, well below the decision limits of 32.7 μCi/g and 61.5 μCi/mL. The upper limit to one-sided 95 percent confidence intervals on the mean ranged between 0.00240 μCi/mL and 0.0165 μCi/mL for liquids and between 0.00320 μCi/g and 1.71 μCi/g for solids. Finally, the highest recorded concentration of flammable gases in the tank headspace was 4 percent of the LFL, well below the limit of 25 percent of the LFL. Together, the data do not appear to support placement of the tank on the Organic Watch List.

Comparisons also were made between the liquid analytical results and the safety and operational decision thresholds of the waste compatibility DQO (Fowler 1995). All results satisfied their respective safety criteria and operational analytical requirements. The estimate

of the supernate heat load based on analytical data was 189 W (645 Btu/hr), indicating no waste compatibility concerns. The total tank heat load estimate from radionuclide data was 1,017 W (3,470 Btu/hr). The historical tank content estimate (HTCE) prediction was 2,520 W (8,600 Btu/hr) (Agnew et al. 1996a), and an estimate based on the tank headspace temperature was 1,610 W (5,480 Btu/hr) (Kummerer 1994). The average tank temperature between July 1987 and July 1996 was 24.7 °C (76.4 °F), the minimum temperature was 17 °C (62 °F), and the maximum temperature was 32 °C (89 °F). The tank has exhibited an upper temperature extreme in the past, which no longer exhibits, therefore, it may be concluded that any heat generated from radioactive sources is adequately dissipated.

Because the weight percent water, total alpha, and TOC results met the criteria of the safety screening and organic DQOs, the tank may be considered conditionally safe. However, the bottom two to five segments of tank waste were not sampled. As a result, the tank must be resampled to satisfy the safety screening and organic DQOs.

Table ES-2 shows the results for major analytes and analytes of concern from 1996 core sample and 1995 grab sample. The liquid inventory was calculated by multiplying the supernate mean by the supernate waste volume and dividing by a unit conversion factor of 1E+06. The solid inventory was calculated by multiplying the solid mean by the solid density and the solid waste volume and dividing by a unit conversion factor of 1E+06. The total inventory was the sum of liquid and solid inventories.

Table ES-2. Major Analytes and Analytes of Concern.[1,2] (2 sheets)

Analyte	Mean Solid Concentration	Solid RSD (Mean)	Mean Liquid Concentration	Liquid RSD (Mean)	Total Inventory
METALS	μg/g	%	μg/mL	%	kg
Aluminum	7,620	26.8	23,100	3.5	19,100
Chromium	2,410	36.9	567	35.3	5,270
Phosphorous	2,720	53.1	1,130	3.7	6,000
Potassium	819	16.5	3,150	7.6	2,140
Sodium	2.01E+05	4.1	2.19E+05	1.8	4.60E+05
Sulfur	721	23.5	2,110	14.8	1,810
ANIONS	μg/g	%	μg/mL	%	kg
Chloride	2,320	19.0	7,900	4.3	5,930
Hydroxide	---	---	26,600	2.9	3,110
Nitrate	4.81E+05	12.4	2.38E+05	14.0	1.07E+06
Nitrite	25,100	18.6	96,200	4.3	65,500
Oxalate	3,120	28.5	1,070	47.3	6,860
Phosphate	12,300	39.5	3,830	15.8	26,900
Sulfate	4,490	27.5	6,390	13.4	10,400
RADIONUCLIDES	μCi/g	%	μCi/mL	%	Ci
Total alpha	0.102	38.6	< 0.0108	n/a	221
^{137}Cs	76.8	19.4	338	19.0	2.06E+05
CARBON	μg C/g	%	μg C/mL	%	kg
Total inorganic carbon	2,750	28.7	5,400	12.1	6,570
Total organic carbon	2,070	30.5	4,070	7.9	4,950

Table ES-2. Major Analytes and Analytes of Concern.[1,2] (2 sheets)

Analyte	Mean Solid Concentration	Solid RSD (Mean)	Mean Liquid Concentration	Liquid RSD (Mean)	Total[3] Inventory
PHYSICAL PROPERTIES	Solid Mean	%	Supernate Mean	%	kg
Weight percent water	22.7%	16.3	49.6%	1.6	5.73E+05
Density	1.52 g/mL	4.1	1.43 g/mL	1.5	---

Note:

n/a = not applicable

[1]Jo 1996b

[2]Esch 1995

[3]Sum of liquid and solid inventories

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LIST OF TERMS

ANOVA	analysis of variance
ASTM	American Society of Testing and Materials
Btu/hr	British thermal units per hour
Ci	curies
Ci/g	curies per gram
Ci/L	curies per liter
cm	centimeters
c/s	counts per second
CWR1	cladding waste from REDOX, 1952-60
DL	drainable liquid
DQO	data quality objective
DSC	differential scanning calorimetry
ft	feet
g	grams
GEA	gamma energy analysis
g/gal	grams per gallon
g/L	grams per liter
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	meters
mg	milligrams
mR/hr	milliroentgens per hour
NFPA	National Fire Protection Association
ppm	parts per million
ppmv	parts per million by volume
REDOX	Reduction-Oxidation
Rev.	revision
RPD	relative percent difference
RSD	relative standard deviation
SACS	Surveillance Analysis Computer System

LIST OF TERMS (Continued)

SAP	sampling and analysis plan
SMM	Supernate Mixing Model
SMMS2	Supernate Mixing Model Salt Slurry from 242-S campaign, 1977-80
SMMT2	Supernate Mixing Model Saltcake from 242-T campaign, 1965-76
SpG	specific gravity
S2	Salt Slurry from 242-S Evaporator, 1977-80
TGA	thermogravimetric analysis
TLM	Tank Layer Model
TIC	total inorganic carbon
TOC	total organic carbon
TRU	transuranic
W	watts
WSTRS	Waste Status and Transaction Record Summary
wt %	weight percent
°C	degrees Celsius
°F	degrees Fahrenheit
ΔH	change in enthalpy
μCi/g	microcuries per gram
μCi/L	microcuries per liter
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 provides an overview of single-shell tank 241-U-107 and its waste contents. It provides estimated concentrations and inventories for waste constituents based on the latest sampling and analysis activities combined with background tank information. Tank 241-U-107 was core sampled in February and March 1996 and grab sampled in April 1995 in accordance with the *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Data Quality Objective to Support Resolution of the Organic Complexant Safety Issue* (Turner et al. 1995), and *Data Quality Objectives for Tank Farms Waste Compatibility Program* (Fowler 1995). The requirements of the three DQOs are integrated in the sampling and analysis plan (Jo 1996c).

Tank 241-U-107 is out of service as are all single-shell tanks. It is categorized as sound and partial intrusion prevention was completed. For these reasons, the composition of the tank waste should not change appreciably until pretreatment and retrieval activities begin. The concentration and inventory values reported reflect the best composition estimates of the waste based on available analytical data and historical models. This report supports the requirements of the *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-U-107. When possible, this information will be used to assess issues associated with safety, operational, environmental, and process activities. This report also serves as a reference for more detailed information about tank 241-U-107.

1.2 SCOPE

The February and March 1996 core sampling event was guided by the requirements of three DQOs: the safety screening DQO (Dukelow et al. 1995), the organic DQO (Turner et al. 1995), and the waste compatibility DQO (Fowler 1995). The objective of the safety screening DQO was to assess tank waste safety and to identify unknown safety issues associated with the waste. The objective of the organic DQO was to assess the possibility of an exothermic reaction between precipitated nitrate or nitrite salts and organic complexants. The waste compatibility DQO addressed issues associated with combining wastes from two or more sources. The SAP summarized the requirements of the three DQOs and required the following analyses: DSC (to evaluate fuel level and energetics), TGA (to determine moisture content), total alpha activity (to determine criticality potential), metals by ICP, anions by IC,

alpha proportional counting, beta proportional counting, gamma energy analysis, total inorganic carbon (TIC), TOC, hydroxide, pH, specific gravity (SpG), and a visual check for an organic layer. In addition, the tank headspace was sampled for the presence of flammable gases.

2.0 HISTORICAL TANK INFORMATION

This section describes tank 241-U-107 and its contents based on historical information. It discusses the current condition of the tank, tank design, transfer history, and process sources that contributed to the tank waste, including an estimate of the current contents based on the process history. The discussion includes information about events that may be related to tank safety issues, such as potentially hazardous tank contents or off-normal operating temperatures and 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 used to evaluate the heat generating characteristics of the waste.

2.1 TANK STATUS

In April 1996, tank 241-U-107 contained an estimated 1,537 kL (406 kgal) of waste classified as double-shell slurry feed (Hanlon 1996). The liquid waste volume was estimated with an automatic ENRAF[1] surface level gauge, and the solid waste volume was estimated with a sludge measurement device. The solids volume was updated on December 30, 1983. Table 2-1 provides estimates of the amounts of various waste phases in the tank.

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

Waste Form	Estimated Volume	
	kL	kgal
Total Waste	1,537	406
Supernatant Liquid	117	31
Sludge	57	15
Saltcake	1,363	360
Drainable Interstitial Liquid	556	147
Drainable Liquid Remaining	674	178
Pumpable Liquid Remaining	591	156

Note:
[1]Hanlon (1996)

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

Tank 241-U-107 is out of service as are all single shell tanks. It is categorized as sound with partial intrusion prevention completed in December 1982. The tank is currently on the Organics and Hydrogen and Flammable Gas Watch Lists. The tank is passively ventilated (Hanlon 1996). All monitoring systems were in compliance with documented standards as of April 30, 1996 (Hanlon 1996).

2.2 TANK DESIGN AND BACKGROUND

The 241-U Tank Farm was constructed during 1943 and 1944 in the 200 West Area of the Hanford Site. The farm contains 12 100-series tanks and four 200-series tanks. The 100-series tanks have a capacity of 2,010 kL (530 kgal), a diameter of 22.9 m (75.0 ft), and an operating depth of 5.2 m (17 ft) (Leach and Stahl 1996). Tank 241-U-107, a 100-series tank, began receiving waste September 1948 (Agnew et al. 1996b). Built according to the first generation design, the 241-U Tank Farm was designed for nonboiling waste with a maximum fluid temperature of 104 °C (220 °F). A cascade overflow line 7.5 cm (3 in.) in diameter connects tank 241-U-107, the first in a cascade series of three tanks that includes 241-U-108 and U-109. Each tank in the cascade series is one foot lower in elevation than the preceding tank. The cascade overflow height is approximately 4.9 m (16 ft) from the tank bottom and 60 cm (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-U-107 was designed with a primary mild steel liner (ASTM A283 Grade C) and a concrete dome with risers. The tank is set on a reinforced concrete foundation. The tank and foundation were waterproofed with a coating of tar and covered by a three-ply, asphalt-impregnated, waterproofing fabric. The waterproofing was protected by a welded wire-reinforced, cement-like mixture. Two coats of primer were sprayed on all exposed interior tank surfaces (Rogers and Daniels 1944). The tank ceiling dome was covered with three applications of magnesium zinc fluorosilicate wash. 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. This tank was covered with approximately 2.1 m (7 ft) of overburden.

According the drawings and engineering change notices, tank 241-U-107 has 13 risers. The risers range in diameter from 10 cm (4 in.) to 1.1 m (3.5 ft). Table 2-2 shows numbers, diameters, and descriptions of the risers and the inlet, overflow, and spare nozzles. Figure 2-1 shows the riser configuration. Riser 9 (10 cm [4 in.] in diameter) and risers 2 and 7 (30 cm [1 ft] in diameter) are available for any use (Lipnicki 1996). Riser 10(10 cm [4 in.] in diameter) is available only for vapor sampling because a Standard Hydrogen Monitoring System is installed on it. Figure 2-2 is a tank cross section showing the approximate waste level and a schematic of the tank equipment.

Table 2-2. Tank 241-U-107 Risers.[1,2,3,4]

Riser Number	Diameter		Description and Comments
	cm	in.	
1	10	4	Thermocouple tree
2	30	12	Dip tubes - B-222 observation port, benchmark
3	30	12	Sluicing nozzle, weather covered
4	10	4	Recirculation dip tubes, weather covered
5	10	4	Recirculation dip tubes, weather covered
6	30	12	Sluicing nozzle, weather covered
7	30	12	Observation port
8	10	4	ENRAF® gauge
9	10	4	Sludge measurement port, benchmark
10	10	4	Breather filter
13	30	12	Distribution jet
18	110	42	Sludge pump, weather covered
19	10	4	B-436 liquid observation well
Nozzle Number	**Diameter**		**Description and Comments**
	cm	in.	
N1	8	3	Overflow inlet
N2	8	3	Overflow inlet
N3	8	3	Overflow inlet
N4	8	3	Spare
N5	8	3	Overflow outlet to tank 241-U-108

Notes:

[1]Alstad (1993)
[2]Tran (1993)
[3]Vitro Engineering Corporation (1979)
[4]ARHCO (1976)

Figure 2-1. Riser Configuration for Tank 241-U-107.

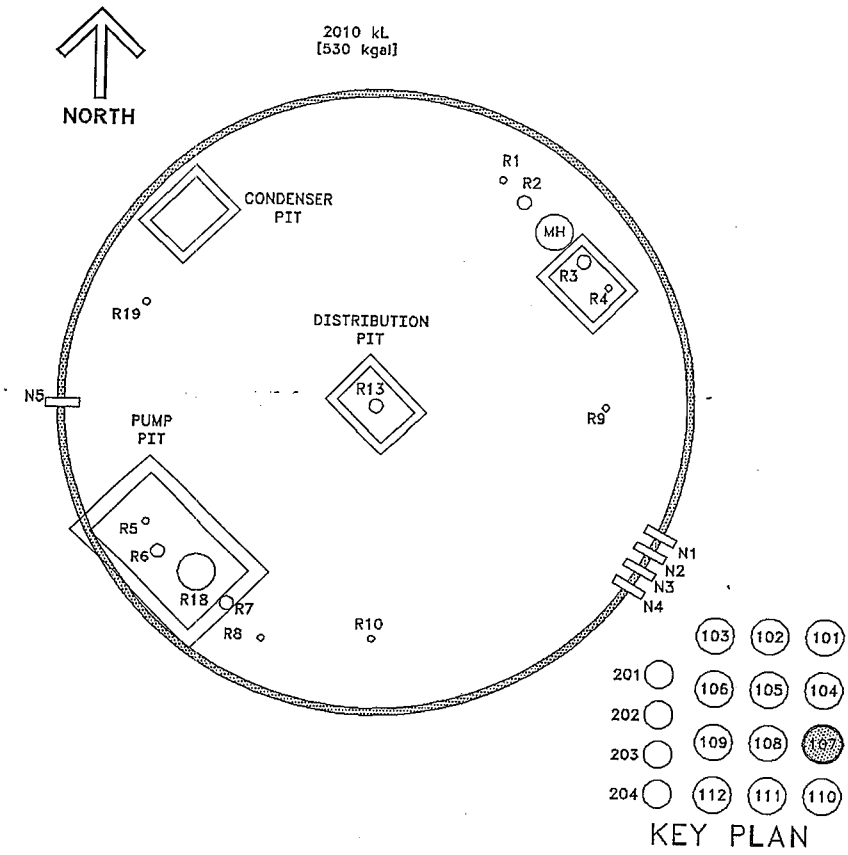
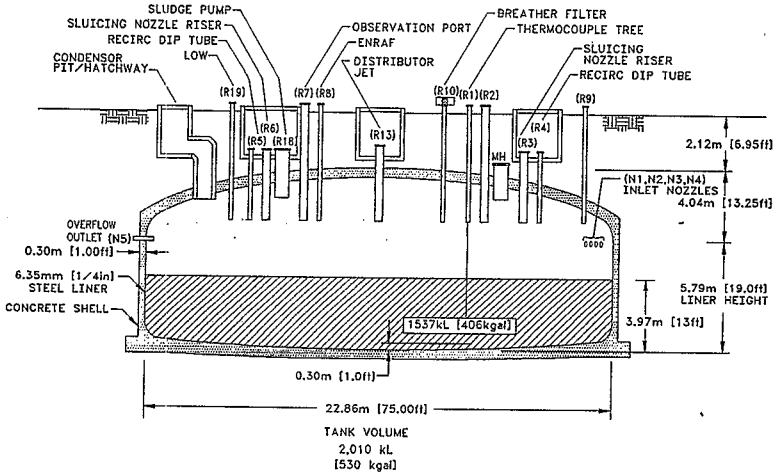


Figure 2-2. Tank 241-U-107 Cross-Section.



2.3 PROCESS KNOWLEDGE

Section 2.3.1 describes the major transfers into and out of tank 241-U-107. Table 2-3 is a chronological list of major transfers. Section 2.3.2 contains an estimate of the tank's contents based on historical data.

2.3.1 Waste Transfer History

Tank 241-U-107 first received metal waste from T Plant in September 1948 and was full by December 1948. The waste cascaded from tank 241-U-107 until the third quarter of 1949 when the final tank in the series, 241-U-109, was filled.

No transfers occurred from the third quarter of 1949 to the third quarter of 1953 when tank contents were transferred to tank 241-U-109 for uranium recovery. The heel was sluiced in the third quarter of 1953.

Beginning in the second quarter of 1954, tank 241-U-107 again was filled with metal waste as part of the T Plant active metal cascade campaign. Some waste was cascaded to tank 241-U-108. The cascade continued until the fourth quarter of 1954. No more transfers were made until the fourth quarter of 1955 when waste was transferred to tank 241-U-109 for uranium recovery. The heel remaining in the tank was jet sluiced in the first quarter of 1956.

In the third quarter of 1957, tank 241-U-107 received REDOX coating waste supernate from tank 241-S-107. Similar transfers occurred in the first and second quarters of 1958 and the second quarter of 1959. There were no further transfers until the third quarter of 1968 when waste was sent to tank 241-U-108 and received from tank 241-S-107.

Additional supernate was received from tank 241-SX-105 in the first and second quarters of 1969. Flush water was also received in the second quarter of 1969. Some waste was transferred to tank 241-U-108 in the second quarter of 1969. In the fourth quarter of 1969, waste was received from tank 241-S-107, and some of it was sent to tank 241-U-109. During first quarter of 1972, waste was sent to tank 241-TX-101.

In the third quarter of 1972, tank 241-U-107 received N-Reactor waste, supernatant waste from tank 241-T-112, and Pacific Northwest Laboratory waste. Some waste was sent to tank 241-U-108. In the fourth quarter of 1972, tank 241-U-107 received Pacific Northwest Laboratory waste and supernatant waste from tank 241-T-112. In the same quarter, waste was sent to tanks 241-C-104 and 241-U-108.

In the first and second quarters of 1973, tank 241-U-107 again received N-Reactor waste, supernatant waste from tank 241-T-112, and Pacific Northwest Laboratory waste. The tank also received supernatant waste from tank 241-U-110 during the second quarter of 1973. In the third quarter of 1973, tank 241-U-107 received N-Reactor waste, supernatant waste from

tank 241-T-103, and Pacific Northwest Laboratory waste. Supernatant waste was sent to tank 241-C-104 during the first three quarters of 1973. In the fourth quarter of 1973, tank 241-U-107 received N-Reactor waste, supernatant waste from tanks 241-S-106 and 241-S-107, T Plant decontamination waste, flush water, and Pacific Northwest Laboratory waste. During this quarter, supernatant waste was sent to tanks 241-C-104 and 241-S-101.

During 1974, tank 241-U-107 received N Reactor waste, T Plant decontamination waste, and Pacific Northwest Laboratory waste. The tank also received supernatant waste from tank 241-U-110 during the second quarter. Supernatant waste was sent to tanks 241-S-101 and 241-S-110 during the first quarter, to tank 241-S-110 in the second and third quarters, and to tank 241-S-107 in the fourth quarter.

In the first quarter of 1975, tank 241-U-107 received T Plant decontamination waste, laboratory waste from tank 204-4S, Pacific Northwest Laboratory waste, and waste water from tanks 244-UR-001 and 244-TX-002. Also in this quarter, supernatant waste was sent to tank 241-S-107. In the second quarter of 1975, tank 241-U-107 received N Reactor waste, T Plant decontamination waste, Pacific Northwest Laboratory waste, and waste water from tanks 244-UR-002 and 244-TX-002. In the third quarter of 1975, tank 241-U-107 received N Reactor waste, T Plant decontamination waste, laboratory waste from 222-S and 204-4S, and Pacific Northwest Laboratory waste. In the fourth quarter of 1975 and the first quarter of 1976, tank 241-U-107 received T Plant decontamination waste, laboratory waste from the 222-S Laboratory, and Pacific Northwest Laboratory waste. Supernatant waste was sent to tank 241-U-108 during the second, third, and fourth quarters of 1975.

In the first quarter of 1976, tank 241-U-107 received T Plant decontamination waste, Pacific Northwest Laboratory waste, and laboratory waste from the 222-S Laboratory. Waste was set to tank 241-U-108 in this quarter as well. In the second quarter of 1976, tank 241-U-07 received N Reactor waste, T Plant decontamination waste, Pacific Northwest Laboratory waste, laboratory waste from the 222-S Laboratory, and waste water from catch' tank 241-TX-302C. Supernatant waste was sent to tank 241-U-103 in this quarter as well.. Tank 241-U-107 received evaporator feed from tank 241-S-102 during the third quarter of 1976 and sent evaporator feed back to tank 241-S-102 in the fourth quarter of 1976.

In the first quarter of 1977, tank 241-U-107 received waste from tank S-102. In the second and third quarters of 1977, some waste was sent to tank 241-SY-102. In the fourth quarter of 1977, tank 241-U-107 received waste from tank 241-SY-102.

In the first quarter of 1978, tank 241-U-107 received $HNO_3/KMnO_4$ solution via 242-S evaporator and supernatant waste from tank 241-SY-102. In the second quarter of 1978, tank 241-U-107 received more $HNO_3/KMnO_4$ and sent supernatant to tank 241-SY-102. In the third quarter of 1978, tank 241-U-107 received waste from tank 241-SY-102 and sent waste to tanks 241-U-102 and 241-U-111. In the fourth quarter of 1978, tank 241-U-107 received waste from tank 241-SY-102 and sent waste to tank 241-U-111.

During 1979, tank 241-U-107 received waste from tank 241-SY-102. Waste from tank 241-U-107 was sent to tanks 241-SX-101, 241-SX-106, and 241-U-111 during the first quarter of 1979 and to tank 241-U-111 during the second and third quarters of 1979.

In the first quarter of 1980, tank 241-U-107 received waste from tank 241-SY-102, and waste was sent to tank 241-SX-101. In the second quarter of 1980, waste was sent to and received from tank 241-SY-102. In the third quarter of 1980, tank 241-U-107 received $HNO_3/KMnO_4$ and tank 241-SY-102 waste. During this quarter, waste was sent to tanks 241-SY-102 and 241-U-111. In the fourth quarter of 1980, tank 241-U-107 received $HNO_3/KMnO_4$ and 241-SY-102 waste. During this quarter, waste was sent to tank 241-SY-102. Tank 241-U-107 was removed from service in November 1980.

Table 2-3. Summary of Tank 241-U-107 Waste Input History.[1,2] (2 sheets)

Transfer Source	Waste Type Received	Time	Estimated Volume	
			kL	kgal
T Plant	Metal waste from $BiPO_4$ process	1948 to 1949	6,019	1,590
Miscellaneous	Flush water	1953	693	183
T Plant	Metal waste from $BiPO_4$ process	1954	6,000	1,585
Miscellaneous	Flush water	1955	1,957	517
241-S-107	REDOX coating waste supernate	1957 to 1959, 1968	3,282	867
241-SX-105	Supernate	1969	2,835	749
241-S-107	REDOX coating waste supernate	1969	1,071	283
Miscellaneous	Flush water	1969	220	58
241-T-112	Supernate	1972 to 1973	3,290	869
N-Reactor	Decontamination waste	1972 to 1973	3,502	925
Pacific Northwest Laboratory	Miscellaneous laboratory waste	1972 to 1973	2,517	665
241-T-103, 241-S-106, 241-S-107	Supernate	1973	1,745	461
241-U-110	Supernate	1973 to 1974	1,261	333

Table 2-3. Summary of Tank 241-U-107 Waste Input History.[1,2] (2 sheets)

Transfer Source	Waste Type Received	Time	Estimated Volume	
			kL	kgal
T-Plant	Decontamination waste	1973 to 1974	1,809	478
Miscellaneous	Flush water	1973 to 1974	140	37
N-Reactor	Decontamination waste	1974 to 1975	4,607	1,217
Pacific Northwest Laboratory	Miscellaneous laboratory waste	1974 to 1975	2,956	781
204-S-4	Laboratory waste	1975	201	53
241-TX-002, 244-UR-001, 244-UR-002	Waste water	1975	242	64
Miscellaneous	Flush water	1975	151	40
T-Plant	Decontamination waste	1975 to 1976	2,161	571
222-S	Laboratory waste	1975 to 1976	386	102
N-Reactor	Decontamination waste	1976	57	15
Pacific Northwest Laboratory	Miscellaneous laboratory waste	1976	810	214
241-TX-302C	Waste water	1976	34	9
241-S-102	Evaporator feed	1976 to 1977	1,408	372
241-SY-102	Supernate	1977 to 1978	3,838	1,014
Caustic additions	$HNO_3/KMnO_4$	1978	132	35
241-SY-102	Supernate	1979 to 1980	11,330	2,993
Caustic additions	$HNO_3/KMnO_4$	1980	257	68

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 estimate of tank 241-U-107 contents (see Table 2-4) is based on historical transfer data. The estimates should be used with caution. The historical data used for estimates are from the *Waste Status and Transaction Record Summary for the Northeast 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 Hanford Defined Waste (HDW) list, the Tank Layer Model (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. The SMM derives concentrations and volumes for supernatant and evaporator concentrate wastes. 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-U-107 contains a layer of 1,079 kL (285 kgal) of SMMS2 waste, a layer of 53 kL (14 kgal) of SMMT2 waste, and a bottom layer of 290 kL (76 kgal) of Type I REDOX coating waste (CWR1). Figure 2-3 is a graphical representation of the estimated waste types and volumes for these layers. The SMMS2 layer, analogous to the S2 salt slurry, should contain large amounts of nitrate, sodium, hydroxide, and nitrite. Additionally, smaller amounts of aluminum, fluoride, chloride, phosphate, sulfate, and carbonate should be present. The SMMT2 layer may not be distinguishable at this level of analytical resolution. The CWR1 layer should contain large amounts of sodium, aluminum, and hydroxide. Additionally, smaller amounts of nitrate, nitrite, lead, iron, calcium, and carbonate should be present.

Figure 2-3. Tank Layer Model for Tank 241-U-107.

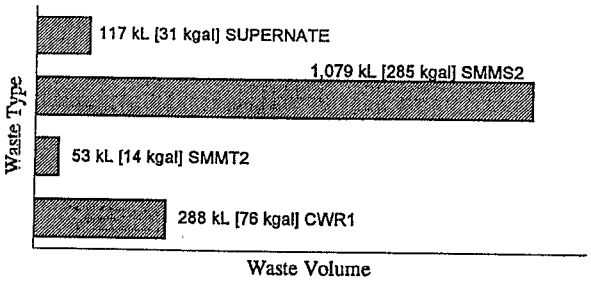


Table 2-4. Tank 241-U-107 Historical Inventory Estimate.[1,2] (2 Sheets)

Total Inventory Estimate			
Physical Properties			
Total waste	2.45E+06 kg (406 kgal)		
Heat load	2,520 W (8,600 Btu/hr)		
Bulk density	1.59 (g/mL)		
Water wt%	34.4		
TOC wt% carbon (wet)	0.683		
Chemical Constituents	**M**	**ppm**	**kg**
Na^{+}	11.1	1.60E+05	3.91E+05
Al^{3+}	3.38	57,300	1.40E+05
Fe^{3+} (total Fe)	0.0371	1,300	3,190
Cr^{3+}	0.0482	1,570	3,850
Bi^{3+}	0.00115	150	368
La^{3+}	3.79E-05	3.30	8.09
Hg^{2+}	7.71E-04	97.0	238
Zr (as $ZrO(OH)_2$)	7.92E-04	45.3	111
Pb^{2+}	0.0228	2,970	7,270
Ni^{2+}	0.00556	205	501
Sr^{2+}	1.26E-05	0.695	1.70
Mn^{4+}	0.00324	112	273
Ca^{2+}	0.0511	1,280	3,140
K^{+}	0.0464	1,140	2,790
OH^{-}	13.4	1.44E+05	3.50E+05
NO_3^{-}	4.42	1.72E+05	4.22E+05
NO_2^{-}	2.1	60,600	1.48E+05
CO_3^{2-}	0.389	14,700	35,900
PO_4^{3-}	0.0769	4,590	11,200

Table 2-4. Tank 241-U-107 Historical Inventory Estimate.[1,2] (2 Sheets)

Total Inventory Estimate			
Chemical Constituents	M	ppm	kg[3]
SO_4^{2-}	0.204	12,300	30,000
Si (as SiO_3^{2-})	0.0691	1,220	2,980
F^-	0.0646	770	1,890
Cl^-	0.171	3,810	9,340
$citrate^{3-}$	0.0237	2,810	6,880
$EDTA^{4-}$	0.0134	2,430	5,940
$HEDTA^{3-}$	0.0252	4,330	10,600
$glycolate^-$	0.0775	3,650	8,930
$acetate^-$	0.00529	196	480
$oxalate^{2-}$	3.24E-05	1.79	4.39
DBP	0.0158	2,640	6,460
butanol	0.0158	735	1,800
NH_3	0.0478	510	1,250
$Fe(CN)_6^{4-}$	0	0	0
Radiological Constituents	**Ci/L**	**μCi/g**	**Ci[3]**
Pu	---	0.343	14.0 (kg)
U	0.0445 (M)	6,650 (μg/g)	16,300 (kg)
Cs	0.207	130	3.19E+05
Sr	0.0996	62.5	1.53E+05

Notes:

[1]Agnew et al. (1996a)

[2]These estimates should be used with caution.

[3]Differences appear to exist among the inventory in this column and the inventories calculated from the two sets of concentrations.

2.4 SURVEILLANCE DATA

Tank 241-U-107 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 measurements may indicate if a major leak from a tank exists. Solid surface level measurements provide information about physical changes and consistency of the solid layers. Tank 241-U-107 has one liquid observation well in riser 19 that measures interstitial liquid levels. Drywells around the tank perimeter enable monitoring of increased radiation caused by leaks.

2.4.1 Surface Level

The surface level of the waste is monitored with an ENRAF® surface level gauge through riser 8. The allowable deviations from the tank 241-U-107 baseline of 3.64 m (12.9 ft) are a 7.5 cm (3 in.) increase and a 1.3 cm (0.5 in.) decrease over a two week period. According to the Surveillance Analysis Computer System (SACS) database, the earliest surface level reading for tank 241-U-107 was in January 1981 when the level was recorded as 3.50 m (11.5 ft). On June 23, 1996, the surface level obtained from the SACS database was 3.97 m (13.1 ft). Figure 2-4 shows a representation of the tank volume history.

2.4.2 Drywells

Four drywells have been identified for tank 241-U-107. Drywells 60-07-01 (active prior to 1990, current reading < 200 c/s), 60-07-10 (active prior to 1990, current reading > 200 c/s), and 60-07-11 (active prior to 1990, current reading > 200 c/s) have or had readings greater than the 50 c/s background radiation. Drywell 60-07-02 has not had readings greater than the 50 c/s background radiation. Although increased activity has been observed in some drywells, it is not attributed to a leak from tank 241-U-107.

2.4.3 Internal Tank Temperatures

Tank 241-U-107 has one thermocouple tree in riser 1 with 11 thermocouples to monitor the waste temperature. Elevations are available for all thermocouples. For plots of individual thermocouple readings, refer to Brevick et al. (1994).

The following temperature data were obtained from the SACS database. From July 1987 to the present, the mean temperature was 24.7 °C (76.4 °F) with a minimum of 17 °C (62 °F) and a maximum of 32 °C (89 °F). In 1996, the past year, the mean temperature recorded was 25.2 °C (77.4 °F) with a minimum of 18.5 °C (65.3 °F) and a maximum of 30.4 °C (86.8 °F). On June 23, 1996, the low temperature recorded was 21.5 °C (70.7 °F) from

thermocouple 10; the high temperature recorded was 25.7 °C (78.26 °F) from thermocouples 2 and 4. Thermocouples 2 and 4 were in the waste, and thermocouple 10 was in the tank headspace. Figure 2-5 shows the weekly high temperature.

2.4.4 Tank 241-U-107 Photographs

The July 7, 1988, photographic montage of the interior of tank 241-U-107 (Brevick 1994) shows the waste surface is primarily liquid with a mixture of uniformly dispersed solid material. A turbine pump, inlet nozzles, and a liquid observation are visible in the left of the photograph. A thermocouple tree, a recirculating dip tube, and other nozzles are visible in the background. A Food Instrument Corporation surface level probe contacts the supernate in the foreground. At the time the photograph was taken, the tank contained approximately 1,537 kL (406 kgal) of waste.

Figure 2-4. Tank 241-U-107 Level History.

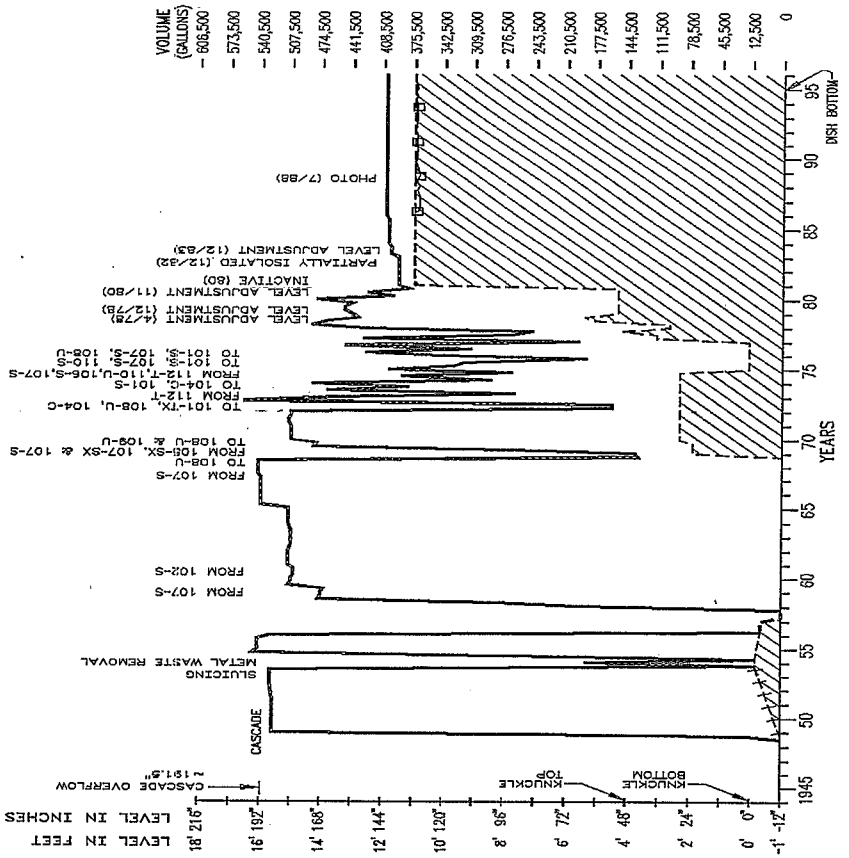
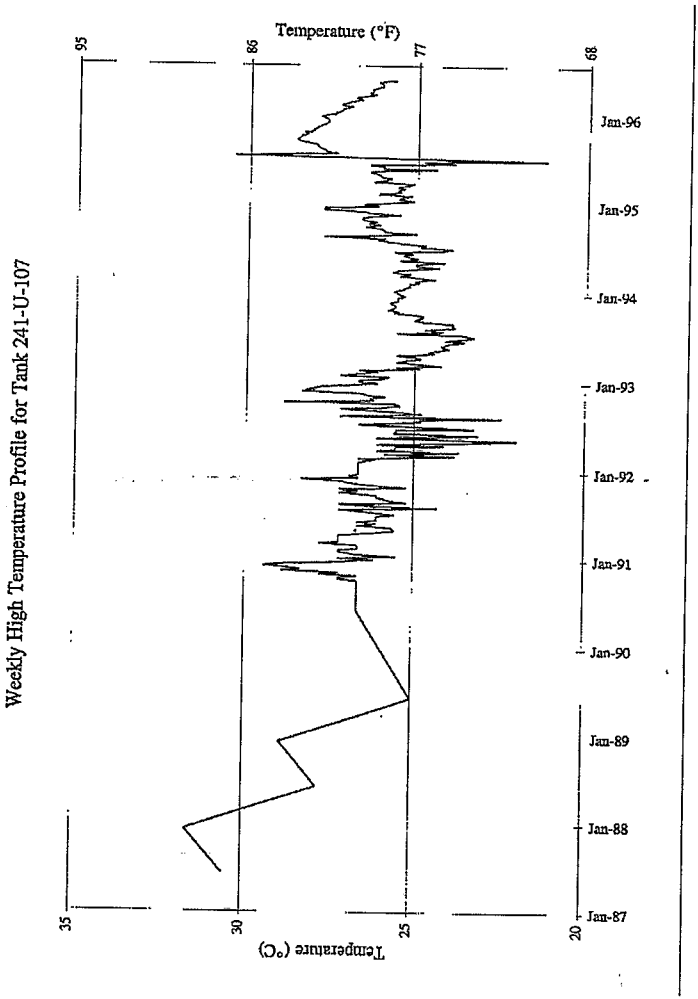


Figure 2-5. Tank 241-U-107 Weekly High Temperature Plot.



3.0 TANK SAMPLING OVERVIEW

This section describes the February through March 1996 and April 1995 sampling and analysis events for tank 241-U-107. Push-mode core samples and grab samples were taken to satisfy the requirements of the tank safety screening DQO (Dukelow et al. 1995), the organic DQO (Turner et al. 1995), and the waste compatibility DQO (Fowler 1995). The sampling and analysis were performed in accordance with the *Tank 241-U-107 Push Mode Sampling and Analysis Plan* (Jo 1996c). For further discussion of the sampling and analysis procedures refer to the *Tank Characterization Reference Guide* (DeLorenzo et al. 1994).

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

3.1 DESCRIPTION OF SAMPLING EVENT

Three push-mode core samples were collected from tank 241-U-107 between February 6 and March 28, 1996. Cores 129, 134, and 135 were obtained from risers 9, 7, and 2, respectively. Eight segments were to be taken for each core. Because hard surfaces were encountered at different levels for each core, the cores were three, six and two segments in length, respectively. A water solution, spiked with a lithium bromide tracer, was used to soften the sample when hard surfaces were encountered. The surfaces did not soften on contact with the wash water; therefore, sample recovery was limited.

Three liquid grab samples were collected on April 11, 1995 from riser 7: sample U-107-1 was analyzed to support the waste compatibility DQO, and the samples U-107-2 and U-107-3 were archived for possible future analysis (Esch 1995).

The flammable gas concentration of the tank headspace was measured according to the requirements of the safety screening DQO. The tank headspace was sampled periodically through risers 7 and 9 from February 6 through February 21, 1996. Results for total organic vapor, oxygen, ammonia, and the LFL of the flammable gases were obtained.

All analyses were performed by the Westinghouse Hanford Company 222-S Laboratory in accordance with the referenced SAP (Jo 1996c).

Table 3-1. Integrated Data Quality Objective Requirements for Tank 241-U-107.[1]

Sampling Event	Applicable DQOs	Sampling Requirements	Analytical Requirements
February and March 1996 core sampling	Safety screening (Dukelow et al. 1995)	Vertical profiles from two widely spaced risers	► Energetics ► Moisture content ► Total alpha activity ► Density ► TOC ► Anions by IC ► Metals by ICP ► Visual check for organic layer (liquid samples only) ► Flammable gas
	Organic (Turner et al. 1995)		► Energetics ► Moisture content ► TIC, TOC ► Metals by ICP
February and March 1996 core sampling April 1995 grab sampling	Waste compatibility (Fowler 1995) (liquid samples only)	Not specified	► Energetics ► Moisture content ► Specific gravity ► TIC, TOC ► Metals by ICP ► Anions by IC ► Radionuclides ► Hydroxide ► Ph ► Percent solids ► Visual check for organic layer

Note:
[1]Jo (1996c)

3.2 SAMPLE HANDLING

All three core samples were received by the Westinghouse Hanford Company 222-S Laboratory between February 9 and April 2, 1996. Each sample was extruded between February 13 and April 16, 1996, and analyzed in accordance with the SAP (Jo 1996c). Core 129 was subsampled into half segments, and cores 134 and 135 were subsampled into segments, half segments, and quarter segments. Drainable liquid (DL) was found in all three core samples and liner liquid (LL) was recovered from cores 134 and 135.

Table 3-2 describes the subsampling scheme, mass, drill string dose rate, and visual characteristics.

Table 3-2. Tank 241-U-107 Core Sample Information.[1] (3 sheets)

Riser	Core	Segment	Drill String Dose Rate (mR/hr)	Sub-segment	Recovery	Description
9	129	1	1,500	DL	266.8 mL	Clear light yellow/green.
				Lower ½	3.5 g	Extruded approximately 0.5 in. of crystalline saltcake. Light yellow.
		1R	7	n/a	None	n/a
		2	1,500	DL	225 mL	Dark brown and opaque.
				Upper ½	75.1 g	Extruded approximately 3 in. of solids. Dark brown to black, resembled a wet saltcake.
				Lower ½	37.2 g	
		2R	30	n/a	None	n/a
		3	1,000	Upper ½	194.9 g	Extruded approximately 15 in. of solids. Light brown gray, resembled a wet saltcake.
				Lower ½	179.1 g	
		3R	300	Upper ½	163.2 g	Extruded approximately 7 in. of solids. Medium gray, resembled a crystalline saltcake.
7	134	1	5	n/a	None	n/a
		2	350	Upper ½	249.2 g	Extruded approximately 12 in. of solids. White/gray, resembled a dry saltcake.
		3	400	Upper ½	143.9 g	Extruded approximately 6.5 in. of solids. Medium gray, resembled a saltcake.

Table 3-2. Tank 241-U-107 Core Sample Information.[1] (3 sheets)

Riser	Core	Segment	Drill String Dose Rate (mR/hr)	Sub-segment	Recovery	Description
7 Cont'd	134 Cont'd	4	1,400	Lower ½	184.4 g	Extruded approximately 17.5 in. of solids. Facies present; lower section was black sludge, upper section was dark gray saltcake.
				A	81.8 g	
				B	92.8 g	
		5	800	A	59.8 g	Extruded approximately 5 in. of solids. Gray saltcake (upper section), black sludge (lower section). Facies present.
				B	49.7 g	
		5A	70	A	19.4 g	Extruded approximately 1 in. of solids. Gray with some brown tint, resembled a saltcake.
				LL	32.8 g	
		5B	1,200	DL	70 mL	Dark brown and opaque.
		6	2	n/a	None	n/a
		6A	150	DL	70 mL	Light brown and opaque.
				Whole	29.3 g	Extruded approximately 6 inches of solids. Light brown, resembled a wet saltcake.
				LL	16.8 g	
	U-107-1	Grab samples	4.5	n/a	n/a	No estimate of recovery. No settled solids.
	U-107-2		2			
	U-107-3		3			

Table 3-2. Tank 241-U-107 Core Sample Information.[1] (3 sheets)

Riser	Core	Segment	Drill String Dose Rate (mR/hr)	Sub-segment	Recovery	Description
2	135	1	1,000	Upper ½	1.4 g	Extruded approximately 0.5 in. of solids. Dark brown, resembled a wet sludge.
				DL	50 mL	Dark brown and opaque.
		1R	1,500	Whole	4.0 g	Extruded approximately 0.25 in. of solids. Yellow and a crystalline saltcake.
				DL	250 mL	Yellow and clear.
		2	45	Upper ½	2.6 g	Extruded approximately 0.25 in. of solids. Dark black, resembled a wet saltcake.
				LL	30.1 g	
		2A	800	Whole	58.7 g	Extruded approximately 1 in. of solids. Light brown, resembled a saltcake.
				DL	25 mL	Yellowish brown and opaque.
		2R	300	Upper ½	111.0 g	Extruded approximately 10 in. of solids. Light gray, resembled a saltcake.
				Lower ½	116.6 g	

Notes:

n/a = not applicable

[1]Jo (1996a)

3.3 SAMPLE ANALYSIS

Table 3-1 lists the analyses performed on the core samples that were required by the safety screening, organic, and waste compatibility DQOs. In addition to the core and grab sample analyses, the tank headspace flammability was measured with a combustible gas meter before core sampling. Gamma energy analysis (GEA) was performed on three subsamples to provide radionuclide content information for the disposal of laboratory waste.

Bromide analysis by IC and lithium analysis by ICP were also performed to determine the amount of wash water contamination that occurred in the samples during sampling. Liner liquid recovered from the samples was contaminated with wash water. Anion IC results and ICP data for other elements were also reported as specified in Kristofzski (1995).

Where appropriate, laboratory quality control checks included laboratory control standards, matrix spikes, duplicate analyses, and blanks. Section 5.1.2 assesses the quality control procedures and data.

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

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

Core	Segment	Segment Portion	Labcore Number[2]	Analyses
129	1	Lower ½	0683 0684	DSC, TGA Alpha
		DL	0637 0665	SpG ICP, IC, Alpha, DSC, TGA, TIC, TOC, OH, Sr, pH
	2	Upper ½	0642 0644 0690 0788	Bulk density DSC, TGA, TIC, TOC IC ICP
		Lower ½	0645 0647 0687 0691 0789	Bulk density DSC, TGA, TIC, TOC Alpha IC ICP
		DL	0641 0682 0685 3487	SpG DSC, OH, TGA, Sr, ICP, IC, pH Bulk density TIC, TOC
	3	Upper ½	0648 0650 0692 0790	Bulk density DSC, TGA, TIC, TOC IC ICP
		Lower ½	0651 0653 0689 0693 0791	Bulk density DSC, TGA, TIC, TOC Alpha IC ICP
	3R	Upper ½	1140 1143 1153	Bulk density DSC, TGA, TIC, TOC Alpha
		Whole	1144 1152	IC ICP

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

Core	Segment	Segment Portion	Labcore Number[2]	Analyses
134	2	Upper ½	1043 1055 1089	Bulk density DSC, TGA, TIC, TOC Alpha
		Whole	1071 1080 2284	IC ICP ICP
	3	Upper ½	1044 1056 1090	Bulk density DSC, TGA, TIC, TOC Alpha
		Whole	1072 1081 2285	IC ICP ICP
	4	A	1061 1064 1074 1083 1092	Bulk density DSC, TGA, TIC, TOC IC ICP Alpha
		B	1062 1065 1075 1084 1093	Bulk density DSC, TGA, TIC, TOC IC ICP Alpha
		A	2287	ICP
		B	2288	ICP
		Lower ½	1047 1057 1073 1082 1091 2286	Bulk density DSC, TGA, TIC, TOC IC ICP Alpha ICP

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

Core	Segment	Segment Portion	Labcore Number[2]	Analyses
134 Cont'd	5	A	1067 1068 1077 1086 1095	Bulk density DSC, TGA, TIC, TOC IC ICP Alpha
		B	1058 1066 1076 1085 1094	DSC, TGA, TIC, TOC Bulk density IC ICP Alpha
	5A	LL	1110 2034	OH, Sr, ICP, IC, Alpha DSC, TGA, TIC, TOC, Sr, IC
		A	1045 1059 1096	Bulk density DSC, TGA, TIC, TOC Alpha
		Whole	1078 1087	IC ICP
	5B	DL	1107 1119	SpG DSC, OH, TGA, TIC, TOC, Sr, ICP, IC, pH
	6	LL	1120	DSC, OH, TGA, TIC, TOC, Sr, ICP, IC, Alpha
		Whole	1046 1070 1079 1088 1097	Bulk density DSC, TGA, TIC, TOC IC ICP Alpha
		DL	1121	DSC, OH, SpG, TGA, TIC, TOC, Sr, ICP, IC, Alpha, pH

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

Core	Segment	Segment Portion	Labcore Number[2]	Analyses
135	1	Upper ½	2131 2134	DSC, TGA GEA, Alpha
		DL	2140	DSC, OH, SpG, TGA, TIC, TOC, Sr, ICP, IC, GEA, Alpha, pH
	1R	Whole	2132 2135	DSC, TGA GEA, Alpha
		DL	2141	DSC, OH, SpG, TGA, TIC, TOC, Sr, Pu, ICP, IC, GEA, Alpha, pH
	2	LL	1865 1866	SpG DSC, OH, TGA, TIC, TOC, Sr, ICP, IC, Alpha
		Upper ½	1867 1868	DSC, TGA Alpha
	2A	Whole	2130 2133 2136 2160 2161	Bulk density DSC, TGA GEA, alpha IC ICP
		DL	2142	DSC, OH, SpG, TGA, TIC, TOC, Sr, Pu, ICP, IC, GEA, Alpha, pH
	2R	A	1875 1877	IC ICP
		B	1876 1878	IC ICP
		Upper ½	1869 1873 1879	Bulk density DSC, TGA, TIC, TOC Alpha
		Lower ½	1870 1874 1880	Bulk density DSC, TGA, TIC, TOC Alpha
n/a	U-107-1 (Grab)	DL	0792	SpG, pH, Cs, Am, DSC, OH, TGA, TIC, TOC, Sr, Pu, ICP, IC

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

Core	Segment	Segment Portion	Labcore Number[2]	Analyses
n/a	Vapor tests	Tank headspace	n/a	Combustible gas meter readings for: flammable gas concentration, oxygen, total organic vapors, ammonia

Notes:

n/a = not applicable

[1]Jo (1996a)

[2]Labcore numbers begin with S96T00 for the core samples and S95T00 for the grab sample.

Table 3-4. Analytical Procedures.[1]

Analysis	Instrument	Preparation Procedure	Analytical Procedure
Energetics by DSC	Mettler[1] Perkin-Elmer[2]	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	LA-549-141, Rev. D-0	LA-508-101, Rev. D-2
Total Carbon	n/a	n/a	LA-342-100, Rev. C-0
Solid bulk density	n/a	n/a	LO-160-103, Rev. A-7
Liquid specific gravity	n/a	n/a	LA-510-112, Rev. C-3
Lithium and other metals by ICP	Inductively coupled plasma spectrometer	LA-505-159, Rev. C-0	LA-505-151, Rev. D-3 LA-505-161, Rev. B-0
Bromide and other anions by IC	Ion chromatograph	LA-504-101, Rev. D-0	LA-533-105, Rev. D-1

[1]Mettler is a trademark of Mettler Electronics, Anaheim, California.

[2]Perkin Elmer is a trademark of Perkins Research and Manufacturing Company, Inc., Canoga Park, California.

Table 3-4. Analytical Procedures.[1]

Analysis	Instrument	Preparation Procedure	Analytical Procedure
Radionuclides by GEA	Gamma detector spectrometer	LA-549-141, Rev. D-0	LA-548-121, Rev. D-1
pH	n/a	n/a	LA-212-106, Rev. A-0
Flammable gas oxygen	Combustible gas meter readings	n/a	WHC-IP-0030-IH1.4
Total organic vapor ammonia	Organic vapor meter	n/a	WHC-IP-0030-IH2.1

Note:

[1]Jo (1996a and 1996b)

3.4 DESCRIPTION OF PREVIOUS SAMPLING EVENTS

This section discusses three previous sampling and analysis events. Two samples to characterize tank waste were reported in Wheeler (1974) and Horton (1975a and 1975b). Because of multiple waste transfers after these sampling events, the results no longer represent the tank contents. However, the current conditions in the tank headspace were determined by a vapor sampling event reported by Huckaby and Bratzel (1995). Appendix C shows the previous sampling event analytical results for the events reported by Wheeler and Horton.

3.4.1 Sample Handling and Analysis (1974)

Sample T-8938 was received on October 14, 1974 and reported on December 20, 1974. It was described as a clear yellow liquid. No description or information was available about the procedure used to obtain the sample or about the sample riser or sample depth.

3.4.2 Sample Handling and Analysis (1975)

A sample was received on December 9, 1974 and reported on January 20, 1975. The sample was described as reddish-brown in color. No description or information was available about the procedure used to obtain the sample or about the sample riser or sample depth. Sludge analyses were made by fusing samples with KOH, dissolving the melt in HCl, and diluting with water.

3.4.3 Description of the Vapor Sampling Event (1995)

The tank headspace was vapor sampled in accordance with *Data Quality Objectives for Generic In-Tank Health and Safety Issue Resolution* (Osborne et al. 1994). This DQO directed the collection and analysis of headspace vapor samples to help determine the potential risks of fugitive emissions to tank farm workers. The results are reported in *Tank 241-U-107 Headspace Gas and Vapor Characterization Results for Samples Collected in February 1995* (Huckaby and Bratzel 1995). Section 4.2 summarizes the results.

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4.0 ANALYTICAL RESULTS

This section summarizes the analytical results associated with the February and March 1996 core sampling and the 1995 grab sampling events of tank 241-U-107. The SAP (Jo 1996c) integrates all documents related to sampling and analytical requirements including applicable DQOs. All analyses were performed at the Westinghouse Hanford Company 222-S Laboratory.

Table 4-1 shows the locations of the analytical results. Appendix A gives comprehensive analytical data; Section 4.0 reports overall analyte means only. Appendix B contains data for lithium and bromide, the analytes that were evaluated to gauge the amount of contamination by the wash water used during sampling.

Table 4-1. Analytical Data Presentation Tables.

Data Type	Tabulated Location
Chemical data summary	Table 4-2
DSC exothermic data summary	Table 4-3
1995 inorganic vapor sampling results	Table 4-4
1995 organic vapor sampling results	Table 4-5
Comprehensive analytical data	Appendix A
Wash water contamination check data	Appendix B
Historical sampling data	Appendix C

4.1 DATA PRESENTATION

This section summarizes the analytical results associated with the February and March 1996 core sampling and the 1995 grab sampling events of tank 241-U-107. The following subsections provide information about the chemical, physical, vapor, and wash water contamination check data. The data were originally reported in the *45-Day Safety Screening Results for Tank 241-U-107, Push Mode Cores 129, 134, and 135* (Jo 1996a), *Final Report for Tank 241-U-107, Push Mode Cores 129, 134, and 135* (Jo 1996b), and *Waste Compatibility Safety Issue Results Tank 241-U-107-1, U-107-2, and U-107-3* (Esch 1995).

4.1.1 Chemical Data Summary

Table 4-2 shows the mean concentration estimates and inventories for the solid and liquid results separately and a total tank inventory based on both waste phases. Data from the three cores were combined to derive the overall concentration means for all analytes. The overall means are weighted means and were calculated by averaging the individual primary and duplicate results for each subsegment to obtain a subsegment mean. The subsegment means within a given segment were averaged to obtain a segment mean, then the segment means for an individual core were averaged to derive a core mean. Finally, the three core means were averaged to obtain the overall mean. Not all steps are necessary for each analyte or 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. If nondetected results are used as quantitative values, the mean concentrations and inventory estimates are biased. The magnitude of the bias cannot be estimated.

Columns 2 and 5 give the overall means for the liquid and solid portions of the waste, respectively. Appendix A lists original subsegment analytical data.

Relative standard deviations of the mean (RSD), 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). Columns 3 and 6 show the means for liquids and solids, respectively; they were calculated only for analytes that had 50 percent or more of their individual primary/duplicate results above the detection limit. Using nondetected results in the mean calculation requires their use in the RSD (mean) calculations. If nondetected results are used as quantitative values, the RSD are biased. The magnitude of the bias cannot be estimated. Therefore, the RSD (mean) estimates and the ANOVA results in which nondetected data were used should be used with caution.

Column 4, the liquid inventory, was calculated by multiplying the overall mean by the supernate waste volume (117 kL [31 kgal]) and dividing by a unit conversion factor of 1E+06. Column 7, the solid inventory, was calculated by multiplying the overall mean by the solid density (1.52 g/mL) and the solid waste volume (1,420 kL [375 kgal]) and dividing by a unit conversion factor of 1E+06. Column 8 lists the total inventory results, the sum of liquid and solid inventories. Because samples from all segments were not collected, the total inventory results should be used with caution.

Table 4-2. Chemical Data Summary for Tank 241-U-107. (4 sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solid Concentration	Solid RSD (Mean)	Solid Inventory	Total Inventory
METALS	µg/mL	%	kg	µg/g	%	kg	kg
Aluminum	23,100	3.5	2,700	7,620	26.8	16,400	19,100
Antimony	< 44.1	n/a	< 5.16	< 33.6	n/a	< 75.5	< 80.7
Arsenic	< 73.4	n/a	< 8.59	< 55.3	n/a	< 119	< 128
Barium	< 36.7	n/a	< 4.29	< 27.7	n/a	< 59.8	< 64.1
Beryllium	< 3.67	n/a	< 0.429	< 2.77	n/a	< 5.98	< 6.41
Bismuth	< 73.4	n/a	< 8.59	< 64.9	n/a	< 140	< 149
Boron	70.4	5.7	8.24	89.1	17.6	192	200
Cadmium	< 3.67	n/a	< 0.429	< 4.49	n/a	< 9.69	< 10.1
Calcium	95.9	7.8	11.2	298	17.4	643	654
Cerium	< 73.4	n/a	< 8.59	< 55.3	n/a	< 119	< 128
Chromium	567	35.3	66.3	2,410	36.9	5,200	5,270
Cobalt	< 14.7	n/a	< 1.72	< 11.1	n/a	< 24.0	< 25.7
Copper	< 7.34	n/a	< 0.859	< 8.05	n/a	< 17.4	< 18.3
Iron	< 35.1	n/a	< 4.11	799	51.1	1,720	1,720
Lanthanum	< 36.7	n/a	< 4.29	< 27.7	n/a	< 59.8	< 66.3
Lead	< 73.4	n/a	< 8.59	< 94.4	n/a	< 204	< 213
Magnesium	< 73.4	n/a	< 8.59	< 77.0	n/a	< 166	< 175
Manganese	< 7.34	n/a	< 0.859	323	54.2	697	698

Table 4-2. Chemical Data Summary for Tank 241-U-107. (4 sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solid Concentration	Solid RSD (Mean)	Solid Inventory	Total[a] Inventory
METALS (Cont.)	µg/mL	%	kg	µg/g	%	kg	kg
Molybdenum	91.6	4.6	10.7	< 30.5	n/a	< 65.8	< 76.5
Neodymium	< 73.4	n/a	< 8.59	< 55.3	n/a	< 119	< 128
Nickel	17.4	12.1	2.04	26.8	29.7	57.8	59.8
Phosphorous	1,130	3.7	132	2,720	53.1	5,870	6,000
Potassium	3,150	7.6	369	819	16.5	1,770	2,140
Samarium	< 73.4	n/a	< 8.59	< 55.3	n/a	< 119	< 128
Selenium	< 73.4	n/a	< 8.59	< 73.9	n/a	< 160	< 169
Silicon	164	23.4	19.2	198	10.4	427	446
Silver	14.1	14.4	1.65	14.7	6.3	31.7	33.4
Sodium	2.19E+05	1.8	25,600	2.01E+05	4.1	4.34E+05	4.60E+05
Strontium	< 7.34	n/a	< 0.859	< 5.96	n/a	< 12.9	< 13.8
Sulfur	2,110	14.8	247	721	23.5	1,560	1,810
Thallium	< 147	n/a	< 17.2	< 111	n/a	< 240	< 257
Titanium	< 7.34	n/a	< 0.859	< 6.07	n/a	< 13.1	< 14.0
Uranium	< 367	n/a	< 42.9	< 299	n/a	< 645	< 688
Vanadium	< 36.7	n/a	< 4.29	< 27.7	n/a	< 59.8	< 64.1
Zinc	17.2	13.1	2.01	29.2	29.4	63.0	65.0
Zirconium	< 7.34	n/a	< 0.859	< 7.61	n/a	< 16.4	< 17.3

Table 4-2. Chemical Data Summary for Tank 241-U-107. (4 sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solid Concentration	Solid RSD (Mean)	Solid Inventory	Total[2] Inventory
ANIONS	µg/mL	%	kg	µg/g	%	kg	kg
Chloride	7,900	4.3	924	2,320	19.0	5,010	5,930
Fluoride	< 229	n/a	< 26.8	< 262	n/a	< 566	< 591
Hydroxide	26,600	2.9	3,110	---	---	---	3,110
Nitrate	2.38E+05	14.0	27,800	4.81E+05	12.4	1.04E+06	1.07E+06
Nitrite	96,200	4.3	11,300	25,100	18.6	54,200	65,500
Oxalate	1,070	47.3	125	3,120	28.5	6,730	6,860
Phosphate	3,830	15.8	448	12,300	39.5	26,500	26,900
Sulfate	6,390	13.4	748	4,490	27.5	9,690	10,400
RADIONUCLIDES	µCi/mL	%	Ci	µCi/g	%	Ci	Ci
Total alpha	< 0.0108	n/a	< 1.26	0.102	38.6	220	221
^{241}Am	< 0.680	n/a	< 79.6[1]	< 0.592	n/a	< 1,280[1]	< 1,360
^{137}Cs	338	19.0	39,500[1]	76.8	19.4	1.66E+05[1]	2.06E+05
^{60}Co	< 0.0196	n/a	< 2.29[1]	< 0.0182	n/a	< 39.3[1]	< 41.6
^{154}Eu	< 0.0768	n/a	< 9.0[1]	< 0.0677	n/a	< 146[1]	< 155
^{155}Eu	< 0.708	n/a	< 82.9	< 0.227	n/a	< 490[1]	< 573
$^{239/240}Pu$	4.78E-05	8.9	0.00559[1]	---	---	---	0.00590
$^{89/90}Sr$	0.413	26.5	48.3	---	---	---	53.9

Table 4-2. Chemical Data Summary for Tank 241-U-107. (4 sheets)

Analyte	Mean Liquid Concentration	Liquid RSD (Mean)	Liquid Inventory	Mean Solid Concentration	Solid RSD (Mean)	Solid Inventory	Total[2] Inventory
Total Carbon	μg C/mL	%	kg	μg C/g	%	kg	kg
Total organic carbon	4,070	7.9	476	2,070	30.5	4,470	4,950
Total inorganic carbon	5,400	12.1	632	2,750	28.7	5,940	6,570
PHYSICAL PROPERTIES	Mean Liquid Value	Liquid RSD (Mean)	Liquid Inventory	Mean Solid Value	Solid RSD (Mean)	Solid Inventory	Total Inventory
Water	49.6 %	1.6	83,000 kg	22.7%	16.3	4.90E+05 kg	5.73E+05 kg
pH	13.4	2.0	n/a	---	---	---	---
Density	1.43 g/mL	1.5	n/a	1.52 g/mL	4.1	---	---

Notes:

n/a = not applicable

--- = no data

[1]Only samples from core 135 were analyzed.

[2]The total inventory should be used with caution. Because all the segments were not obtained for this sampling event.

4.1.2 Physical Data Summary

Thermal analyses were performed on the tank 241-U-107 samples to satisfy the requirements of the safety screening DQO (Dukelow et al. 1995), waste compatibility DQO (Fowler 1995), and organic DQO (Turner et al. 1995), which required that TGA and DSC be performed. Density and pH determinations also required and performed.

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 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 caused by 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™).

Table A-55 shows the TGA percent water data for tank 241-U-107. The overall mean percent water for solids was 22.7 weight percent, and the overall mean for liquids was 49.6 weight percent.

4.1.2.2 Differential Scanning Calorimetry. In a DSC analysis, heat absorbed or emitted by a substance is measured while the temperature of the substance is increased at a constant rate. 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 determined graphically. Analyses by DSC were performed by the 222-S Laboratory using procedure LA-514-113, Rev. C-1 (Mettler™) or LA-514-114, Rev. C-1 (Perkin-Elmer™).

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

To compare the exothermic enthalpy changes to the safety screening and waste compatibility decision limit of -480 J/g, the exothermic values were converted to a dry weight basis using the respective sample weight percent waters. After converting to a dry weight basis, it was determined that 2 of the 13 samples exhibited enthalpy changes exceeding the -480 J/g limit.

For the 13 samples with exothermic DSC results, the upper limits to one-sided 95 percent confidence intervals on the mean were calculated. The upper limits ranged from -16.6 to -678 J/g (dry weight basis) (Jo 1996a).

Table 4-3 shows the 13 samples which had exothermic reactions, the weight percent water for conversion to a dry weight, the converted exothermic value, and the 95 percent confidence interval on the mean upper limits.

4.1.2.3 Density. Bulk density measurements were performed on solid samples using procedure LO-160-103, Rev. A-7. Specific gravity measurements were performed on the liquid samples using procedure LA-510-112, Rev. C-3. The mean density of the solids was 1.52 g/mL; the mean density of the liquid was 1.43 g/mL. Table A-58 shows the analytical data.

4.1.2.4 pH Measurements. Measurements for pH were performed on the liquid samples using procedure LA-212-106, Rev. A-0. The overall pH was 13.4. The pH results should be considered estimates, because the results exceeded the calibration range of the instrument and instrument performance degrades at high pH. The analysis was performed in duplicate. Table A-57 shows the results.

4.1.2.5 Visual Check for an Organic Layer. A visual check for an organic layer was made in accordance with the safety screening and organic DQOs. No organic layer was noted in the sample description record.

4.1.3 Tank Headspace Flammability

As discussed in Section 3.1, the tank 241-U-107 headspace was sampled before the 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 reports results as a percent of the lower explosive limit (LEL). Because the National Fire Protection Association (NFPA) defines the terms LFL and LEL identically, the two terms are used interchangeably (NFPA 1995). Headspace sampling was done through risers 7 and 9 between February 6 and February 21, 1996. The maximum value recorded was 4 percent of the LEL, which indicates no flammability concerns. Furthermore, standard hydrogen monitoring system shows hydrogen concentration of zero ppm between February 25, 1996 to April 1, 1996 (Brown 1996). During the flammable gas monitoring, the maximum concentrations of oxygen (21.1 percent), total organic vapors (75 ppm), and ammonia (600 ppm) also were measured (Jo 1996b).

Table 4-3. DSC Exothermic Results and 95 Percent Confidence Interval Upper Limits.[1] (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Run	Wet Wt. Δ H J/g	Sample Wt% Water %	Dry Wt. Δ H J/g	Mean J/g	95% Confidence Interval on the Mean Upper Limits J/g
Solids								
S96T000683	129:1	Lower ½	1	-12.4[2]	18.95	-15.3	-14.7	-18.5
			2	-11.41		-14.1		
S96T000644	129:2	Upper ½	1	-141.2	47.95	-271.3	-262.6	-317.8
			2	-132.1		-253.8		
S96T000647		Lower ½	1	-9.6[2]	19.68	-12.0	-11.1	-16.6
			2	-8.2[2]		-10.2		
S96T000650	129:3	Upper ½	1	-25.5	24.52	-33.8	-24.0	-85.9
			2	-10.7		-14.2		
S96T000653		Lower ½	1	-13.9	17.11	-16.8	-26.5	-87.7
			2	-30.0		-36.2		
S6T001057	134:4	Lower ½	1	-147.0	36.88	-232.9	-233.7	-238.8
			2	-148.0		-234.5		
S96T001058	134:5	B	1	-11.5[2]	36.51	-18.1	-60.9	-156.8
			2	-79.7		-125.5		
			3	-24.9		-39.2		
S96T001867	135:2	Upper ½	1	-140.6	49.82	-280.2	-244.9	-467.8
			2	-105.2		-209.6		

Table 4-3. DSC Exothermic Results and 95 Percent Confidence Interval Upper Limits.[1] (2 sheets)

Sample Number	Core: Segment	Sub-Segment	Run	Wet Wt. Δ H J/g	Sample Wt% Water %	Dry Wt. Δ H J/g	Mean J/g	95% Confidence Interval on the Mean Upper Limits J/g
Liquids								
S96T000665	129:1	DL	1	-29.2/-25.6[2]	53.22	-58.6	-58.0	-61.8
			2	23.2/-30.5[2]		-57.4		
S96T000682	129:2	DL	1	-40.1/-25.2[2]	49.67	-64.9	-64.1	-69.2
			2	-36.5/-27.2		-63.3		
S96T002140	135:1	DL	1	-256.4	52.50	-539.8	-558.7	-677.7
			2	-274.3		-577.5		
S96T002141	135:1R	DL	1	-296.2	47.03	-559.2	-537.6	-674.0
			2	-273.3		-516.0		
S95T000792	U-107-1	GRAB	1	-74.4	51.39	-153.1	-155.8	-172.5
			2	-77.0		-158.4		

Notes:

[1]Jo (1996a)

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

4.1.4 Wash Water Contamination Check

Because of the hard and compact nature of certain areas of the waste, wash water was used in an attempt to soften the solids during core sampling. Lithium bromide was added to the wash water so that the amount of wash water contamination of the samples could be estimated. This check, through chemical analyses for lithium and bromide, was prescribed by the SAP (Jo 1996c). The wash water did not soften the waste. The analytical results indicated a small amount of Li Br contamination was present in core 134, segment 5B and core 135, segment 2A. Because of the Li Br contamination, the TGA results for the two samples were recalculated. The adjusted TGA results for core 134, segment 5B and core 135, segment 2A was 45.55 and 48.06 weight percent water, respectively. However, sample results for core 134, segment 6A were not included in any mean calculations and should not be considered reliable because of the presence of large amounts of lithium bromide. Appendix B shows the analytical data for lithium and bromide. An overall mean and tank inventory were not calculated for these two analytes because they are not constituents of the tank waste.

4.1.5 Opportunistic Analysis

Due to fluctuations in sampling schedule, the 222-S laboratory often operates at less than maximum capacity. Therefore, additional analytes were requested during the wash water contamination checks. The additional analytes requested were cations and anions.

4.2 DATA SUMMARY OF 1995 VAPOR SAMPLING

The headspace of tank 241-U-107 was sampled on February 17, 1995 by Westinghouse Hanford Company Sampling and Mobile Laboratories. Sampling media were prepared and analyzed by the Westinghouse Hanford Company, Oak Ridge National Laboratory (ORNL), and Pacific Northwest Laboratory.

Inorganic gases and vapors were sampled by a sorbent trap and a SUMMA[3] canister tank; they were analyzed by the Pacific Northwest Laboratory. Organic vapors were sampled using SUMMA™ canisters analyzed by PNNL and sorbent traps analyzed by the Oak Ridge National Laboratory. For results of the sampling, refer to Huckaby and Bratzel (1995). Tables 4-4 and 4-5 are a summary of the inorganic and organic vapor results.

[3]SUMMA is a trademark of Molectrics, Inc., Cleveland, Ohio.

Table 4-4. Summary of Inorganic Species Found in the Headspace of Tank 241-U-107.[1]

Species	Chemical Astract Service Number	Pacific Northwest Laboratory	
		Mean	Standard deviation
		ppmv	ppmv
Ammonia	7664-41-7	453	20
Carbon Dioxide	124-38-9	< 64	---
Carbon Monoxide	630-08-0	< 12	---
Hydrogen	1333-74-0	500	4.6
Nitric Oxide	10102-43-9	≤ 0.06	---
Nitrogen Dioxide	10102-44-0	≤ 0.03	---
Nitrous Oxide	10024-97-2	701	2.5
Water Vapor	7732-18-5	15,800	200

Notes:
[1]Huckaby and Bratzel (1995)

Table 4-5. Summary of Organic Species Found in the Headspace of Tank 241-U-107.[1] (2 sheets)

Species	Chemical Abstract Service Number	Pacific Northwest Laboratory		Oak Ridge National Laboratory	
		Mean[2]	STD[3]	Mean[2]	STD
		ppmv	ppmv	ppmv	ppmv
Propanone (acetone)	67-64-1	0.28	0.02	0.0080	4.0E-04
Trichlorofluoromethane	75-69-4	0.39	0.03	---	---
Propanenitrile[4]	107-12-0	0.062	---	0.0036	3.0E-04
1-Propanol	71-23-8	0.050	0.012	---	---
2-Butanone[5]	78-93-3	0.024	< 0.0015	---	---
Tetrahydrofuran	109-99-9	0.029	0.002	---	---
Benzene	71-43-2	0.032	0.002	0.0029	0.0047
Cyclohexane	110-82-7	0.084	0.005	---	---
Pyridine	110-86-1	0.038	0.032	---	---
Toluene	108-88-3	0.046	0.004	0.032	0.002
p-Xylene m-Xylene[4,6]	106-42-3 108-38-3	0.018	< 0.005	---	---
Methane	74-82-8	< 12	---	---	---
Ethanenitrile (acetonitrile)	75-05-8	---	---	0.12	0.01
n-Dodecane	112-40-3	---	---	0.0041	2.0E-04
n-Tridecane	629-50-5	---	---	0.010	2.0E-04
Dichloromethane (methylene chloride)	75-09-2	---	---	0.0032	0.0029
n-Hexane	110-54-3	---	---	0.0077	0.0023
n-Butanenitrile	109-74-0	---	---	0.0062	9.0E-04
n-Heptane	142-82-5	---	---	0.0030	2.0E-04
n-Pentanenitrile	110-59-8	---	---	3.8E-04	5.0E-05
2-Hexanone	591-78-6	---	---	6.2E-04	1.2E-04
n-Octane	111-65-9	---	---	0.0024	2.0E-04
2-Heptanone	110-43-0	---	---	7.1E-04	9.0E-05

Table 4-5. Summary of Organic Species Found in the Headspace of Tank 241-U-107.[1] (2 sheets)

Species	Chemical Abstract Service Number	Pacific Northwest Laboratory		Oak Ridge National Laboratory	
		Mean[2]	STD[3]	Mean[4]	STD
		ppmv	ppmv	ppmv	ppmv
n-Nonane	111-84-2	---	---	0.0022	2.0E-04
2-Octanone	111-13-7	---	---	4.6E-04	5.0E-05
n-Decane	124-18-5	---	---	0.0030	4.0E-04
n-Undecane	1120-21-4	---	---	0.0025	3.0E-04

Notes:

[1]Huckaby and Bratzel (1995)

[2]Mean of three samples.

[3]When the analyte was detected in only two samples, the entry was relative difference (difference divided by two).

[4]Detected in one sample from the Pacific Northwest Laboratory.

[5]Detected in two samples.

[6]The reported value is total Xylene.

5.0 INTERPRETATION OF CHARACTERIZATION RESULTS

This section discusses the overall quality and consistency of the current sampling results for tank 241-U-107, and it assesses and compares 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 data interpretation. These factors are used to assess the overall data quality and consistency and to identify limitations in data use.

5.1.1 Field Observations

The safety screening DQO (Dukelow et al. 1995) requirement, to sample at least two widely spaced risers, was fulfilled, thereby enabling a horizontal comparison of the analytical results. Core sampling was hindered by very compact and hard areas of the waste resulting in core recoveries that were much less than expected. Although 8 segments per core were expected, core samples were only 2, 3, and 6 segments in length. In an attempt to extract complete profiles, a wash water solution with a lithium bromide tracer was used to help soften the waste. However, this activity did not succeed, and it resulted in the contamination of several core segments.

5.1.2 Quality Control Assessment

The quality control assessment usually evaluates the appropriate standard recoveries, matrix spike recoveries, duplicate analyses, and blanks that are performed in conjunction with the chemical analyses. All pertinent quality control tests were conducted on the samples, enabling a full assessment of data accuracy and precision. The specific criteria for all quality control checks were given in the SAP (Jo 1996c). Appendix A tables identifies quality control results outside these criteria by superscripts.

The standard and matrix spike recovery results provide an estimate of analysis accuracy. If a standard or spike recovery is above or below a given criterion, then the analytical results may be biased. 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 100.

Thirteen standards, six spikes and nine RPDs were outside the SAP-specified limits for total alpha activity. The quality control violations are attributable to low sample activities and high dissolved solids content. Several DSC and TGA sample and duplicate pairs exceeded the RPD criteria, and two TOC sample and duplicate pairs with high RPDs were rerun with acceptable results. There were several analytes by IC and ICP which had spikes, standards, and RPDs outside the defined limits.

Finally, no sample exceeded the criterion for preparation blanks; therefore, laboratory contamination was not a problem for the analyses. In summary, most quality control results were within the boundaries specified in the SAP. Although a few results were outside the target levels, they did not substantially impact data validity or use. The results were far below the action level, thus, violation of QC will have little impact on the validity of the data. Because of incomplete sampling, the results are applicable to portions of the tank where samples were extracted.

5.1.3 Data Consistency Checks

Comparing different analytical methods can be helpful in assessing data consistency and quality. The quantity of data from the core sampling event made it possible to calculate the mass and charge balances and to compare the ICP phosphorus 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 analytical methods. A good comparison strengthens the credibility of both results, whereas a poor comparison brings the reliability of the data into question. All analytical mean results are from Table 4-2.

The analytical phosphorus mean by ICP was 2,720 μg/g, which usually represents total phosphorus. This amount of phosphorus converts to 8,340 μg/g of phosphate. The IC phosphate result was 12,300 μg/g, and the RPD between the two numbers is 38 percent. The ICP sulfur value of 721 μg/g, which represents total sulfur, is equivalent to 2,160 μg/g of sulfate. The IC result for sulfate was 4,490 μg/g, with an RPD between the two values of 70 percent. These results contradict expected behavior. Because ICP measures total sulfur and total phosphorus, its result is expected to be larger than or equal to the IC value, which is a measurement of the soluble sulfur and soluble phosphorus. One explanation for the unexpected results is that some metal sulfates and phosphates are insoluble in acid and more soluble in basic media. At low concentrations, the low sulfur results by ICP may be unreliable.

5.1.3.2 Mass and Charge Balances. The primary objective in performing mass and charge balances is to determine whether the measurements are consistent. In calculating the balances, the only analytes considered in Table 4-2 were those detected at a concentration of 2,000 μg/g or greater.

Except for 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. Phosphorus 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 and the overall uncertainty given in Table 5-3 were computed by propagation of error techniques (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.

Mass balance = percent Water + 0.0001 x {Total Analyte Concentration}
= percent Water + 0.0001 x $\{Al(OH)_3 + Cr(OH)_3 + Na^+ + Cl^- + NO_3^- + NO_2^- + CO_3^{2-} + C_2O_4^{2-} + C_2H_3O_2^- + PO_4^{3-} + SO_4^{2-}\}$

The total analyte concentrations calculated from the above equation is 775,000 μg/g (wet weight). The mean weight percent water obtained from thermogravimetric analysis (see Table 4-2) is 22.7 percent, or 227,000 μg/g. The mass balance resulting from adding the percent water to the total analyte concentration is 100 percent (see Table 5-3).

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

Total cations (μeq/g) = $[Na^+]/23.0 = 8{,}740$ μeq/g

Total anions (μeq/g) = $[Cl^-]/35.5 + [CO_3^{2-}]/30.0 + [C_2O_4^{2-}]/44.0 + [C_2H_3O_2^-]/59.0 + [NO_3^-]/62.0 + [NO_2^-]/46.0 + [PO_4^{3-}]/31.7 + [SO_4^{2-}]/48.0\}$
= 9,470 μeq/g

The charge balance obtained by dividing the sum of the positive charge by the sum of the negative charge was 0.923. The RSD of the ratio, using propagation of error techniques is approximately 12 percent. The ratio 0.923 cannot be distinguished from one. The RSD associated with nitrate alone can account for the apparent discrepancy in charge balance.

Table 5-1. Cation Mass and Charge Data.

Analyte	Concentration (wet weight)	Assumed Species	Concentration of Assumed Species	RSD (Mean)	Charge
	µg/g		µg/g	%	µeq/g
Aluminum	7,620	$Al(OH)_3$	22,000	26.8	0
Chromium	2,410	$Cr(OH)_3$	4,770	36.9	0
Sodium	201,000	Na^+	201,000	4.1	8,740
Total			228,000	4.5	8,740

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	2,320	Cl^-	2,320	19.0	65
Nitrate	481,000	NO_3^-	481,000	12.4	7,760
Nitrite	25,100	NO_2^-	25,100	18.6	546
Oxalate	3,120	$C_2O_4^{2-}$	3,120	28.5	71
Phosphate	12,300	PO_4^{3-}	12,300	39.5	388
Sulfate	4,490	SO_4^{2-}	4,490	27.5	94
TIC	2,750	CO_3^{2-}	13,800	28.7	460
TOC	2,070	$C_2H_3O_2^-$	5,090	30.5	86
Total			547,000	11.0	9,470

Table 5-3. Mass Balance Totals.

Totals	Concentrations	RSD (Mean)
	µg/g	%
Total from Table 5-1	228,000	4.5
Total from Table 5-2	547,000	11.0
Water %	227,000	16.3
Grand Total	1,000,000	7.1

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

5.2 COMPARISON OF HISTORICAL WITH ANALYTICAL RESULTS

Before the 1995 and 1996 sampling events, the most recent sampling of tank 241-U-107 occurred in December 1974. Because of multiple waste transfers since the last sampling event, it is not reasonable to compare the results of the sampling events. Appendix C reports the 1974 results for information only.

5.3 TANK WASTE PROFILE

According to the Hanlon estimate (1996), 3.97 m (13.0 ft) of tank 241-U-107 waste was expected to consist of 117 kL (31 kgal) of supernate overriding 1,363 kL (360 kgal) of saltcake and 57 kL (15 kgal) of sludge. The saltcake and sludge layers include 556 kL (147 kgal) of drainable interstitial liquid. The TLM estimates (see Figure 2-3) differed from the Hanlon estimates in that the saltcake was expected to be 1,132 kL (299 kgal) and the sludge layer 288 kL (76 kgal).

The photographic montage of the waste surface showed the waste surface to be primarily liquid with a mixture of solid material uniformly dispersed.

The visual descriptions of the samples indicated variations in color between segments; most segments were gray to black, but some were yellow, white, green, and brown. The texture varied from wet to dry saltcake to a sludge. The core sampling did not reach the tank bottom for any core (Jo 1996a). The predicted sludge layer was not sampled because the waste was hard and could not obtain the bottom 27 inches of the sample. Based on all the above information, the tank waste appears to be somewhat heterogeneous.

Standard statistical ANOVA models were fit to the 1996 core, segment, and subsegment data. The results from these models can be used to judge vertical and horizontal variability in analyte concentrations. Nested random effects ANOVA models were fit to the analytical data if 50 percent or more of the individual primary and duplicate measurements were above detection limit. This is the same detect/nondetect rule applied to the overall mean estimates. When nondetected results are used as quantitative values, the mean concentrations, inventory estimates, and ANOVA results are biased. The magnitude of the bias cannot be estimated. Therefore, the results of the ANOVA calculations in which nondetected results were used should be used with caution.

The p-value from the ANOVA models is compared to a standard significance level ($\alpha = 0.05$). If it is less than 0.05, the analyte means are significantly different. If a p-value is greater than 0.05, the analyte means are not significantly different. Because the data set is unbalanced for both solids and liquids, the p-values are approximations. In the following paragraphs, the p-values are in parentheses.

Regarding the liquid samples, the results of the ANOVA indicated significant differences occurred in the mean concentration between cores for 6 of 28 analytes tested: boron (0.034), chromium (0.003), nickel (0.002), potassium (0.032), silver (0.004), and sulfur (0.010). The ANOVA also indicated significant concentration differences occurred between segments for 23 of 28 analytes tested: weight percent water (< 0.001), aluminum (< 0.001), calcium (0.011), ^{137}Cs (< 0.001), chloride (0.003), chromium (< 0.001), molybdenum (0.001), nitrate (< 0.001), nitrite (0.003), oxalate (< 0.001), phosphate (0.001), phosphorus (0.001), potassium (0.024), silicon (< 0.001), silver (0.042), sodium (< 0.001), $^{89/90}Sr$ (< 0.001), sulfate (< 0.001), sulfur (0.004), TIC (< 0.001), TOC (< 0.001), zinc (< 0.001), and pH (< 0.001).

The ANOVA model was also fit to concentration data on the solid samples. No significant differences occurred in the mean analyte concentrations between cores of the 25 analytes tested. The ANOVA did indicate that 16 of 26 analytes tested for differences between segments were significant: aluminum (< 0.001), cadmium (0.029), calcium (< 0.001), chromium (0.001), iron (< 0.001), manganese (0.001), nickel (0.002), nitrate (0.020), oxalate (0.026), phosphate (< 0.001), phosphorus (< 0.001), potassium (< 0.001), sodium (0.003), sulfate (< 0.001), sulfur (< 0.001), zinc (< 0.001). In addition, differences in concentrations occurred between subsegments for 17 of 27 analytes: weight percent water (< 0.001), aluminum (0.006), boron (0.015), bulk density (< 0.001), chloride (0.007), manganese (0.010), nitrate (0.022), nitrite (< 0.001), potassium (< 0.001), silicon (< 0.001), silver (0.019), sodium (< 0.001), sulfur (< 0.001), TIC (< 0.001), TOC (< 0.001), total alpha activity (< 0.001), ^{137}Cs (0.013).

In summary, all the following indicated a relatively high degree of tank vertical heterogeneity: the Hanlon (1996) estimates, the TLM, the photographic montage, the visual descriptions of the samples, and the statistical results. At least two waste phases are present, and most analytes from the segment and subsegment level statistical analyses showed concentration differences. Results about the horizontal disposition of the waste are less clear. A few liquid samples showed differences between cores; none of the solid samples did.

5.4 COMPARISON OF TRANSFER HISTORY WITH ANALYTICAL RESULTS

Table 5-4 shows the historical tank contents estimate (HTCE) prediction for the contents of tank 241-U-107 and 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 only.

Table 5-4. Comparison of Historical Estimates with the 1996 Analytical Results for Tank 241-U-107.[1,2]

Analyte	HTCE Estimate[3]	1996 Analytical Result
METALS	µg/g	µg/g
Aluminum	57,300	8,230
Calcium	1,280	282
Chromium	1,570	2,270
Iron	1,300	742
Manganese	112	301
Nickel	205	25.8
Potassium	1,140	922
Silicon	1,220	192
Sodium	1.60E+05	1.98E+05
ANIONS	µg/g	µg/g
Chloride	3,810	2,560
Nitrate	1.72E+05	4.61E+05
Nitrite	60,600	28,200
Phosphate	4,590	11,600
Sulfate	12,300	4,480
Oxalate	1.79	2,960
Acetate	196	5,230[4]
Carbonate	14,700	14,200[5]

Notes:

[1]Agnew et al. (1996a)
[2]Jo (1996b)
[3]The data are not validated and should be used with caution.
[4]Calculated from TOC.
[5]Calculated from TIC.

Comparing the HTCE with the analytical values gives varied results. Some analytes are reasonably close in their estimates, and others are very different. In general, most comparisons were the same order of magnitude.

5.5 EVALUATION OF PROGRAM REQUIREMENTS

The three core samples retrieved from tank 241-U-107 in February and March 1996 were taken to meet the requirements of the safety screening DQO (Dukelow et al. 1995), the organic DQO (Turner et al. 1995), and the waste compatibility DQO (Fowler 1995). In addition, a waste compatibility evaluation was performed on the results of a 1995 grab sampling event. This section discusses the specific requirements of these DQOs and makes a comparison between the analytical results and the defined concentration limits. Section 5.5.1 details the safety evaluations required by the three DQOs, and section 5.5.2 details the pertinent operations decision rules specified in the waste compatibility DQO.

5.5.1 Safety Evaluation

Data criteria in the safety screening DQO are used to assess tank waste safety and to check for unknown safety issues, and the data criteria in the organic DQO are used to assess the possibility of an exothermic reaction between precipitated nitrate or nitrite salts and organic complexants. The waste compatibility DQO establishes criteria to prevent safety or operational problems that could be caused by transferring waste. The set of primary analyses required by the three DQOs include TGA to determine the moisture content, DSC and TOC to evaluate energetics and fuel content, total alpha activity to determine the criticality potential, specific gravity/density measurements to evaluate the potential for flammable gas accumulation within the waste, a visual check of drainable liquid samples for the presence of a separable organic layer, and a measurement of the flammability of tank headspace gases. In addition, the waste compatibility DQO imposes limits on the tank contents to control corrosion. The safety screening DQO also requires full vertical profiles of the tank waste. Because of the compact nature of the waste, the bottom portion of the tank was not sampled. The tank must be resampled to satisfy the requirements of the safety screening DQO. For each required analysis, a decision threshold was established by the DQOs which, if exceeded, may warrant further investigation to assure tank safety. Table 5-5 and 5-6 list applicable safety issues, decision variables, DQO thresholds, and the mean analytical results for the safety, organic complexant and waste compatibility DQOs.

Table 5-5. Decision Variables and Criteria for the Safety Screening and Organic Complexant Data Quality Objectives.

Safety Issue	Primary Decision Variable	Decision Criteria Threshold	Analytical Result
Ferrocyanide/ Organics	Total fuel content	-480 J/g[1]	2 samples exceeded limit. Highest value = -577.5 J/g[1]
Organics	Total organic carbon	Solids: 30,000 μg C/g[1]	No samples exceeded limit. Solids: 16,100 μg C/g[1] Liquids: 13,700 μg C/mL[1,2]
Organic content	Visual organic layer (liquids only)	Presence	No separable organic layer noted.
Moisture content	Weight percent water	17%	No samples exceeded limit. Solids: 22.7% Liquids: 49.6%
Criticality	Total alpha	Solids: 32.7 μCi/g Liquids: 61.5 μCi/mL	No samples exceeded limit. Solids: 0.910 μCi/g[2] Liquids: < 0.0172 μCi/mL[2]
Flammability	Flammable gas	25% of the LFL	No samples exceeded limit. 4% of the LFL[2]

Note:

[1]Value is reported on a dry weight basis.
[2]Highest recorded value.

Table 5-6. Safety Decision Variables and Criteria for the Waste Compatibility Data Quality Objective. (2 sheets)

Safety Issue	Primary Decision Variable	Decision Criteria Threshold	Mean Analytical Result
Energetics	Total fuel content	1.0 exotherm/endotherm ratio	ratio = 0.377[1]
Organic layer	Organic layer	Presence of organic layer	No organic layer
Criticality	Total alpha activity (Pu)	0.05 g/gal (0.812 μCi/mL)[2]	< 4.52E-05 μCi/mL
Flammable gas accumulation	Waste density	1.3 g/mL	1.40 g/mL
Corrosion	Concentration of nitrate, hydroxide, and nitrite	3.0 M < $[NO_3^-]$ ≤ 5.5 M; and 0.3 M ≤ $[OH^-]$ < 10.0 M; and $[OH^-] + [NO_2^-] \geq 1.2$ M	$[NO_3^-]$ = 3.84 M $[OH^-]$ = 1.56 M $[NO_2^-]$ = 2.09 M

Notes:

[1]Highest recorded value.

[2]Although the actual decision criterion listed in the DQO was 0.05 g/gal, total alpha was measured in μCi/mL. To convert the notification limit for total alpha into the same units as the laboratory, it was assumed that all alpha decay originated from ^{239}Pu . Then, by using the specific activity of ^{239}Pu (0.0615 Ci/g), the decision criterion may be converted to 0.812 μCi/mL as shown:

$$\left[\frac{0.05\ g}{gal}\right]\left[\frac{1\ gal}{3{,}785\ mL}\right]\left[\frac{0.0615\ Ci}{1\ g}\right]\left[\frac{10^6\ \mu Ci}{1\ Ci}\right] = 0.812\ \frac{\mu Ci}{mL}$$

The safety screening and organic DQOs established a decision threshold of -480 J/g (dry weight basis) for the DSC analyses. To compare to this limit, all analytical results discussed below were converted to a dry weight basis. Two liquid samples had DSC results that exceeded the decision threshold. The mean result of core 135, segment 1 was -558.7 J/g; the upper limit to one-sided 95 percent confidence intervals on the mean was 677.7 J/g. The mean result of core 135 segment, 1R was -537.6 J/g; and the upper limit to one-sided 95 percent confidence intervals on the mean was -674.0 J/g. All exothermic results from the solids were below the decision threshold, and the largest of the upper limit to one-sided 95 percent confidence intervals on the mean was -467.8 J/g. The waste compatibility DQO threshold specifies that the absolute value of the exotherm/endotherm ratio must be < 1.0

for any transfer to be allowed. All sample results had an exotherm/endotherm ratio < 1.0, ranging from 0.0494 to 0.377.

The safety screening, organic, and waste compatibility DQOs established a decision threshold of 30,000 μg C/g for TOC (dry weight basis). All results were well below the established action limit after being converted to dry weight. The highest reported solid result was 16,100 μg C/g, and the highest reported liquid result was 13,700 μg C/mL (Jo 1996b). The highest upper limit to one-sided 95 percent confidence intervals on the mean for all samples was 20,400 μg C/g.

Criticality potential can be assessed from total alpha activity data. The safety screening decision threshold is 1 g/L, which converts to 32.7 μCi/g for the solids using the highest recorded density of 1.88 g/mL and 61.5 μCi/mL for the liquids. The calculated overall mean for the solids portion of the tank was 0.102 μCi/g, and the overall mean for the liquid portion was < 0.0108 μCi/mL. The upper limit to one-sided 95 percent confidence intervals on the mean ranged between 0.00240 μCi/mL and 0.0165 μCi/mL for the liquids and between 0.00320 μCi/g and 1.71 μCi/g for the solids. The waste compatibility DQO threshold for total alpha activity was ≤ 0.05 g/gal, which converts to 0.812 μCi/mL (using the ^{239}Pu factor of 0.0615 Ci/g). All results for $^{239/240}$Pu were below the detection limit.

The safety screening and waste compatibility DQOs require a visual check of liquid samples for the presence of a separable organic layer. No separable organic layer was noted in any liquid sample.

For the solid portion of the tank, six sample means for weight percent water were below the organic complexant DQO threshold of 17 percent. Because no DSC result violated the limit, secondary analyses were not performed.

The flammability of gas in the tank headspace is another safety screening DQO consideration. The notification limit for flammable gas concentration is 25 percent of the LFL. The combustible gas meter readings ranged between 0 and 4 percent of the LFL. The waste compatibility DQO flammable gas decision rule requires that the specific gravity of the waste be < 1.3 g/mL before any transfer is allowed. The analytical result of 1.40 g/mL exceeded the notification limit. Because waste is not being transferred currently, no early notification was required (Esch 1995).

The waste compatibility DQO specifies three additional decision rules. One specifies several waste composition limits to control corrosion (see Table 5-6). The analytical results for hydroxide, nitrate, and nitrite met the listed criteria. Another decision rule states that no high-level waste will be accepted for transfer to a tank on a Watch List tank without Department of Energy approval. The final decision rule states that potential chemical compatibility hazards are to be identified before waste is accepted into a double-shell tank, and that source wastes are to be categorized according to a compatibility matrix specified in Fowler (1995). Evaluation of the latter two decision rules is outside the scope of this report.

Another factor in assessing tank safety is the heat generation and waste temperature. Heat is generated in tanks from radioactive decay. The estimated heat load based on the 1996 data was 1,017 W (3,470 Btu/hr) (see Table 5-7). The HTCE estimate of heat load was 2,520 W (8,600 Btu/hr) and an estimate based on the tank headspace temperature was 1,610 W (5,480 Btu/hr) (Kummerer 1994). All estimates are well below the 11,700 W (40,000 Btu/hr) operating specification limit for single-shell tanks (Bergmann 1991). The tank has exhibited upper temperature extreme in the past, which no longer exist (see Section 2.4.3), it may be concluded that any heat generated from radioactive sources throughout the year is dissipated.

Table 5-7. Tank 241-U-107 Projected Heat Load.[1]

Radionuclide	Liquids			Solids			Total[2] Watts
	μCi/mL	Ci	Watts	μCi/g	Ci	Watts	
^{241}Am	< 0.680	< 79.6	< 2.61	< 0.592	< 1,280	< 42.0	< 44.6
^{137}Cs	338	39,500	186	76.8	1.66E+05	784	970
$^{89/90}$Sr	0.413	48.3	0.32	---	---	---	0.32
^{60}Co	< 0.0196	< 2.29	< 0.035	< 0.0182	< 39.3	< 0.61	< 0.64
^{154}Eu	< 0.0768	< 9.0	< 0.08	< 0.0677	< 146	<-1.29	< 1.37
^{155}Eu	< 0.708	< 82.9	< 0.059	< 0.227	< 490	< 0.35	< 0.41
Total	340	39,700	189	78	1.68E+05	828	1,017

Notes:

--- = not available

[1]All solid results are based on analytical data from core 135. All liquid results are based on analytical data from core 135 and the grab sample except for ^{90}Sr, which includes data from all cores.

[2]Total includes less than values as upper limits in the calculation of the sum.

5.5.2 Operations Decision Rules Evaluation

The waste compatibility program requires a formal operations analysis of nonroutine transfers before they are approved. Several criteria are applied when the feasibility of a waste transfer between tanks is evaluated: the segregation of transuranic) (TRU) and non-TRU waste, heat generation, high phosphate waste, waste pumpability, complexant waste segregation, and tank waste type. Table 5-8 lists three criteria and compares them to the analytical results.

Table 5-8. Operations Decision Variables and Criteria for the Waste Compatibility Data Quality Objective.[1]

Operations Issue	Primary Decision Variable	Decision Criteria Threshold	Mean Analytical Result
Transuranics	TRU elements	[TRU] $\leq$ 0.1 μCi/g	< 0.00129 μCi/g
Heat load	Heat generation rate	$\leq$ 20,500 W (70,000 Btu/hr)	189 W (645 Btu/hr)
High phosphate waste		$[PO_4^{3-}]$ < 0.1 M	< 0.0403 M

Note:
[1]Fowler (1995)

The first criterion required the segregation of TRU from non-TRU elements in the waste. If the TRU concentration in the tank is $\geq$ 0.1 μCi/g, then the waste must be transferred to a TRU storage tank only. The mean analytical result of < 0.00185 μCi/mL (< 0.00129 μCi/g), based on the 1995 ^{241}Am and $^{239/240}$Pu data, was well below the TRU threshold. All drainable liquid results from the core samples were reported as nondetects.

The heat generation threshold depends on the operating specification document limit for the receiving tank. The estimated heat load of tank supernate (see Table 5-7) was 189 W (645 Btu/hr), far below the double-shell tank limit of 20,500 W (70,000 Btu/hr) (Harris 1994).

High phosphate waste, defined as > 0.1 M, is not to be mixed with defined concentrations of certain other waste types. Because the phosphate concentration of tank 241-U-107 was < 0.0403 M, this issue was not a concern.

The last three operations issues are not comparable to analytical results. They are outside the scope of this report and are for information only. The issues concern the following: if a source waste stream is designated as complexant, it must be transferred to a complexant waste receiver tank; all waste transfers must be in accordance to a matrix that categorizes tank waste types by compatibility; and inputs to the waste pumpability issue are density, viscosity, volume percent solids, pipe diameter, and pump velocity (Fowler 1995).

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6.0 CONCLUSIONS AND RECOMMENDATIONS

The waste in tank 241-U-107 was core sampled in February and March 1996 in accordance with the *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995), *Data Quality Objective to Support Resolution of the Organic Complexant Safety Issue* (Turner et al. 1995), and *Data Quality Objectives for Tank Farms Waste Compatibility Program* (Fowler 1995). The requirements for these documents were integrated into the *Tank 241-U-107 Push Mode Core Sampling and Analysis Plan* (Jo 1996c). All analyses were performed at the Westinghouse Hanford Company 222-S Laboratory. The tank supernate was grab sampled in April 1995. A waste compatibility evaluation was performed on the analytical results.

Comparisons were made between the analytical results and the decision thresholds in the DQOs. Two liquid samples exhibited exothermic reactions with changes in enthalpy greater than the decision limit of -480 J/g. The mean DSC result of the drainable liquid from core 135, segment 1 was -558.7 J/g. The mean DSC result of the drainable liquid from core 135, segment 1R was -537.6 J/g. The overall solids mean for total alpha activity was 0.102 μCi/g, well below the calculated safety screening threshold of 32.7 μCi/g. The overall liquids mean for total alpha activity was $<$ 0.0108 μCi/mL, well below the waste compatibility threshold of 0.812 μCi/mL.

All TOC results were well below the action limit of 30,000 μg C/g (dry weight basis). The highest reported TOC result for the solids was 16,100 μg C/g, and the highest recorded liquid result was 13,700 μg C/mL (all results dry weight). The overall mean weight percent water for the solid portion of the waste was 22.7 percent. For the solid portion of the tank, six sample means for weight percent water were below the organic complexant DQO threshold of 17 percent. Because no solid DSC result violated the action limit, secondary analyses were not performed. Flammable gas concentration in the tank headspace ranged from 0 to 4 percent of the LFL.

The headspace of tank 241-U-107 was sampled in the February 1995 for gases and vapors to address DQO for flammability and industrial hygiene concerns (Osborne 1994). It was determined that no headspace constituents exceeded the flammability notification limits, but that ammonia, measured to be 453 ppmv in dry air, exceeded the 150 ppmv industrial hygiene notification limit specified in the current Vapor Sampling Analysis Plan (Homi 1995). However, because the ammonia is in the tank headspace and not in the breathing zone, it will not impact worker health. Although the specific gravity mean of 1.43 g/mL exceeded the waste compatibility limit of 1.3 g/mL, no early notification was required according to an agreement with the West Systems Engineering cognizant engineer (Esch 1995). Finally, the concentrations of hydroxide, nitrate, and nitrite were within their prescribed corrosion specifications.

The waste compatibility DQO also requires an operations analysis of nonroutine transfers before they are approved. Several decision criteria apply; all analytical results met the criteria. The concentration of TRU elements in the tank (0.00129 μCi/g) was below the

threshold of 0.1 μCi/g, indicating that the waste may be transferred to a non-TRU classified waste tank. Concerns about the mixing of high phosphate waste with certain other waste types was not an issue because the phosphate result of 0.0403 M was well below the high phosphate threshold of > 0.1 M. The estimate of the supernate heat load based on the analytical data was 189 W (645 Btu/hr), indicating no waste compatibility concerns. The estimate of the tank heat load was 1,017 W (3,470 Btu/hr) and the HTCE estimate was 2,520 W (8,600 Btu/hr). Because the tank exhibits an upper temperature limit, it may be concluded that any heat generated from radioactive sources throughout the year is dissipated.

Because the weight percent water results were greater than 17 percent, the tank may be considered conditionally safe according to the organic DQO (Turner et al. 1995). Although large exothermic reactions were found for two samples, the water contents were well above the minimum required to prevent a propagating exothermic reaction. Core sampling was hindered by very compact and hard areas of the waste. As a result, sample recoveries were much less than expected and an incomplete vertical profile was obtained. The tank must be resampled to meet the requirements of the safety screening and organic DQOs.

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 Northeast Quadrant*, WHC-SD-WM-TI-615, Rev. 1, 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, 1976, *107-U Tank Arrangement As Built*, Drawing H-2-70120, 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 U Tank Farm*, WHC-SD-WM-ER-325, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Brown, R. G., *Compilation of Hydrogen Data for 22 Single-Shell Flammable Gas Watch List Tanks*, WHC-SD-WM-ER-576, Rev. 0, Westinghouse Hanford Company, Richland Washington.

DeLorenzo, 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.

Esch, R. A., 1995, *Waste Compatibility Results for 241-U-107 Grab Samples*, Internal Memo, 8E480-95-027, Westinghouse Hanford Company, Richland, Washington.

Fowler, K. D., 1995, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 1, 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.

Harris, J. P., 1994, *Unclassified Operating Specifications for the 241-AN, AP, AW, AY, AZ, and SY Tank Farms*, OSD-T-151-00007, Rev. H-8, Westinghouse Hanford Company, Richland, Washington.

Homi, C. S., 1995, *Vapor Sampling and Analysis Plan*, WHC-SD-WM-TP-335, Rev. 0G, Westinghouse Hanford Company, Richland, Washington.

Horton, J. E., 1975a, *Analysis of Sludge Sample From Tank 107-U*, (internal letter to W. R. Christensen, January 20), Atlantic Richfield Hanford Company, Richland, Washington.

Horton, J. E., 1975b, *Waste Solution Solidification by Volume Reduction (Achievement Report for Period Ending February 4, 1975)*, (internal report, budget number E-52204, to N. L. Harms, February 4), Atlantic Richfield Hanford Company, Richland, Washington.

Huckaby, J. L., and D. Bratzel, 1995, *Tank 241-U-107 Headspace Gas and Vapor Characterization Results for Samples Collected in February 1995*, WHC-SD-WM-ER-451, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Jo, J., 1996a, *45-Day Safety Screening Results for Tank 241-U-107, Push Mode Cores 129, 134, and 135*, WHC-SD-WM-DP-184, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Jo, J., 1996b, *Final Report for Tank 241-U-107, Push Mode Cores 129, 134, and 135*, WHC-SD-WM-DP-184, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Jo, J., 1996c, *Tank 241-U-107 Push Mode Core Sampling and Analysis Plan*, WHC-SD-WM-TSAP-076, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

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

Kristofzski, J.G., 1995, "Directions for Opportunistic Analyses," Letter 75310-95-103 (to J. H. Baldwin, September 13), 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.

Osborne, J. W., J. Huckaby, T. Rudolph, E. Hewitt, D. Mahlum, J. Young, and C. Anderson, 1994, *Data Quality Objectives for Generic In-Tank Health and Safety Issue Resolution*, WHC-SD-WM-DQO-002, Westinghouse Hanford Company, Richland, Washington.

Rogers, R. D., and H. Daniels, 1944, *Specifications for Construction of Composite Storage Tanks Bldg. #241 at Hanford Engineer Works*, CVI-73550, E. I. Du Pont de Nemours & Co., Richland, Washington.

Turner, D. A., H. Babad, L. Buckley, and J. Meacham, 1995, *Data Quality Objective to Support Resolution of the Organic Complexant Safety Issue*, WHC-SD-WM-DQO-006, Rev. 2, 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, 1979, *Piping Waste Tank Isolation TK-241-U-107*, Drawing H-2-73155, Rev. 1, Vitro Engineering Corporation, Richland, Washington.

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

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APPENDIX A

ANALYTICAL RESULTS FROM 1996 CORE SAMPLING AND 1995 GRAB SAMPLING OF SINGLE-SHELL TANK 241-U-107

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A.0 ANALYTICAL RESULTS FROM 1996 CORE SAMPLING AND 1995 GRAB SAMPLING OF SINGLE-SHELL TANK 241-U-107

A.1 INTRODUCTION

Appendix A reports the chemical, radiochemical and physical characteristics of tank 241-U-107 in terms of specific concentrations of metals, ions, radionuclides, and physical properties.

Each table lists the following: laboratory sample identification, sample origin (core/segment/subsegment), an original and duplicate result for each sample, a sample mean, a mean result 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, pH, 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.

A description of the units and symbols used in the analyte tables and the references used in compiling the analytical data (Jo 1996b) are 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

Column 1 lists the laboratory sample for which the analyte was measured.

Column 2 identifies the core and segment from which each sample was derived.

Column 3 identifies the segment portion (subsegment) from which the sample was taken. This may 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).

Columns 4 and 5, Result and Duplicate, are self-explanatory. Column 6 lists the average of the result and duplicate values. If the result and duplicate values were both detected, or one of two values is detected and the other nondetected, then the mean is expressed as a detected value. If the result and duplicate values were nondetected, then the mean is expressed as a nondetected value. The result and duplicate values, and the result and 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 because the analytical results 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-U-107 were calculated as follows.

Individual sample result and duplicate pairs were averaged to obtain a sample mean. Sample means from the same segment were 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. Not all steps were necessary for each analyte or for each subsegment, but the procedure to be followed is the same. Since the grab sample and core 134 were taken from the same riser, results from grab sample U-107-1 were averaged with the drainable liquid results from core 134 as if it were a separate segment. All values, including those below the detection level (indicated by the less-than symbol, "<"), were used in calculating the overall means. If 50 percent or more of all individual sample and duplicate results were detected, then the overall mean was expressed as a detected value. If less than 50 percent of all individual results were detected, then the overall mean was expressed as a nondetected value. If nondetected results are used as quantitative values, the mean concentrations and inventory estimates are biased. The magnitude of the bias cannot be estimated. Those particular results should be used with caution.

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. If nondetected results are used as quantitative values, the RSD are biased. The magnitude of the bias cannot be estimated. Thus, the RSD (mean) estimates and the ANOVA values in which nondetected results were used should be interpreted with caution.

Projected Inventory is the product of the overall analyte concentration mean, the volume of tank waste (1,420 kL [375 kgal] for the solids and 117 kL [31 kgal] for the liquids), the density, where applicable (1.52 mL for the solids), and the appropriate conversion factors.

Wash water contamination precluded using analytical data from core 134, segment 6A. The results from this segment are reported in the following tables for information only; they were not factored into the overall mean calculations.

The four quality control parameters assessed on the tank 241-U-107 samples were standard recoveries, spike recoveries, duplicate analyses (RPDs), and blanks (see Section 5.1.2). More specific information is provided in the tables below. Sample and duplicate pairs, in which any quality control 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 quality control range.
QC:b -- indicates that the standard recovery was above the quality control range.
QC:c -- indicates that the spike recovery was below the quality control range.
QC:d -- indicates that the spike recovery was above the quality control range.
QC:e -- indicates that the RPD was greater than the quality control limit range.
QC:f -- indicates blank contamination.

Table A-1. Tank 241-U-107 Analytical Results: Aluminum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	21,100	20,900	21,000[QC:d]	7,620	26.8	16,400
S96T000789		Lower ½	11,900	12,700	12,300			
S96T000790	129:3	Upper ½	6,370	5,780	6,080			
S96T000791		Lower ½	5,730	5,020	5,380			
S96T001152	129:3R	Upper ½	3,180	3,040	3,110[QC:d]			
S96T001080	134:2	Upper ½	3,090	2,650	2,870[QC:c,e]			
S96T002284		Upper ½	2,850	3,340	3,100[QC:e]			
S96T001081	134:3	Upper ½	4,510	4,690	4,600			
S96T002285		Upper ½	5,060	5,010	5,040			
S96T001083	134:4	A	10,400	10,400	10,400			
S96T002287		A	13,400	11,400	12,400[QC:e]			
S96T001084		B	13,800	14,500	14,200			
S96T002288		B	15,300	15,100	15,200			
S96T001082		Lower ½	19,500	18,300	18,900			
S96T002286		Lower ½	21,100	20,900	21,000			
S96T001086	134:5	A	11,600	21,100	16,400[QC:e]			
S96T001085		B	14,300	20,900	17,600[QC:d,e]			
S96T001087	134:5A	A	7,560	7,280	7,420			
S96T001088	134:6A	Whole	5,320	5,180	5,250			

Table A-1. Tank 241-U-107 Analytical Results: Aluminum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	5,230	5,110	5,170[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	1,520	1,530	1,520[QC:a]			
S96T001878		Lower ½	1,850	1,910	1,880[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	24,900	23,800	24,400	23,100	3.5	2,700
S96T000682	129:2	DL	22,500	22,500	22,500			
S96T001119	134:5B	DL	27,000	26,800	26,900[QC:c]			
S96T001121	134:6A	DL	81.00	80.80	80.90			
S96T002140	135:1	DL	21,500	21,400	21,400			
S96T002141	135:1R	DL	23,500	23,500	23,500			
S96T002142	135:2A	DL	21,100	20,800	21,000[QC:c]			
S95T000792	U-107-1(Grab)	DL	21,500	20,725	21,100			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-2. Tank 241-U-107 Analytical Results: Antimony. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 27.90	< 26.0	< 27.0	< 33.6	N/A	< 75.5
S96T000789		Lower ½	< 27.20	< 28.4	< 27.8			
S96T000790	129:3	Upper ½	< 29.60	< 25.8	< 27.7			
S96T000791		Lower ½	< 30.70	< 30.3	< 30.5			
S96T001152	129:3R	Upper ½	< 33.50	< 30.5	< 32.0			
S96T001080	134:2	Upper ½	< 35.70	< 30.4	< 33.1			
S96T002284		Upper ½	< 58.30	56.30	57.3			
S96T001081	134:3	Upper ½	< 33.90	< 35.1	< 34.5			
S96T002285		Upper ½	< 59.30	< 59.4	< 59.4			
S96T001083	134:4	A	< 36.00	< 34.5	< 35.3			
S96T002287		A	< 60.50	< 53.8	< 57.2			
S96T001084		B	< 31.80	< 32.0	< 31.9			
S96T002288		B	109	< 52.4	80.7			
S96T001082		Lower ½	< 31.90	< 32.9	< 32.4			
S96T002286		Lower ½	< 55.10	< 53.6	< 54.4			
S96T001086	134:5	A	< 32.80	< 36.2	< 34.5			
S96T001085		B	< 35.30	< 33.3	< 34.3			
S96T001087	134:5A	A	< 31.10	< 39.4	< 35.3			

Table A-2. Tank 241-U-107 Analytical Results: Antimony. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001088	134:6A	Whole	< 10.90	< 11.4	< 11.2	Cont.	Cont.	Cont.
S96T002161	135:2A	Whole	< 29.50	< 27.6	< 28.6			
S96T001877	135:2R	Upper ½	< 28.40	< 29.5	< 29.0			
S96T001878		Lower ½	< 27.70	< 26.5	< 27.1			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 60.10	< 60.1	< 60.1	< 44.1	N/A	< 5.16
S96T000682	129:2	DL	< 60.10	< 60.1	< 60.1			
S96T001119	134:5B	DL	< 36.10	< 36.1	< 36.1			
S96T001121	134:6A	DL	< 2.460	< 2.46	< 2.46			
S96T002140	135:1	DL	< 36.10	< 36.1	< 36.1			
S96T002141	135:1R	DL	< 36.10	< 36.1	< 36.1			
S96T002142	135:2A	DL	< 36.10	< 36.1	< 36.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-3. Tank 241-U-107 Analytical Results: Arsenic. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 46.50	< 43.4	< 45.0	< 55.3	N/A	< 119
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	< 53.20	< 54.8	< 54.0			
S96T002286		Lower ½	< 91.80	< 89.3	< 90.6			
S96T001086	134:5	A	< 54.60	< 60.4	< 57.5			
S96T001085		B	< 58.80	< 55.5	< 57.2			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-3. Tank 241-U-107 Analytical Results: Arsenic. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-4. Tank 241-U-107 Analytical Results: Barium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 23.30	< 21.7	< 22.5	< 27.7	N/A	< 59.8
S96T000789		Lower ½	< 22.70	< 23.7	< 23.2			
S96T000790	129:3	Upper ½	< 24.70	< 21.5	< 23.1			
S96T000791		Lower ½	< 25.50	< 25.2	< 25.4			
S96T001152	129:3R	Upper ½	< 27.90	< 25.4	< 26.7			
S96T001080	134:2	Upper ½	< 29.70	< 25.3	< 27.5			
S96T002284		Upper ½	< 48.50	< 46.4	< 47.5			
S96T001081	134:3	Upper ½	< 28.30	< 29.3	< 28.8			
S96T002285		Upper ½	< 49.40	< 49.5	< 49.5			
S96T001083	134:4	A	< 30.00	< 28.7	< 29.4			
S96T002287		A	< 50.40	< 44.8	< 47.6			
S96T001084		B	< 26.50	< 26.7	< 26.6			
S96T002288		B	< 41.90	< 43.6	< 42.8			
S96T001082		Lower ½	< 26.60	< 27.4	< 27.0			
S96T002286		Lower ½	< 45.90	< 44.7	< 45.3			
S96T001086	134:5	A	< 27.30	< 30.2	< 28.8			
S96T001085		B	< 29.40	< 27.8	< 28.6			
S96T001087	134:5A	A	< 25.90	< 32.8	< 29.4			
S96T001088	134:6A	Whole	< 9.060	< 9.49	< 9.28			

Table A-4. Tank 241-U-107 Analytical Results: Barium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 24.60	< 23.0	< 23.8	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 23.70	< 24.6	< 24.2			
S96T001878		Lower ½	< 23.10	< 22.1	< 22.6			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 50.00	< 50.0	< 50.0	< 36.7	N/A	< 4.29
S96T000682	129:2	DL	< 50.00	< 50.0	< 50.0			
S96T001119	134:5B	DL	< 30.10	< 30.1	< 30.1			
S96T001121	134:6A	DL	< 2.050	< 2.05	< 2.05			
S96T002140	135:1	DL	< 30.10	< 30.1	< 30.1			
S96T002141	135:1R	DL	< 30.10	< 30.1	< 30.1			
S96T002142	135:2A	DL	< 30.10	< 30.1	< 30.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-5. Tank 241-U-107 Analytical Results: Beryllium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 2.330	< 2.17	< 2.25	< 2.77	N/A	< 5.98
S96T000789		Lower ½	< 2.270	< 2.37	< 2.32			
S96T000790	129:3	Upper ½	< 2.470	< 2.15	< 2.31			
S96T000791		Lower ½	< 2.550	< 2.52	< 2.54			
S96T001152	129:3R	Upper ½	< 2.790	< 2.54	< 2.67			
S96T001080	134:2	Upper ½	< 2.970	< 2.53	< 2.75			
S96T002284		Upper ½	< 4.850	< 4.64	< 4.75			
S96T001081	134:3	Upper ½	< 2.830	< 2.93	< 2.88			
S96T002285		Upper ½	< 4.940	< 4.95	< 4.95			
S96T001083	134:4	A	< 3.000	< 2.87	< 2.94			
S96T002287		A	< 5.040	< 4.48	< 4.76			
S96T001084		B	< 2.650	< 2.67	< 2.66			
S96T002288		B	< 4.190	< 4.36	< 4.28			
S96T001082		Lower ½	< 2.660	< 2.74	< 2.70			
S96T002286		Lower ½	< 4.590	< 4.47	< 4.53			
S96T001086	134:5	A	< 2.730	< 3.02	< 2.88			
S96T001085		B	< 2.940	< 2.78	< 2.86			
S96T001087	134:5A	A	< 2.590	< 3.28	< 2.94			

Table A-5. Tank 241-U-107 Analytical Results: Beryllium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001088	134:6A	Whole	< 0.906	< 0.949	< 0.928	Cont.	Cont.	Cont.
S96T002161	135:2A	Whole	< 2.460	< 2.30	< 2.38			
S96T001877	135:2R	Upper ½	< 2.370	< 2.46	< 2.42			
S96T001878		Lower ½	< 2.310	< 2.21	< 2.26			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 5.000	< 5.00	< 5.00	< 3.67	N/A	< 0.429
S96T000682	129:2	DL	< 5.000	< 5.00	< 5.00			
S96T001119	134:5B	DL	< 3.000	< 3.00	< 3.00			
S96T001121	134:6A	DL	< 0.205	< 0.205	< 0.205			
S96T002140	135:1	DL	< 3.000	< 3.00	< 3.00			
S96T002141	135:1R	DL	< 3.000	< 3.00	< 3.00			
S96T002142	135:2A	DL	< 3.000	< 3.00	< 3.00			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-6. Tank 241-U-107 Analytical Results: Bismuth. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	48.80	61.40	55.10[QC:e]	< 64.9	N/A	< 140
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0[QC:e]			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	63.40	56.70	60.05			
S96T002286		Lower ½	< 91.80	< 89.3	< 90.6			
S96T001086	134:5	A	254	379.0	316.5[QC:e]			
S96T001085		B	107	116.0	111.5			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			

Table A-6. Tank 241-U-107 Analytical Results: Bismuth. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6	Cont.	Cont.	Cont.
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6[QC:a]			
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3[QC:a]			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-7. Tank 241-U-107 Analytical Results: Boron. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	173	146.0	159.5	89.1	17.6	192
S96T000789		Lower ½	116	146.0	131.0[QC:e]			
S96T000790	129:3	Upper ½	146	117.0	131.5[QC:e]			
S96T000791		Lower ½	117	157.0	137.0[QC:e]			
S96T001152	129:3R	Upper ½	28.90	44.80	36.85[QC:e]			
S96T001080	134:2	Upper ½	87.50	72.10	79.80[QC:e]			
S96T002284		Upper ½	99.70	69.90	84.80[QC:e]			
S96T001081	134:3	Upper ½	51.10	54.40	52.75			
S96T002285		Upper ½	118	123.0	120.5			
S96T001083	134:4	A	84.00	79.70	81.85			
S96T002287		A	127	139.0	133.0			
S96T001084		B	86.40	143.0	114.7[QC:e]			
S96T002288		B	118	138.0	128.0			
S96T001082		Lower ½	47.50	50.50	49.00			
S96T002286		Lower ½	55.80	97.00	76.40[QC:e]			
S96T001086	134:5	A	34.00	64.60	49.30[QC:e]			
S96T001085		B	34.10	144.0	89.05[QC:e]			
S96T001087	134:5A	A	43.70	137.0	90.35[QC:e]			
S96T001088	134:6A	Whole	24.90	91.20	58.05[QC:e]			

Table A-7. Tank 241-U-107 Analytical Results: Boron. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	80.80	38.90	59.85[QC:e]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	36.60	38.40	37.50			
S96T001878		Lower ½	79.90	75.20	77.55			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	68.70	64.30	66.50	70.4	5.7	8.24
S96T000682	129:2	DL	67.10	64.80	65.95			
S96T001119	134:5B	DL	79.50	78.20	78.85			
S96T001121	134:6A	DL	18.00	17.80	17.90			
S96T002140	135:1	DL	67.10	64.70	65.90			
S96T002141	135:1R	DL	69.70	69.90	69.80			
S96T002142	135:2A	DL	65.80	63.40	64.60			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-8. Tank 241-U-107 Analytical Results: Cadmium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	12.20	13.10	12.65	< 4.49	N/A	< 9.69
S96T000789		Lower ½	5.610	3.940	4.775[QC:e]			
S96T000790	129:3	Upper ½	< 2.470	< 2.15	< 2.31			
S96T000791		Lower ½	< 2.550	< 2.52	< 2.54			
S96T001152	129:3R	Upper ½	< 2.790	< 2.54	< 2.67			
S96T001080	134:2	Upper ½	< 2.970	< 2.53	< 2.75[QC:e]			
S96T002284		Upper ½	< 4.850	< 4.64	< 4.75			
S96T001081	134:3	Upper ½	< 2.830	< 2.93	< 2.88			
S96T002285		Upper ½	5.920	< 4.95	5.44			
S96T001083	134:4	A	4.130	3.820	3.975			
S96T002287		A	6.560	5.120	5.840[QC:e]			
S96T001084		B	3.480	3.640	3.560			
S96T002288		B	5.160	4.920	5.040			
S96T001082		Lower ½	7.500	7.790	7.645			
S96T002286		Lower ½	10.40	8.710	9.555			
S96T001086	134:5	A	9.360	16.60	12.98[QC:e]			
S96T001085		B	8.930	8.210	8.570			
S96T001087	134:5A	A	< 2.590	< 3.28	< 2.94			
S96T001088	134:6A	Whole	< 0.906	< 0.949	< 0.928			

Table A-8. Tank 241-U-107 Analytical Results: Cadmium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 2.460	< 2.30	< 2.38[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 2.370	< 2.46	< 2.42[QC:a]			
S96T001878		Lower ½	< 2.310	< 2.21	< 2.26[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 5.000	< 5.00	< 5.00	< 3.67	N/A	< 0.429
S96T000682	129:2	DL	< 5.000	< 5.00	< 5.00			
S96T001119	134:5B	DL	< 3.000	< 3.00	< 3.00			
S96T001121	134:6A	DL	< 0.205	< 0.205	< 0.205			
S96T002140	135:1	DL	< 3.000	< 3.00	< 3.00			
S96T002141	135:1R	DL	< 3.000	< 3.00	< 3.00			
S96T002142	135:2A	DL	< 3.000	< 3.00	< 3.00			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-9. Tank 241-U-107 Analytical Results: Calcium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	641	689.0	665.0	298	17.4	643
S96T000789		Lower ½	659	337.0	498.0[QC:e]			
S96T000790	129:3	Upper ½	292	424.0	358.0[QC:e]			
S96T000791		Lower ½	341	232.0	286.5[QC:e]			
S96T001152	129:3R	Upper ½	138	184.0	161.0[QC:e]			
S96T001080	134:2	Upper ½	194	163.0	178.5[QC:c,e]			
S96T002284		Upper ½	204	221.0	212.5[QC:e]			
S96T001081	134:3	Upper ½	207	218.0	212.5			
S96T002285		Upper ½	240	246.0	243.0			
S96T001083	134:4	A	249	250.0	249.5			
S96T002287		A	212	236.0	224.0			
S96T001084		B	195	252.0	223.5[QC:e]			
S96T002288		B	250	241.0	245.5[QC:e]			
S96T001082		Lower ½	326	315.0	320.5			
S96T002286		Lower ½	331	321.0	326.0			
S96T001086	134:5	A	387	668.0	527.5[QC:e]			
S96T001085		B	481	449.0	465.0			
S96T001087	134:5A	A	271	253.0	262.0			
S96T001088	134:6A	Whole	110	123.0	116.5			

Table A-9. Tank 241-U-107 Analytical Results: Calcium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	175	141.0	158.0[QC:e]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	234	204.0	219.0			
S96T001878		Lower ½	250	152.0	201.0[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	128	116.0	122.0	95.9	7.8	11.2
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	86.00	83.10	84.55			
S96T001121	134:6A	DL	17.80	17.60	17.70			
S96T002140	135:1	DL	89.70	87.10	88.40			
S96T002141	135:1R	DL	98.40	93.20	95.80			
S96T002142	135:2A	DL	97.20	90.70	93.95			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-10. Tank 241-U-107 Analytical Results: Cerium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 46.50	< 43.4	< 45.0	< 55.3	N/A	< 119
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9[QC:d]			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	< 53.20	< 54.8	< 54.0			
S96T002286		Lower ½	< 91.80	< 89.3	< 90.6			
S96T001086	134:5	A	< 54.60	< 60.4	< 57.5			
S96T001085		B	< 58.80	< 55.5	< 57.2			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-10. Tank 241-U-107 Analytical Results: Cerium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-11. Tank 241-U-107 Analytical Results: Chromium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	9,220	9,430	9,320[QC:d]	2,410	36.9	5,200
S96T000789		Lower ½	3,740	3,120	3,430[QC:e]			
S96T000790	129:3	Upper ½	715	666.0	690.5			
S96T000791		Lower ½	762	686.0	724.0			
S96T001152	129:3R	Upper ½	568	560.0	564.0			
S96T001080	134:2	Upper ½	616	528.0	572.0[QC:c,e]			
S96T002284		Upper ½	780	753.0	766.5[QC:e]			
S96T001081	134:3	Upper ½	1,210	1,260	1,240			
S96T002285		Upper ½	1,590	1,600	1,600			
S96T001083	134:4	A	2,110	2,120	2,120			
S96T002287		A	2,140	2,310	2,220			
S96T001084		B	2,810	3,040	2,920			
S96T002288		B	3,320	3,100	3,210			
S96T001082		Lower ½	6,020	5,890	5,960			
S96T002286		Lower ½	6,920	6,860	6,890			
S96T001086	134:5	A	8,050	14,100	11,100[QC:e]			
S96T001085		B	8,040	8,390	8,220[QC:d]			
S96T001087	134:5A	A	2,590	2,350	2,470			
S96T001088	134:6A	Whole	46.50	47.00	46.75			

Table A-11. Tank 241-U-107 Analytical Results: Chromium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	451	375.0	413.0[QC:a,e]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	411	410.0	410.5[QC:a]			
S96T001878		Lower ½	394	397.0	395.5[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	830	796.0	813.0	567	35.3	66.3
S96T000682	129:2	DL	736	737.0	736.5			
S96T001119	134:5B	DL	164	164.0	164.0			
S96T001121	134:6A	DL	7.550	7.560	7.555			
S96T002140	135:1	DL	725	718.0	721.5			
S96T002141	135:1R	DL	799	794.0	796.5			
S96T002142	135:2A	DL	770	758.0	764.0			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-12. Tank 241-U-107 Analytical Results: Cobalt. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 9.300	< 8.67	< 8.99	< 11.1	N/A	< 24.0
S96T000789		Lower ½	< 9.080	< 9.48	< 9.28			
S96T000790	129:3	Upper ½	< 9.880	< 8.61	< 9.25			
S96T000791		Lower ½	< 10.20	< 10.1	< 10.2			
S96T001152	129:3R	Upper ½	< 11.20	< 10.2	< 10.7			
S96T001080	134:2	Upper ½	< 11.90	< 10.1	< 11.0			
S96T002284		Upper ½	< 19.40	< 18.5	< 19.0[QC:d]			
S96T001081	134:3	Upper ½	< 11.30	< 11.7	< 11.5			
S96T002285		Upper ½	< 19.80	< 19.8	< 19.8			
S96T001083	134:4	A	< 12.00	< 11.5	< 11.8			
S96T002287		A	< 20.20	< 17.9	< 19.1			
S96T001084		B	< 10.60	< 10.7	< 10.7			
S96T002288		B	< 16.80	< 17.5	< 17.2			
S96T001082		Lower ½	< 10.60	< 11.0	< 10.8			
S96T002286		Lower ½	< 18.40	< 17.9	< 18.2			
S96T001086	134:5	A	< 10.90	< 12.1	< 11.5			
S96T001085		B	< 11.80	< 11.1	< 11.5			
S96T001087	134:5A	A	< 10.40	< 13.1	< 11.8			
S96T001088	134:6A	Whole	< 3.620	< 3.80	< 3.71			

Table A-12. Tank 241-U-107 Analytical Results: Cobalt. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 9.830	< 9.21	< 9.52	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 9.480	< 9.84	< 9.66			
S96T001878		Lower ½	< 9.250	< 8.84	< 9.05			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 20.00	< 20.0	< 20.0	< 14.7	N/A	< 1.72
S96T000682	129:2	DL	< 20.00	< 20.0	< 20.0			
S96T001119	134:5B	DL	< 12.00	< 12.0	< 12.0			
S96T001121	134:6A	DL	< 0.820	< 0.820	< 0.820			
S96T002140	135:1	DL	< 12.00	< 12.0	< 12.0			
S96T002141	135:1R	DL	< 12.00	< 12.0	< 12.0			
S96T002142	135:2A	DL	< 12.00	< 12.0	< 12.0			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-13. Tank 241-U-107 Analytical Results: Copper. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	13.00	17.80	15.40[QC:e]	< 8.05	N/A	< 17.4
S96T000789		Lower ½	9.530	7.270	8.400[QC:e]			
S96T000790	129:3	Upper ½	6.870	< 4.30	5.59			
S96T000791		Lower ½	< 5.110	< 5.04	< 5.08			
S96T001152	129:3R	Upper ½	< 5.590	< 5.08	< 5.34			
S96T001080	134:2	Upper ½	< 5.940	< 5.06	< 5.50			
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49			
S96T001081	134:3	Upper ½	< 5.650	< 5.85	< 5.75			
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89			
S96T001083	134:4	A	< 6.000	< 5.74	< 5.87			
S96T002287		A	< 10.10	< 8.97	< 9.54			
S96T001084		B	5.530	< 5.34	5.44			
S96T002288		B	< 8.380	< 8.73	< 8.56			
S96T001082		Lower ½	11.30	11.00	11.15			
S96T002286		Lower ½	16.10	17.70	16.90			
S96T001086	134:5	A	28.20	37.90	33.05[QC:e]			
S96T001085		B	11.80	12.10	11.95			
S96T001087	134:5A	A	< 5.180	< 6.56	< 5.87			
S96T001088	134:6A	Whole	3.410	5.710	4.560[QC:e]			

Table A-13. Tank 241-U-107 Analytical Results: Copper. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	7.180	< 4.60	5.89	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 4.740	< 4.92	< 4.83			
S96T001878		Lower ½	< 4.620	< 4.42	< 4.52			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	< 7.34	N/A	< 0.859
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01			
S96T001121	134:6A	DL	< 0.410	0.875	0.643			
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01			
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01			
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-14. Tank 241-U-107 Analytical Results: Iron. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	1,340	1,380	1,360	799	51.1	1,720
S96T000789		Lower ½	861	692.0	776.5[QC:e]			
S96T000790	129:3	Upper ½	115	91.30	103.2[QC:e]			
S96T000791		Lower ½	112	103.0	107.5			
S96T001152	129:3R	Upper ½	80.30	76.60	78.45			
S96T001080	134:2	Upper ½	1,340	1,140	1,240[QC:e]			
S96T002284		Upper ½	140	108.0	124.0[QC:e]			
S96T001081	134:3	Upper ½	176	183.0	179.5			
S96T002285		Upper ½	229	191.0	210.0[QC:e]			
S96T001083	134:4	A	282	274.0	278.0			
S96T002287		A	308	305.0	306.5			
S96T001084		B	210	227.0	218.5			
S96T002288		B	255	239.0	247.0[QC:e]			
S96T001082		Lower ½	1,720	1,690	1,700			
S96T002286		Lower ½	1,980	2,160	2,070			
S96T001086	134:5	A	6,250	10,200	8,220[QC:e]			
S96T001085		B	3,450	3,520	3,480[QC:d]			
S96T001087	134:5A	A	802	703.0	752.5			
S96T001088	134:6A	Whole	121	116.0	118.5			

Table A-14. Tank 241-U-107 Analytical Results: Iron. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	983	914.0	948.5[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	71.40	71.00	71.20[QC:a]			
S96T001878		Lower ½	49.30	47.90	48.60[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 50.00	< 50.0	< 50.0	< 35.1	N/A	< 4.11
S96T000682	129:2	DL	< 50.00	< 50.0	< 50.0			
S96T001119	134:5B	DL	< 30.10	< 30.1	< 30.1			
S96T001121	134:6A	DL	< 2.050	< 2.05	< 2.05			
S96T002140	135:1	DL	< 30.10	< 30.1	< 30.1			
S96T002141	135:1R	DL	< 30.10	< 30.1	< 30.1			
S96T002142	135:2A	DL	< 30.10	< 30.1	< 30.1			
S95T000792	U-107-1 (Grab)	DL	< 20.1	< 20.1	< 20.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-15. Tank 241-U-107 Analytical Results: Lanthanum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 23.30	< 21.7	< 22.5	< 27.7	N/A	< 59.8
S96T000789		Lower ½	< 22.70	< 23.7	< 23.2			
S96T000790	129:3	Upper ½	< 24.70	< 21.5	< 23.1			
S96T000791		Lower ½	< 25.50	< 25.2	< 25.4			
S96T001152	129:3R	Upper ½	< 27.90	< 25.4	< 26.7			
S96T001080	134:2	Upper ½	< 29.70	< 25.3	< 27.5			
S96T002284		Upper ½	< 48.50	< 46.4	< 47.5			
S96T001081	134:3	Upper ½	< 28.30	< 29.3	< 28.8			
S96T002285		Upper ½	< 49.40	< 49.5	< 49.5			
S96T001083	134:4	A	< 30.00	< 28.7	< 29.4			
S96T002287		A	< 50.40	< 44.8	< 47.6			
S96T001084		B	< 26.50	< 26.7	< 26.6			
S96T002288		B	< 41.90	< 43.6	< 42.8			
S96T001082		Lower ½	< 26.60	< 27.4	< 27.0			
S96T002286		Lower ½	< 45.90	< 44.7	< 45.3			
S96T001086	134:5	A	< 27.30	< 30.2	< 28.8			
S96T001085		B	< 29.40	< 27.8	< 28.6			
S96T001087	134:5A	A	< 25.90	< 32.8	< 29.4			
S96T001088	134:6A	Whole	< 9.060	< 9.49	< 9.28			

Table A-15. Tank 241-U-107 Analytical Results: Lanthanum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 24.60	< 23.0	< 23.8	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 23.70	< 24.6	< 24.2			
S96T001878		Lower ½	< 23.10	< 22.1	< 22.6			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 50.00	< 50.0	< 50.0	< 36.7	N/A	< 4.29
S96T000682	129:2	DL	< 50.00	< 50.0	< 50.0			
S96T001119	134:5B	DL	< 30.10	< 30.1	< 30.1			
S96T001121	134:6A	DL	< 2.050	< 2.05	< 2.05			
S96T002140	135:1	DL	< 30.10	< 30.1	< 30.1			
S96T002141	135:1R	DL	< 30.10	< 30.1	< 30.1			
S96T002142	135:2A	DL	< 30.10	< 30.1	< 30.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-16. Tank 241-U-107 Analytical Results: Lead. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	157	169.0	163.0	< 94.4	N/A	< 204
S96T000789		Lower ½	94.90	72.70	83.80[QC:e]			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0[QC:e]			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	113	110.0	111.5			
S96T002286		Lower ½	134	138.0	136.0			
S96T001086	134:5	A	349	564.0	456.5[QC:e]			
S96T001085		B	256	266.0	261.0			
S96T001087	134:5A	A	65.10	< 65.6	65.4			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-16. Tank 241-U-107 Analytical Results: Lead. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	189	< 46.0	118[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3[QC:a]			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-17. Tank 241-U-107 Analytical Results: Magnesium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	140	136.0	138.0	< 77.0	N/A	< 166
S96T000789		Lower ½	71.20	57.00	64.10[QC:e]			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	109	108.0	108.5			
S96T002286		Lower ½	118	117.0	117.5			
S96T001086	134:5	A	273	448.0	360.5[QC:e]			
S96T001085		B	157	155.0	156.0			
S96T001087	134:5A	A	60.90	< 65.6	63.3			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-17. Tank 241-U-107 Analytical Results: Magnesium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3[QC:a]			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-18. Tank 241-U-107 Analytical Results: Manganese. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	1,260	1,310	1,280	323	54.2	697
S96T000789		Lower ½	651	508.0	579.5[QC:e]			
S96T000790	129:3	Upper ½	34.70	31.90	33.30			
S96T000791		Lower ½	32.50	28.90	30.70			
S96T001152	129:3R	Upper ½	29.80	27.30	28.55[QC:e]			
S96T001080	134:2	Upper ½	31.70	27.00	29.35[QC:e,e]			
S96T002284		Upper ½	37.00	33.30	35.15			
S96T001081	134:3	Upper ½	47.30	49.40	48.35			
S96T002285		Upper ½	80.30	65.00	72.65[QC:e]			
S96T001083	134:4	A	94.30	92.60	93.45			
S96T002287		A	102	106.0	104.0			
S96T001084		B	89.10	95.60	92.35			
S96T002288		B	113	103.0	108.0			
S96T001082		Lower ½	651	630.0	640.5			
S96T002286		Lower ½	780	771.0	775.5			
S96T001086	134:5	A	1,230	2,110	1,670[QC:e]			
S96T001085		B	2,270	2,280	2,280			
S96T001087	134:5A	A	457	404.0	430.5			
S96T001088	134:6A	Whole	21.00	19.70	20.35			

Table A-18. Tank 241-U-107 Analytical Results: Manganese. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	39.10	23.90	31.50[QC:a,e]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	29.90	28.90	29.40[QC:a]			
S96T001878		Lower ½	15.80	15.30	15.55[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	< 7.34	N/A	< 0.859
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01			
S96T001121	134:6A	DL	< 0.410	< 0.410	< 0.410			
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01			
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01			
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-19. Tank 241-U-107 Analytical Results: Molydenum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	46.40	46.90	46.65	< 30.5	N/A	< 65.8
S96T000789		Lower ½	26.20	< 23.7	25.0			
S96T000790	129:3	Upper ½	< 24.70	< 21.5	< 23.1			
S96T000791		Lower ½	< 25.50	< 25.2	< 25.4			
S96T001152	129:3R	Upper ½	< 27.90	< 25.4	< 26.7			
S96T001080	134:2	Upper ½	< 29.70	< 25.3	< 27.5[QC:e]			
S96T002284		Upper ½	< 48.50	< 46.4	< 47.5			
S96T001081	134:3	Upper ½	< 28.30	< 29.3	< 28.8			
S96T002285		Upper ½	< 49.40	< 49.5	< 49.5			
S96T001083	134:4	A	34.20	31.90	33.05			
S96T002287		A	< 50.40	< 44.8	< 47.6			
S96T001084		B	40.90	41.80	41.35			
S96T002288		B	43.50	< 43.6	43.6			
S96T001082		Lower ½	47.70	44.90	46.30			
S96T002286		Lower ½	50.10	49.70	49.90			
S96T001086	134:5	A	< 27.30	38.2	32.8			
S96T001085		B	< 29.40	< 27.8	< 28.6			
S96T001087	134:5A	A	< 25.90	< 32.8	< 29.4			
S96T001088	134:6A	Whole	< 9.060	< 9.49	< 9.28			

Table A-19. Tank 241-U-107 Analytical Results: Molydenum. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 24.60	< 23.0	< 23.8[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 23.70	< 24.6	< 24.2[QC:a]			
S96T001878		Lower ½	< 23.10	< 22.1	< 22.6[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	91.30	87.40	89.35	91.6	4.6	10.7
S96T000682	129:2	DL	85.20	85.70	85.45			
S96T001119	134:5B	DL	101	101.0	101.0			
S96T001121	134:6A	DL	9.460	9.560	9.510			
S96T002140	135:1	DL	86.30	84.40	85.35			
S96T002141	135:1R	DL	93.10	92.80	92.95			
S96T002142	135:2A	DL	84.30	82.50	83.40			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-20. Tank 241-U-107 Analytical Results: Neodymium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 46.50	< 43.4	< 45.0	< 55.3	N/A	< 119
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	< 53.20	< 54.8	< 54.0			
S96T002286		Lower ½	< 91.80	< 89.3	< 90.6			
S96T001086	134:5	A	< 54.60	< 60.4	< 57.5			
S96T001085		B	< 58.80	< 55.5	< 57.2			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-20. Tank 241-U-107 Analytical Results: Neodymium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-21. Tank 241-U-107 Analytical Results: Nickel. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	83.20	86.90	85.05	26.8	29.7	57.8
S96T000789		Lower ½	42.90	38.10	40.50			
S96T000790	129:3	Upper ½	< 9.880	< 8.61	< 9.25			
S96T000791		Lower ½	< 10.20	< 10.1	< 10.2			
S96T001152	129:3R	Upper ½	< 11.20	< 10.2	< 10.7			
S96T001080	134:2	Upper ½	< 11.90	< 10.1	< 11.0[QC:c]			
S96T002284		Upper ½	< 19.40	< 18.5	< 19.0			
S96T001081	134:3	Upper ½	< 11.30	< 11.7	< 11.5			
S96T002285		Upper ½	< 19.80	< 19.8	< 19.8			
S96T001083	134:4	A	27.50	23.90	25.70			
S96T002287		A	32.80	32.10	32.45			
S96T001084		B	27.30	31.30	29.30			
S96T002288		B	39.10	37.70	38.40			
S96T001082		Lower ½	58.20	55.60	56.90			
S96T002286		Lower ½	73.20	73.80	73.50			
S96T001086	134:5	A	66.60	114.0	90.30[QC:e]			
S96T001085		B	70.40	81.60	76.00			
S96T001087	134:5A	A	27.10	27.50	27.30			
S96T001088	134:6A	Whole	< 3.620	< 3.80	< 3.71			

Table A-21. Tank 241-U-107 Analytical Results: Nickel. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 9.830	< 9.21	< 9.52[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 9.480	< 9.84	< 9.66[QC:a]			
S96T001878		Lower ½	< 9.250	< 8.84	< 9.05[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	23.40	20.50	21.95	17.4	12.1	2.04
S96T000682	129:2	DL	22.10	< 20.0	21.1			
S96T001119	134:5B	DL	14.50	14.80	14.65			
S96T001121	134:6A	DL	1.760	1.560	1.660			
S96T002140	135:1	DL	15.50	15.30	15.40			
S96T002141	135:1R	DL	16.80	15.30	16.05			
S96T002142	135:2A	DL	18.80	13.50	16.15[QC:c]			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-22. Tank 241-U-107 Analytical Results: Phosphorus. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	6,380	5,800	6,090[QC:c]	2,720	53.1	5,870
S96T000789		Lower ½	926	1,660	1,290[QC:e]			
S96T000790	129:3	Upper ½	297	288.0	292.5			
S96T000791		Lower ½	348	318.0	333.0			
S96T001152	129:3R	Upper ½	434	392.0	413.0[QC:d]			
S96T001080	134:2	Upper ½	1,420	1,220	1,320[QC:e]			
S96T002284		Upper ½	1,560	1,420	1,490			
S96T001081	134:3	Upper ½	2,100	2,190	2,140			
S96T002285		Upper ½	1,410	2,670	2,040[QC:e]			
S96T001083	134:4	A	1,400	1,020	1,210[QC:e]			
S96T002287		A	1,810	1,390	1,600[QC:e]			
S96T001084		B	1,510	1,730	1,620			
S96T002288		B	1,930	1,760	1,840			
S96T001082		Lower ½	3,650	3,360	3,500			
S96T002286		Lower ½	4,410	4,260	4,340			
S96T001086	134:5	A	12,700	24,800	18,800[QC:e]			
S96T001085		B	16,400	15,800	16,100			
S96T001087	134:5A	A	11,200	10,800	11,000			
S96T001088	134:6A	Whole	226	228.0	227.0			
S96T002161	135:2A	Whole	1,160	1,080	1,120[QC:a]			

Table A-22. Tank 241-U-107 Analytical Results: Phosphorus. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001877	135:2R	Upper ½	669	1,000	834.5[QC:a,d,e]	Cont.	Cont.	Cont.
S96T001878		Lower ½	657	600.0	628.5[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	1,320	1,220	1,270[QC:c]	1,130	3.7	132
S96T000682	129:2	DL	995	989.0	992.0			
S96T001119	134:5B	DL	1,080	1,080	1,080			
S96T001121	134:6A	DL	44.10	44.10	44.10			
S96T002140	135:1	DL	1,230	1,230	1,230			
S96T002141	135:1R	DL	1,210	1,210	1,210[QC:c]			
S96T002142	135:2A	DL	1,170	1,150	1,160[QC:c]			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-23. Tank 241-U-107 Analytical Results: Potassium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	1,620	1,630	1,620	819	16.5	1,770
S96T000789		Lower ½	933	714.0	823.5[QC:e]			
S96T000790	129:3	Upper ½	926	850.0	888.0			
S96T000791		Lower ½	815	626.0	720.5[QC:e]			
S96T001152	129:3R	Upper ½	641	525.0	583.0			
S96T001080	134:2	Upper ½	591	465.0	528.0[QC:c,e]			
S96T002284		Upper ½	536	527.0	531.5[QC:c]			
S96T001081	134:3	Upper ½	684	814.0	749.0			
S96T002285		Upper ½	861	890.0	875.5			
S96T001083	134:4	A	1,200	1,190	1,200			
S96T002287		A	1,650	1,450	1,550			
S96T001084		B	1,480	1,430	1,460			
S96T002288		B	1,620	1,660	1,640			
S96T001082		Lower ½	1,690	1,580	1,640			
S96T002286		Lower ½	1,840	1,850	1,840			
S96T001086	134:5	A	593	875.0	734.0[QC:e]			
S96T001085		B	767	780.0	773.5			
S96T001087	134:5A	A	670	530.0	600.0[QC:e]			
S96T001088	134:6A	Whole	173	200.0	186.5			

Table A-23. Tank 241-U-107 Analytical Results: Potassium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	798	737.0	767.5[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	411	527.0	469.0[QC:a,e]			
S96T001878		Lower ½	530	485.0	507.5[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	2,980	2,840	2,910[QC:c]	3,150	7.6	369
S96T000682	129:2	DL	2,810	2,750	2,780			
S96T001119	134:5B	DL	3,640	3,630	3,640			
S96T001121	134:6A	DL	322	318.0	320.0[QC:d]			
S96T002140	135:1	DL	2,810	2,880	2,840			
S96T002141	135:1R	DL	3,210	3,050	3,130			
S96T002142	135:2A	DL	2,990	2,920	2,960			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-24. Tank 241-U-107 Analytical Results: Samarium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 46.50	< 43.4	< 45.0	< 55.3	N/A	< 119
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	< 98.90	< 98.9	< 98.9			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	< 101	< 89.7	< 95.4			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	< 83.80	< 87.3	< 85.6			
S96T001082		Lower ½	< 53.20	< 54.8	< 54.0			
S96T002286		Lower ½	< 91.80	< 89.3	< 90.6			
S96T001086	134:5	A	< 54.60	< 60.4	< 57.5			
S96T001085	134:5	B	< 58.80	< 55.5	< 57.2			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-24. Tank 241-U-107 Analytical Results: Samarium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3			
S96T001878	135:2R	Lower ½	< 46.20	< 44.2	< 45.2			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-25. Tank 241-U-107 Analytical Results: Selenium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 46.50	< 43.4	< 45.0	< 73.9	N/A	< 160
S96T000789		Lower ½	< 45.40	< 47.4	< 46.4			
S96T000790	129:3	Upper ½	< 49.40	< 43.0	< 46.2			
S96T000791		Lower ½	< 51.10	< 50.4	< 50.8			
S96T001152	129:3R	Upper ½	< 55.90	< 50.8	< 53.4			
S96T001080	134:2	Upper ½	< 59.40	< 50.6	< 55.0			
S96T002284		Upper ½	< 97.10	< 92.7	< 94.9			
S96T001081	134:3	Upper ½	< 56.50	< 58.5	< 57.5			
S96T002285		Upper ½	144	147.0	145.5			
S96T001083	134:4	A	< 60.00	< 57.4	< 58.7			
S96T002287		A	224	262.0	243.0			
S96T001084		B	< 53.00	< 53.4	< 53.2			
S96T002288		B	366	351.0	358.5			
S96T001082		Lower ½	< 53.20	< 54.8	< 54.0			
S96T002286		Lower ½	886	854.0	870.0			
S96T001086	134:5	A	< 54.60	< 60.4	< 57.5			
S96T001085		B	< 58.80	< 55.5	< 57.2			
S96T001087	134:5A	A	< 51.80	< 65.6	< 58.7			
S96T001088	134:6A	Whole	< 18.10	< 19.0	< 18.6			

Table A-25. Tank 241-U-107 Analytical Results: Selenium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 49.20	< 46.0	< 47.6[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 47.40	< 49.2	< 48.3[QC:a]			
S96T001878		Lower ½	< 46.20	< 44.2	< 45.2[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 100	< 100	< 100	< 73.4	N/A	< 8.59
S96T000682	129:2	DL	< 100	< 100	< 100			
S96T001119	134:5B	DL	< 60.10	< 60.1	< 60.1			
S96T001121	134:6A	DL	< 4.100	< 4.10	< 4.10			
S96T002140	135:1	DL	< 60.10	< 60.1	< 60.1			
S96T002141	135:1R	DL	< 60.10	< 60.1	< 60.1			
S96T002142	135:2A	DL	< 60.10	< 60.1	< 60.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-26. Tank 241-U-107 Analytical Results: Silicon. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	232	245.0	238.5[QC:b]	198	10.4	427
S96T000789		Lower ½	164	163.0	163.5[QC:b]			
S96T000790	129:3	Upper ½	70.70	57.60	64.15[QC:b,e]			
S96T000791		Lower ½	217	199.0	208.0[QC:b]			
S96T001152	129:3R	Upper ½	164	184.0	174.0[QC:b,c]			
S96T001080	134:2	Upper ½	139	119.0	129.0[QC:c,e]			
S96T002284		Upper ½	265	256.0	260.5[QC:b]			
S96T001081	134:3	Upper ½	78.50	82.10	80.30			
S96T002285		Upper ½	261	336.0	298.5[QC:b,e]			
S96T001083	134:4	A	48.40	74.30	61.35[QC:e]			
S96T002287		A	131	324.0	227.5[QC:b,e]			
S96T001084		B	93.00	103.0	98.00			
S96T002288		B	315	297.0	306.0[QC:b,c]			
S96T001082		Lower ½	131	154.0	142.5[QC:e]			
S96T002286		Lower ½	356	383.0	369.5[QC:b]			
S96T001086	134:5	A	249	397.0	323.0[QC:b,e]			
S96T001085		B	302	393.0	347.5[QC:b,c,e]			
S96T001087	134:5A	A	148	133.0	140.5[QC:b]			

Table A-26. Tank 241-U-107 Analytical Results: Silicon. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001088	134:6A	Whole	125	137.0	131.0[QC:b]	Cont.	Cont.	Cont.
S96T002161	135:2A	Whole	313	305.0	309.0[QC:a]			
S96T001877	135:2R	Upper ½	182	189.0	185.5[QC:a]			
S96T001878		Lower ½	128	123.0	125.5[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	85.50	77.00	81.25	164	23.4	19.2
S96T000682	129:2	DL	84.80	101.0	92.90[QC:e]			
S96T001119	134:5B	DL	210	185.0	197.5			
S96T001121	134:6A	DL	104	104.0	104.0[QC:d]			
S96T002140	135:1	DL	194	180.0	187.0			
S96T002141	135:1R	DL	112	111.0	111.5			
S96T002142	135:2A	DL	271	263.0	267.0			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-27. Tank 241-U-107 Analytical Results: Silver. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	13.40	13.20	13.30	14.7	6.3	31.7
S96T000789		Lower ½	14.80	14.80	14.80			
S96T000790	129:3	Upper ½	14.50	15.00	14.75			
S96T000791		Lower ½	15.20	15.00	15.10			
S96T001152	129:3R	Upper ½	15.90	14.70	15.30			
S96T001080	134:2	Upper ½	16.70	14.80	15.75[QC:c]			
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49			
S96T001081	134:3	Upper ½	15.30	16.50	15.90			
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89			
S96T001083	134:4	A	15.20	14.60	14.90			
S96T002287		A	< 10.10	< 8.97	< 9.54			
S96T001084		B	14.10	15.00	14.55			
S96T002288		B	42.80	15.80	29.30[QC:c,e]			
S96T001082		Lower ½	14.80	14.70	14.75			
S96T002286		Lower ½	< 9.180	< 8.93	< 9.06			
S96T001086	134:5	A	16.60	18.00	17.30			
S96T001085		B	13.00	13.70	13.35			
S96T001087	134:5A	A	13.70	12.60	13.15			
S96T001088	134:6A	Whole	< 1.810	< 1.90	< 1.86			

Table A-27. Tank 241-U-107 Analytical Results: Silver. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	14.30	14.50	14.40[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	16.20	16.30	16.25[QC:a]			
S96T001878		Lower ½	16.20	15.80	16.00[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	14.1	14.4	1.65
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	16.10	16.00	16.05[QC:c]			
S96T001121	134:6A	DL	1.330	1.280	1.305			
S96T002140	135:1	DL	15.20	15.20	15.20[QC:c]			
S96T002141	135:1R	DL	16.90	16.70	16.80[QC:c]			
S96T002142	135:2A	DL	16.90	15.50	16.20[QC:c]			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-28. Tank 241-U-107 Analytical Results: Sodium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	1.45E+05	1.44E+05	1.44E+05[QC:d]	2.01E+05	4.1	4.34E+05
S96T000789		Lower ½	1.86E+05	1.93E+05	1.90E+05			
S96T000790	129:3	Upper ½	1.99E+05	2.06E+05	2.02E+05			
S96T000791		Lower ½	2.15E+05	2.12E+05	2.14E+05			
S96T001152	129:3R	Upper ½	2.08E+05	2.03E+05	2.06E+05[QC:b,d]			
S96T001080	134:2	Upper ½	2.24E+05	1.92E+05	2.08E+05[QC:b,e]			
S96T002284		Upper ½	2.25E+05	2.20E+05	2.22E+05			
S96T001081	134:3	Upper ½	2.01E+05	2.09E+05	2.05E+05[QC:b]			
S96T002285		Upper ½	2.19E+05	2.06E+05	2.12E+05			
S96T001083	134:4	A	1.95E+05	1.91E+05	1.93E+05[QC:b]			
S96T002287		A	1.95E+05	2.04E+05	2.00E+05			
S96T001084		B	1.78E+05	1.92E+05	1.85E+05[QC:b]			
S96T002288		B	2.00E+05	1.95E+05	1.98E+05			
S96T001082		Lower ½	1.73E+05	1.68E+05	1.70E+05[QC:b]			
S96T002286		Lower ½	1.84E+05	1.82E+05	1.83E+05			
S96T001086	134:5	A	1.74E+05	1.54E+05	1.64E+05			
S96T001085		B	1.63E+05	1.73E+05	1.68E+05[QC:d]			
S96T001087	134:5A	A	1.81E+05	1.80E+05	1.80E+05			

Table A-28. Tank 241-U-107 Analytical Results: Sodium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001088	134:6A	Whole	13,200	14,400	13,800	Cont.	Cont.	Cont.
S96T002161	135:2A	Whole	2.06E+05	2.03E+05	2.04E+05			
S96T001877	135:2R	Upper ½	2.31E+05	2.29E+05	2.30E+05[QC:d]			
S96T001878		Lower ½	2.25E+05	2.23E+05	2.24E+05			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	2.31E+05	2.25E+05	2.28E+05	2.19E+05	1.8	25,600
S96T000682	129:2	DL	2.11E+05	2.14E+05	2.12E+05[QC:d]			
S96T001119	134:5B	DL	2.26E+05	2.25E+05	2.26E+05			
S96T001121	134:6A	DL	18,600	18,600	18,600			
S96T002140	135:1	DL	2.17E+05	2.15E+05	2.16E+05[QC:e]			
S96T002141	135:1R	DL	2.34E+05	2.33E+05	2.34E+05			
S96T002142	135:2A	DL	2.22E+05	2.19E+05	2.20E+05			
S95T000792	U-107-1 (Grab)	DL	2.06E+05	1.98E+05	2.02E+05			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-29. Tank 241-U-107 Analytical Results: Strontium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	5.570	5.900	5.735	< 5.96	N/A	< 12.9
S96T000789		Lower ½	< 4.540	< 4.74	< 4.64			
S96T000790	129:3	Upper ½	< 4.940	< 4.30	< 4.62			
S96T000791		Lower ½	< 5.110	< 5.04	< 5.08			
S96T001152	129:3R	Upper ½	< 5.590	< 5.08	< 5.34			
S96T001080	134:2	Upper ½	< 5.940	< 5.06	< 5.50			
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49			
S96T001081	134:3	Upper ½	< 5.650	< 5.85	< 5.75			
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89			
S96T001083	134:4	A	< 6.000	< 5.74	< 5.87			
S96T002287		A	< 10.10	< 8.97	< 9.54			
S96T001084		B	< 5.300	< 5.34	< 5.32			
S96T002288		B	< 8.380	< 8.73	< 8.56			
S96T001082		Lower ½	< 5.320	< 5.48	< 5.40			
S96T002286		Lower ½	< 9.180	< 8.93	< 9.06			
S96T001086	134:5	A	11.70	19.50	15.60[QC:e]			
S96T001085		B	7.440	7.740	7.590			
S96T001087	134:5A	A	< 5.180	< 6.56	< 5.87			
S96T001088	134:6A	Whole	< 1.810	< 1.90	< 1.86			

Table A-29. Tank 241-U-107 Analytical Results: Strontium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 4.920	< 4.60	< 4.76	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 4.740	< 4.92	< 4.83			
S96T001878		Lower ½	< 4.620	< 4.42	< 4.52			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	< 7.34	N/A	< 0.859
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01			
S96T001121	134:6A	DL	< 0.410	< 0.410	< 0.410			
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01			
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01			
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-30. Tank 241-U-107 Analytical Results: Sulfur. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	1,260	1,290	1,280	721	23.5	1,560
S96T000789		Lower ½	747	582.0	664.5[QC:e]			
S96T000790	129:3	Upper ½	718	649.0	683.5			
S96T000791		Lower ½	609	532.0	570.5			
S96T001152	129:3R	Upper ½	456	431.0	443.5			
S96T001080	134:2	Upper ½	543	463.0	503.0[QC:e]			
S96T002284		Upper ½	929	769.0	849.0[QC:e]			
S96T001081	134:3	Upper ½	1,230	1,270	1,250			
S96T002285		Upper ½	1,730	1,440	1,580			
S96T001083	134:4	A	1,770	1,830	1,800			
S96T002287		A	2,000	2,150	2,080			
S96T001084		B	1,720	1,840	1,780			
S96T002288		B	2,020	1,920	1,970			
S96T001082		Lower ½	1,520	1,430	1,480			
S96T002286		Lower ½	1,720	1,620	1,670			
S96T001086	134:5	A	279	489.0	384.0[QC:e]			
S96T001085		B	516	517.0	516.5			
S96T001087	134:5A	A	461	416.0	438.5			
S96T001088	134:6A	Whole	90.50	100.0	95.25			

Table A-30. Tank 241-U-107 Analytical Results: Sulfur. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	542	513.0	527.5	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	172	177.0	174.5			
S96T001878		Lower ½	227	227.0	227.0			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	2,550	2,420	2,480	2,110	14.8	247
S96T000682	129:2	DL	2,340	2,330	2,340			
S96T001119	134:5B	DL	1,500	1,470	1,480			
S96T001121	134:6A	DL	131	141.0	136.0[QC:d]			
S96T002140	135:1	DL	2,380	2,340	2,360			
S96T002141	135:1R	DL	2,590	2,570	2,580[QC:e]			
S96T002142	135:2A	DL	2,430	2,420	2,420			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-31. Tank 241-U-107 Analytical Results: Thallium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 93.00	< 86.7	< 89.9	< 111	N/A	< 240
S96T000789		Lower ½	< 90.80	< 94.8	< 92.8			
S96T000790	129:3	Upper ½	< 98.80	< 86.1	< 92.5			
S96T000791		Lower ½	< 102	< 101	< 102			
S96T001152	129:3R	Upper ½	< 112	< 102	< 107			
S96T001080	134:2	Upper ½	< 119	< 101	< 110[QC:e]			
S96T002284		Upper ½	< 194	< 185	< 190			
S96T001081	134:3	Upper ½	< 113	< 117	< 115			
S96T002285		Upper ½	< 198	< 198	< 198			
S96T001083	134:4	A	< 120	< 115	< 118			
S96T002287		A	< 202	< 179	< 191			
S96T001084		B	< 106	< 107	< 107			
S96T002288		B	< 168	< 175	< 172			
S96T001082		Lower ½	< 106	< 110	< 108			
S96T002286		Lower ½	< 184	< 179	< 182			
S96T001086	134:5	A	< 109	< 121	< 115			
S96T001085		B	< 118	< 111	< 115			
S96T001087	134:5A	A	< 104	< 131	< 118			
S96T001088	134:6A	Whole	< 36.20	< 38.0	< 37.1			

Table A-31. Tank 241-U-107 Analytical Results: Thallium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 98.30	< 92.1	< 95.2[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 94.80	< 98.4	< 96.6[QC:a]			
S96T001878		Lower ½	< 92.50	< 88.4	< 90.5[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 200	< 200	< 200	< 147	N/A	< 17.2
S96T000682	129:2	DL	< 200	< 200	< 200			
S96T001119	134:5B	DL	< 120	< 120	< 120			
S96T001121	134:6A	DL	< 8.200	< 8.20	< 8.20			
S96T002140	135:1	DL	< 120	< 120	< 120			
S96T002141	135:1R	DL	< 120	< 120	< 120			
S96T002142	135:2A	DL	< 120	< 120	< 120			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-32. Tank 241-U-107 Analytical Results: Titanium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	5.160	5.530	5.345	< 6.07	N/A	< 13.1
S96T000789		Lower ½	< 4.540	< 4.74	< 4.64			
S96T000790	129:3	Upper ½	< 4.940	< 4.30	< 4.62			
S96T000791		Lower ½	< 5.110	< 5.04	< 5.08			
S96T001152	129:3R	Upper ½	< 5.590	< 5.08	< 5.34			
S96T001080	134:2	Upper ½	< 5.940	< 5.06	< 5.50[QC:e]			
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49			
S96T001081	134:3	Upper ½	< 5.650	< 5.85	< 5.75			
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89			
S96T001083	134:4	A	< 6.000	< 5.74	< 5.87			
S96T002287		A	< 10.10	< 8.97	< 9.54			
S96T001084		B	< 5.300	< 5.34	< 5.32			
S96T002288		B	< 8.380	< 8.73	< 8.56			
S96T001082		Lower ½	5.700	6.010	5.855			
S96T002286		Lower ½	< 9.180	< 8.93	< 9.06			
S96T001086	134:5	A	14.30	21.60	17.95[QC:e]			
S96T001085		B	9.140	8.890	9.015			
S96T001087	134:5A	A	< 5.180	< 6.56	< 5.87			
S96T001088	134:6A	Whole	< 1.810	< 1.90	< 1.86			

Table A-32. Tank 241-U-107 Analytical Results: Titanium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 4.920	5.19	5.06[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 4.740	< 4.92	< 4.83[QC:a]			
S96T001878		Lower ½	< 4.620	< 4.42	< 4.52[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	< 7.34	N/A	< 0.859
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01			
S96T001121	134:6A	DL	< 0.410	< 0.410	< 0.410			
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01			
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01			
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-33. Tank 241-U-107 Analytical Results: Uranium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	315	355.0	335.0	< 299	N/A	< 645
S96T000789		Lower ½	< 227	< 237	< 232			
S96T000790	129:3	Upper ½	< 247	< 215	< 231			
S96T000791		Lower ½	< 255	< 252	< 254			
S96T001152	129:3R	Upper ½	< 279	< 254	< 267[QC:e]			
S96T001080	134:2	Upper ½	< 297	< 253	< 275[QC:e]			
S96T002284		Upper ½	< 485	< 464	< 475			
S96T001081	134:3	Upper ½	< 283	< 293	< 288			
S96T002285		Upper ½	< 494	< 495	< 495			
S96T001083	134:4	A	< 300	< 287	< 294			
S96T002287		A	< 504	< 448	< 476			
S96T001084		B	< 265	< 267	< 266			
S96T002288		B	< 419	< 436	< 428			
S96T001082		Lower ½	< 266	< 274	< 270			
S96T002286		Lower ½	< 459	< 447	< 453			
S96T001086	134:5	A	554	880.0	717.0[QC:e]			
S96T001085		B	333	334.0	333.5			
S96T001087	134:5A	A	< 259	< 328	< 294			
S96T001088	134:6A	Whole	< 90.60	< 94.9	< 92.8			

Table A-33. Tank 241-U-107 Analytical Results: Uranium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 246	< 230	< 238[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 237	< 246	< 242[QC:a]			
S96T001878		Lower ½	< 231	< 221	< 226[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 500	< 500	< 500	< 367	N/A	< 42.9
S96T000682	129:2	DL	< 500	< 500	< 500			
S96T001119	134:5B	DL	< 300	< 300	< 300			
S96T001121	134:6A	DL	< 20.50	< 20.5	< 20.5			
S96T002140	135:1	DL	< 300	< 300	< 300			
S96T002141	135:1R	DL	< 300	< 300	< 300			
S96T002142	135:2A	DL	< 300	< 300	< 300			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-34. Tank 241-U-107 Analytical Results: Vanadium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	< 23.30	< 21.7	< 22.5	< 27.7	N/A	< 59.8
S96T000789		Lower ½	< 22.70	< 23.7	< 23.2			
S96T000790	129:3	Upper ½	< 24.70	< 21.5	< 23.1			
S96T000791		Lower ½	< 25.50	< 25.2	< 25.4			
S96T001152	129:3R	Upper ½	< 27.90	< 25.4	< 26.7			
S96T001080	134:2	Upper ½	< 29.70	< 25.3	< 27.5[QC:c]			
S96T002284		Upper ½	< 48.50	< 46.4	< 47.5			
S96T001081	134:3	Upper ½	< 28.30	< 29.3	< 28.8			
S96T002285		Upper ½	< 49.40	< 49.5	< 49.5			
S96T001083	134:4	A	< 30.00	< 28.7	< 29.4			
S96T002287		A	< 50.40	< 44.8	< 47.6			
S96T001084		B	< 26.50	< 26.7	< 26.6			
S96T002288		B	< 41.90	< 43.6	< 42.8			
S96T001082		Lower ½	< 26.60	< 27.4	< 27.0			
S96T002286		Lower ½	< 45.90	< 44.7	< 45.3			
S96T001086	134:5	A	< 27.30	< 30.2	< 28.8			
S96T001085		B	< 29.40	< 27.8	< 28.6			
S96T001087	134:5A	A	< 25.90	< 32.8	< 29.4			
S96T001088	134:6A	Whole	< 9.060	< 9.49	< 9.28			

Table A-34. Tank 241-U-107 Analytical Results: Vanadium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 24.60	< 23.0	< 23.8[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 23.70	< 24.6	< 24.2[QC:a]			
S96T001878		Lower ½	< 23.10	< 22.1	< 22.6[QC:a]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 50.00	< 50.0	< 50.0	< 36.7	N/A	< 4.29
S96T000682	129:2	DL	< 50.00	< 50.0	< 50.0			
S96T001119	134:5B	DL	< 30.10	< 30.1	< 30.1			
S96T001121	134:6A	DL	< 2.050	< 2.05	< 2.05			
S96T002140	135:1	DL	< 30.10	< 30.1	< 30.1			
S96T002141	135:1R	DL	< 30.10	< 30.1	< 30.1			
S96T002142	135:2A	DL	< 30.10	< 30.1	< 30.1			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-35. Tank 241-U-107 Analytical Results: Zinc. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	53.50	59.60	56.55	29.2	29.4	63.0
S96T000789		Lower ½	39.00	30.10	34.55[QC:e]			
S96T000790	129:3	Upper ½	16.20	15.90	16.05			
S96T000791		Lower ½	16.40	15.50	15.95			
S96T001152	129:3R	Upper ½	13.50	41.30	27.40[QC:e]			
S96T001080	134:2	Upper ½	13.90	12.30	13.10[QC:e]			
S96T002284		Upper ½	11.50	11.20	11.35			
S96T001081	134:3	Upper ½	15.30	16.00	15.65			
S96T002285		Upper ½	17.60	14.40	16.00			
S96T001083	134:4	A	17.70	16.20	16.95			
S96T002287		A	13.50	16.60	15.05[QC:e]			
S96T001084		B	15.80	19.80	17.80[QC:e]			
S96T002288		B	37.10	21.60	29.35[QC:e]			
S96T001082		Lower ½	42.00	41.60	41.80			
S96T002286		Lower ½	50.60	47.00	48.80			
S96T001086	134:5	A	90.30	138.0	114.2[QC:e]			
S96T001085		B	83.90	85.40	84.65			
S96T001087	134:5A	A	54.60	45.60	50.10			
S96T001088	134:6A	Whole	12.00	13.60	12.80			

Table A-35. Tank 241-U-107 Analytical Results: Zinc. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	27.50	22.80	25.15[QC:a]	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	16.70	17.50	17.10[QC:a]			
S96T001878		Lower ½	21.20	14.40	17.80[QC:a,e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10:0	< 10.0	17.2	13.1	2.01
S96T000682	129:2	DL	27.30	27.40	27.35			
S96T001119	134:5B	DL	15.20	15.00	15.10			
S96T001121	134:6A	DL	3.010	3.430	3.220			
S96T002140	135:1	DL	18.60	18.60	18.60			
S96T002141	135:1R	DL	17.20	16.50	16.85			
S96T002142	135:2A	DL	18.30	18.00	18.15			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-36. Tank 241-U-107 Analytical Results: Zirconium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000788	129:2	Upper ½	17.40	18.20	17.80[QC:a,c]	< 7.61	N/A	< 16.4
S96T000789		Lower ½	10.10	10.10	10.10[QC:a]			
S96T000790	129:3	Upper ½	< 4.940	< 4.30	< 46.2[QC:a]			
S96T000791		Lower ½	< 5.110	< 5.04	< 5.08[QC:a]			
S96T001152	129:3R	Upper ½	< 5.590	< 5.08	< 5.34			
S96T001080	134:2	Upper ½	< 5.940	< 5.06	< 5.50			
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49			
S96T001081	134:3	Upper ½	< 5.650	< 5.85	< 5.75			
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89			
S96T001083	134:4	A	< 6.000	< 5.74	< 5.87			
S96T002287		A	< 10.10	< 8.97	< 9.54			
S96T001084		B	< 5.300	< 5.34	< 5.32			
S96T002288		B	< 8.380	< 8.73	< 8.56			
S96T001082		Lower ½	7.950	7.310	7.630			
S96T002286		Lower ½	9.360	11.00	10.18			
S96T001086	134:5	A	18.10	20.00	19.05			
S96T001085		B	11.80	7.030	9.415[QC:c,e]			
S96T001087	134:5A	A	< 5.180	< 6.56	< 5.87			
S96T001088	134:6A	Whole	< 1.810	< 1.90	< 1.86			

Table A-36. Tank 241-U-107 Analytical Results: Zirconium. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T002161	135:2A	Whole	< 4.920	< 4.60	< 4.76	Cont.	Cont.	Cont.
S96T001877	135:2R	Upper ½	< 4.740	< 4.92	< 4.83			
S96T001878		Lower ½	< 4.620	< 4.42	< 4.52			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0	< 7.34	N/A	< 0.859
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0			
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01			
S96T001121	134:6A	DL	< 0.410	< 0.410	< 0.410			
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01			
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01			
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-37. Tank 241-U-107 Analytical Results: Chloride. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	4,600	4,540	4,570	2,320	19.0	5,010
S96T000691		Lower ½	2,070	1,780	1,920[QC:e]			
S96T000692	129:3	Upper ½	2,240	2,660	2,450[QC:e]			
S96T000693		Lower ½	3,730	2,180	2,950[QC:e]			
S96T001144	129:3R	Upper ½	2,350	1,540	1,950[QC:e]			
S96T001071	134:2	Upper ½	1,410	1,300	1,360			
S96T001072	134:3	Upper ½	2,260	2,400	2,330			
S96T001074	134:4	A	3,090	4,030	3,560[QC:e]			
S96T001075		B	5,180	5,270	5,220			
S96T001073		Lower ½	5,860	5,890	5,880[QC:d]			
S96T001077	134:5	A	3,390	5,890	4,640[QC:e]			
S96T001076		B	3,380	2,870	3,120[QC:e]			
S96T001078	134:5A	A	2,880	2,920	2,900			
S96T001079	134:6A	Whole	978	991.0	984.5			
S96T002160	135:2A	Whole	1,950	1,900	1,930			
S96T001875	135:2R	Upper ½	572	571.0	571.3			
S96T001876		Lower ½	595	914.0	754.5[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	7,200	7,330	7,260	7,900	4.3	924
S96T000682	129:2	DL	7,740	7,670	7,710			
S96T001119	134:5B	DL	8,810	8,940	8,870			

Table A-37. Tank 241-U-107 Analytical Results: Chloride. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids (Cont.)			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001121	134:6A	DL	786	781.0	783.6	Cont.	Cont.	Cont.
S96T002140	135:1	DL	9,070	7,650	8,360[QC:c]			
S96T002141	135:1R	DL	9,320	9,720	9,520			
S96T002142	135:2A	DL	7,580	7,660	7,620			
S95T000792	U-107-1 (Grab)	DL	6,880	7,060	6,970			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-38. Tank 241-U-107 Analytical Results: Fluoride. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	467	416.0	441.5[QC:c]	< 262	N/A	< 566
S96T000691		Lower ½	300	291.0	295.6			
S96T000692	129:3	Upper ½	652	683.0	667.5			
S96T000693		Lower ½	< 168	< 162	< 165			
S96T001144	129:3R	Upper ½	< 236	< 231	< 234			
S96T001071	134:2	Upper ½	< 239	< 239	< 239			
S96T001072	134:3	Upper ½	< 268	< 276	< 272			

Table A-38. Tank 241-U-107 Analytical Results: Fluoride. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001074	134:4	A	< 122	< 128	< 125	Cont.	Cont.	Cont.
S96T001075		B	< 145	< 135	< 140			
S96T001073		Lower ½	566	588.0	577.0			
S96T001077	134:5	A	492	470.0	480.9			
S96T001076		B	378	319.0	348.2[QC:e]			
S96T001078	134:5A	A	581	878.0	729.4[QC:e]			
S96T001079	134:6A	Whole	< 16.49	< 16.3	< 16.4[QC:e]			
S96T002160	135:2A	Whole	< 97.62	< 100	< 98.8			
S96T001875	135:2R	Upper ½	< 97.83	< 101	< 99.4			
S96T001876		Lower ½	< 91.06	< 92.5	< 91.8			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	458	451.0	454.5	< 229	N/A	< 26.8
S96T000682	129:2	DL	499	496.0	497.5			
S96T001119	134:5B	DL	< 66.96	< 67.0	< 67.0[QC:e]			
S96T001121	134:6A	DL	< 27.57	< 27.6	< 27.6			
S96T002140	135:1	DL	< 53.83	< 53.8	< 53.8			
S96T002141	135:1R	DL	< 53.83	< 53.8	< 53.8			
S96T002142	135:2A	DL	< 53.83	< 53.8	< 53.8			
S95T000792	U-107-1 (Grab)	DL	< 248	< 248	< 248			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-39. Tank 241-U-107 Analytical Results: Hydroxide.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	27,500	29,100	28,300	26,600	2.9	3,110
S96T000682	129:2	DL	25,000	24,700	24,800			
S96T001119	134:5B	DL	25,900	25,600	25,800			
S96T001121	134:6A	DL	4,600	4,430	4,520			
S96T002140	135:1	DL	25,200	24,900	25,000			
S96T002141	135:1R	DL	22,700	28,100	25,400[QC:e]			
S96T002142	135:2A	DL	25,100	25,800	25,400			
S95T000792	U-107-1 (Grab)	DL	29,300	30,600	30,000			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-40. Tank 241-U-107 Analytical Results: Nitrate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	1.35E+05	1.27E+05	1.31E+05	4.81E+05	12.4	1.04E+06
S96T000691		Lower ½	3.18E+05	5.71E+05	4.44E+05[QC:e]			
S96T000692	129:3	Upper ½	5.66E+05	5.27E+05	5.47E+05			
S96T000693		Lower ½	5.00E+05	5.43E+05	5.21E+05			
S96T001144	129:3R	Upper ½	6.71E+05	6.72E+05	6.72E+05[QC:e]			
S96T001071	134:2	Upper ½	6.50E+05	6.44E+05	6.47E+05			
S96T001072	134:3	Upper ½	5.53E+05	5.35E+05	5.44E+05			
S96T001074	134:4	A	2.78E+05	4.17E+05	3.47E+05[QC:e]			
S96T001075		B	3.40E+05	3.68E+05	3.54E+05[QC:d]			
S96T001073		Lower ½	2.53E+05	2.57E+05	2.55E+05			
S96T001077	134:5	A	2.20E+05	2.51E+05	2.35E+05			
S96T001076		B	2.64E+05	2.49E+05	2.57E+05			
S96T001078	134:5A	A	4.74E+05	4.74E+05	4.74E+05			
S96T001079	134:6A	Whole	14,200	15,000	14,600			
S96T002160	135:2A	Whole	5.23E+05	4.94E+05	5.09E+05			
S96T001875	135:2R	Upper ½	6.11E+05	6.20E+05	6.15E+05[QC:e]			
S96T001876		Lower ½	4.73E+05	5.95E+05	5.34E+05[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	2.04E+05	2.09E+05	2.06E+05	2.38E+05	14.0	27,800
S96T000682	129:2	DL	2.21E+05	2.21E+05	2.21E+05			
S96T001119	134:5B	DL	2.27E+05	2.25E+05	2.26E+05[QC:e]			

Table A-40. Tank 241-U-107 Analytical Results: Nitrate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids (Cont.)			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001121	134:6A	DL	11,200	11,500	11,400	Cont.	Cont.	Cont.
S96T002140	135:1	DL	4.65E+05	4.64E+05	4.65E+05			
S96T002141	135:1R	DL	2.37E+05	2.37E+05	2.37E+05			
S96T002142	135:2A	DL	2.23E+05	2.22E+05	2.23E+05[QC:d]			
S95T000792	U-107-1 (Grab)	DL	1.99E+05	2.00E+05	2.00E+05			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-41. Tank 241-U-107 Analytical Results: Nitrite. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	51,500	49,200	50,300	25,100	18.6	54,200
S96T000691		Lower ½	22,800	20,400	21,600			
S96T000692	129:3	Upper ½	27,800	31,800	29,800			
S96T000693		Lower ½	27,700	27,000	27,400			
S96T001144	129:3R	Upper ½	16,900	18,000	17,400			
S96T001071	134:2	Upper ½	16,200	16,200	16,200			
S96T001072	134:3	Upper ½	23,700	25,600	24,700			
S96T001074	134:4	A	34,100	45,000	39,600[QC:e]			
S96T001075		B	55,900	57,200	56,600			
S96T001073		Lower ½	62,300	63,900	63,100			
S96T001077	134:5	A	35,900	32,200	34,100			
S96T001076		B	35,700	30,500	33,100[QC:e]			
S96T001078	134:5A	A	30,900	30,300	30,600			
S96T001079	134:6A	Whole	9,600	9,530	9,570			
S96T002160	135:2A	Whole	23,200	22,300	22,800			
S96T001875	135:2R	Upper ½	7,780	7,740	7,760			
S96T001876		Lower ½	7,450	10,800	9,130[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	88,300	89,400	88,800	96,200	4.3	11,300
S96T000682	129:2	DL	94,000	93,800	93,900			
S96T001119	134:5B	DL	1.06E+05	1.09E+05	1.08E+05			

Table A-41. Tank 241-U-107 Analytical Results: Nitrite. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids (Cont.)			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T001121	134:6A	DL	8,300	8,190	8,240	Cont.	Cont.	Cont.
S96T002140	135:1	DL	1.14E+05	96,300	1.05E+05[QC:c]			
S96T002141	135:1R	DL	1.14E+05	1.16E+05	1.15E+05			
S96T002142	135:2A	DL	90,900	91,100	91,000[QC:d]			
S95T000792	U-107-1 (Grab)	DL	84,900	85,700	85,300			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-42. Tank 241-U-107 Analytical Results: Oxalate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	9,870	8,920	9,400	3,120	28.5	6,730
S96T000691		Lower ½	2,920	2,780	2,850			
S96T000692	129:3	Upper ½	1,960	< 1,330	1,650			
S96T000693		Lower ½	< 1,350	< 1,310	< 1,330			
S96T001144	129:3R	Upper ½	2,440	2,520	2,480			
S96T001071	134:2	Upper ½	< 1,930	2,580	2,260			
S96T001072	134:3	Upper ½	3,110	3,480	3,300			

Table A-42. Tank 241-U-107 Analytical Results: Oxalate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001074	134:4	A	2,180	3,030	2,600[QC:e]	Cont.	Cont.	Cont.
S96T001075		B	3,000	2,990	2,990			
S96T001073		Lower ½	5,990	6,170	6,080			
S96T001077	134:5	A	15,700	14,800	15,300			
S96T001076		B	9,930	8,160	9,050			
S96T001078	134:5A	A	1,890	2,070	1,980			
S96T001079	134:6A	Whole	< 133	< 132	< 133			
S96T002160	135:2A	Whole	< 788	< 810	< 799			
S96T001875	135:2R	Upper ½	932	< 814	873			
S96T001876		Lower ½	762	886.0	824.1			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	566	687.0	626.4	1,070	47.3	125
S96T000682	129:2	DL	530	518.0	524.2			
S96T001119	134:5B	DL	< 541	< 541	< 541			
S96T001121	134:6A	DL	< 223	< 223	< 223			
S96T002140	135:1	DL	575	505.0	540.1			
S96T002141	135:1R	DL	555	637.0	596.1			
S96T002142	135:2A	DL	3,440	3,780	3,610			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-43. Tank 241-U-107 Analytical Results: Phosphate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	32,100	26,300	29,200[QC:e]	12,300	39.5	26,500
S96T000691		Lower ½	7,120	6,960	7,040			
S96T000692	129:3	Upper ½	7,860	8,480	8,170			
S96T000693		Lower ½	7,250	6,840	7,050			
S96T001144	129:3R	Upper ½	< 2,150	7,570	4,860			
S96T001071	134:2	Upper ½	11,600	12,000	11,800			
S96T001072	134:3	Upper ½	13,400	14,300	13,800			
S96T001074	134:4	A	5,330	6,160	5,740			
S96T001075		B	8,260	8,750	8,510			
S96T001073		Lower ½	13,600	14,500	14,100			
S96T001077	134:5	A	67,000	59,100	63,000			
S96T001076		B	60,300	49,700	55,000[QC:e]			
S96T001078	134:5A	A	43,100	40,400	41,700			
S96T001079	134:6A	Whole	779	832.0	805.3			
S96T002160	135:2A	Whole	3,700	3,830	3,760			
S96T001875	135:2R	Upper ½	2,200	2,460	2,330			
S96T001876		Lower ½	1,060	2,150	1,600[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	3,530	3,740	3,640	3,830	15.8	448
S96T000682	129:2	DL	3,700	3,480	3,590			
S96T001119	134:5B	DL	2,900	3,080	2,990			
S96T001121	134:6A	DL	< 252	< 252	< 252			
S96T002140	135:1	DL	4,050	3,030	3,540[QC:e]			

Table A-43. Tank 241-U-107 Analytical Results: Phosphate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids (Cont.)			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T002141	135:1R	DL	3,730	4,650	4,190[QC:e]	Cont.	Cont.	Cont.
S96T002142	135:2A	DL	6,290	6,540	6,420			
S95T000792	U-107-1 (Grab)	DL	< 2,480	< 2,480	< 2,480			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-44. Tank 241-U-107 Analytical Results: Sulfate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T000690	129:2	Upper ½	4,950	5,030	4,990	4,490	27.5	9,690
S96T000691		Lower ½	4,650	4,880	4,760			
S96T000692	129:3	Upper ½	6,220	6,410	6,310			
S96T000693		Lower ½	6,440	6,010	6,230			
S96T001144	129:3R	Upper ½	5,910	5,720	5,820			
S96T001071	134:2	Upper ½	6,310	6,350	6,330			
S96T001072	134:3	Upper ½	8,860	10,000	9,430			

Table A-44. Tank 241-U-107 Analytical Results: Sulfate. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg/g	µg/g	µg/g	µg/g	%	kg
S96T001074	134:4	A	6,600	7,910	7,250[QC:e]	Cont.	Cont.	Cont.
S96T001075		B	7,550	7,750	7,650			
S96T001073		Lower ½	7,050	7,050	7,050			
S96T001077	134:5	A	2,520	2,960	2,740[QC:e]			
S96T001076		B	3,790	3,510	3,650			
S96T001078	134:5A	A	4,080	3,830	3,950			
S96T001079	134:6A	Whole	592	550.0	570.9			
S96T002160	135:2A	Whole	1,870	2,010	1,940			
S96T001875	135:2R	Upper ½	< 1,020	< 1,050	< 1,040			
S96T001876		Lower ½	962	1,160	1,060[QC:e]			
Liquids			µg/mL	µg/mL	µg/mL	µg/mL	%	kg
S96T000665	129:1	DL	5,940	6,180	6,060	6,390	13.4	748
S96T000682	129:2	DL	6,370	6,280	6,330			
S96T001119	134:5B	DL	3,280	3,170	3,230			
S96T001121	134:6A	DL	662	639.0	650.5			
S96T002140	135:1	DL	7,250	5,920	6,580[QC:e]			
S96T002141	135:1R	DL	7,020	7,330	7,180			
S96T002142	135:2A	DL	9,300	9,420	9,360			
S95T000792	U-107-1 (Grab)	DL	6,420	6,560	6,490			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-45. Tank 241-U-107 Analytical Results: Americium-241.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002134	135:1	Upper ½	< 0.912	< 0.846	< 0.879	< 0.592	N/A	< 1,280
S96T002135	135:1R	Whole	< 0.513	< 0.509	< 0.511			
S96T002136	135:2A	Whole	< 0.484	< 0.491	< 0.488			
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T002140	135:1	DL	< 1.032	< 1.04	< 1.04	< 0.680	N/A	< 79.6
S96T002141	135:1R	DL	< 2.072	< 2.07	< 2.07			
S96T002142	135:2A	DL	< 1.169	< 1.16	< 1.16			
S95T000792	U-107-1 (Grab)	DL	< 0.00250	0.00110	0.00180			

Table A-46. Tank 241-U-107 Analytical Results: Cesium-137.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002134	135:1	Upper ½	122	104.0	113.1	76.8	19.4	1.66E+05
S96T002135	135:1R	Whole	72.32	67.70	70.01			
S96T002136	135:2A	Whole	62.33	61.80	62.06			
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T002140	135:1	DL	280	283.0	281.5	338	19.0	39,500
S96T002141	135:1R	DL	565	571.0	568.0			
S96T002142	135:2A	DL	287	276.0	281.5			
S95T000792	U-107-1 (Grab)	DL	328	317	323			

Table A-47. Tank 241-U-107 Analytical Results: Cobalt-60.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002134	135:1	Upper ½	< 0.0253	< 0.0321	< 0.0287	< 0.0182	N/A	< 39.3
S96T002135	135:1R	Whole	< 0.0130	< 0.0137	< 0.0134			
S96T002136	135:2A	Whole	< 0.0142	< 0.0165	< 0.0154			
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T002140	135:1	DL	< 0.0132	< 0.0156	< 0.0144	< 0.0196	N/A	< 2.29
S96T002141	135:1R	DL	< 0.0328	< 0.0293	< 0.0311			
S96T002142	135:2A	DL	< 0.0166	< 0.0163	< 0.0165			

Table A-48. Tank 241-U-107 Analytical Results: Europium-154. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002134	135:1	Upper ½	< 0.110	< 0.117	< 0.114	< 0.0677	N/A	< 45.9
S96T002135	135:1R	Whole	< 0.0347	< 0.0436	< 0.0392			
S96T002136	135:2A	Whole	< 0.0436	< 0.0560	< 0.0498			
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T002140	135:1	DL	< 0.0561	< 0.0566	< 0.0564	< 0.0768	N/A	< 9.0
S96T002141	135:1R	DL	< 0.126	< 0.0991	< 0.113			
S96T002142	135:2A	DL	< 0.0644	< 0.0578	< 0.0611			

Table A-49. Tank 241-U-107 Analytical Results: Europium-155.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T002134	135:1	Upper ½	< 0.346	< 0.327	< 0.337	< 0.227	N/A	< 490
S96T002135	135:1R	Whole	< 0.200	< 0.193	< 0.197			
S96T002136	135:2A	Whole	< 0.182	< 0.189	< 0.186			
Liquids			µCi/mL	µCi/mL	µCi/Ml	µCi/mL	%	Ci
S96T002140	135:1	DL	< 0.513	< 0.514	< 0.514	< 0.708	N/A	< 82.9
S96T002141	135:1R	DL	< 1.030	< 1.03	< 1.03			
S96T002142	135:2A	DL	< 0.583	< 0.574	< 0.579			

Table A-50. Tank 241-U-107 Analytical Results: Plutonium-239/240.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T002140	135:1	DL	4.28E-05	5.89E-05	5.09E-05[QC:e]	4.78E-05	8.9	0.00559
S96T002141	135:1R	DL	3.84E-05	4.10E-05	3.97E-05			
S96T002142	135:2A	DL	5.49E-05	5.61E-05	5.55E-05			
S95T000792	U-107-1 (Grab)	DL	< 6.24E-05	< 2.80E-05	< 4.52E-05			

Table A-51. Tank 241-U-107 Analytical Results: Strontium-89/90.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T000665	129:1	DL	0.457	0.457	0.457	0.413	26.5	48.3
S96T000682	129:2	DL	0.408	0.386	0.397			
S96T001119	134:5B	DL	0.751	0.753	0.752			
S96T001121	134:6A	DL	0.0133	0.0135	0.0134			
S96T002140	135:1	DL	0.489	0.477	0.483			
S96T002141	135:1R	DL	0.124	0.112	0.118			
S96T002142	135:2A	DL	0.104	0.116	0.110			
S95T000792	U-107-1 (Grab)	DL	0.476	0.442	0.459			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-52. Tank 241-U-107 Analytical Results: Total Alpha. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T000684	129:1	Lower ½	0.00243	< 0.00512	0.00378	0.102	38.6	220
S96T000687	129:2	Lower ½	0.154	0.170	0.162			
S96T000689	129:3	Lower ½	0.0336	0.0371	0.0353[QC:c]			

Table A-52. Tank 241-U-107 Analytical Results: Total Alpha. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids (Cont.)			µCi/g	µCi/g	µCi/g	µCi/g	%	Ci
S96T001153	129:3R	Upper ½	0.0464	0.0322	0.0393[QC:c,e]	Cont.	Cont.	Cont.
S96T001089	134:2	Upper ½	0.0153	0.0203	0.0178[QC:b,c,e]			
S96T001090	134:3	Upper ½	0.0274	0.0403	0.0339[QC:b,e]			
S96T001092	134:4	A	0.0761	0.0751	0.0756[QC:b]			
S96T001093		B	0.0965	0.0980	0.0973[QC:b]			
S96T001091		Lower ½	0.285	0.319	0.302[QC:e]			
S96T001095	134:5	A	0.910	0.609	0.760[QC:b,c,e]			
S96T001094		B	0.430	0.382	0.406[QC:b,e]			
S96T001096	134:5A	A	0.183	0.183	0.183[QC:b]			
S96T001097	134:6A	Whole	0.0176	0.0127	0.0152[QC:b,e]			
S96T002134	135:1	Upper ½	0.103	0.0984	0.101[QC:e]			
S96T002135	135:1R	Whole	< 0.00288	< 0.00276	< 0.00282			
S96T001868	135:2	Upper ½	0.329	0.348	0.339			
S96T002136	135:2A	Whole	0.0109	0.0194	0.0152[QC:b,e]			
S96T001879	135:2R	Upper ½	0.0147	0.0151	0.0149[QC:b,c]			
S96T001880		Lower ½	0.0102	0.0122	0.0112[QC:b,e]			
Liquids			µCi/mL	µCi/mL	µCi/mL	µCi/mL	%	Ci
S96T000665	129:1	DL	< 0.0172	< 0.0172	< 0.0172	< 0.0108	N/A	< 1.26
S96T000682	129:2	DL	< 0.0109	< 0.0109	< 0.0109			
S96T001119	134:5B	DL	0.00536	< 0.00494	0.00515[QC:b]			
S96T001121	134:6A	DL	< 0.00225	< 0.00229	< 0.00227[QC:b]			

Table A-52. Tank 241-U-107 Analytical Results: Total Alpha. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids			μCi/mL	μCi/mL	μCi/mL	μCi/mL	%	Ci
S96T002140	135:1	DL	< 0.0133	< 0.0133	< 0.0133	Cont.	Cont.	Cont.
S96T002141	135:1R	DL	< 0.0165	< 0.0165	< 0.0165			
S96T002142	135:2A	DL	< 0.0117	< 0.0117	< 0.0117			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-53. Tank 241-U-107 Analytical Results: TIC. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			μg C/g	μg C/g	μg C/g	μg C/g	%	kg C
S96T000644	129:2	Upper ½	3,450	3,390	3,420	2,750	28.7	5,940
S96T000647		Lower ½	2,060	2,310	2,180			
S96T000650	129:3	Upper ½	1,740	1,640	1,690			
S96T000653		Lower ½	1,560	1,770	1,660			
S96T001143	129:3R	Upper ½	1,570	1,650	1,610			
S96T001055	134:2	Upper ½	2,050	2,230	2,140			
S96T001056		Upper ½	5,920	4,310	5,120[QC:e]			
S96T001064	134:4	A	7,050	7,020	7,040			
S96T001065		B	6,420	4,980	5,700[QC:e]			
S96T001057		Lower ½	8,820	9,020	8,920			

Table A-53. Tank 241-U-107 Analytical Results: TIC. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg C/g	µg C/g	µg C/g	µg C/g	%	kg C
S96T001068	134:5	A	2,170	1,950	2,060	Cont.	Cont.	Cont.
S96T001058		B	3,850	3,960	3,900			
S96T001059	134:5A	A	1,600	1,510	1,560			
S96T001070	134:6A	Whole	862	836.0	849.0			
S96T001873	135:2R	Upper ½	640	603.0	621.5			
S96T001874		Lower ½	3,290	N/A	3,290			
Liquids			µg C/mL	µg C/mL	µg C/mL	µg C/mL	%	kg C
S96T000665	129:1	DL	4,670	4,770	4,720	5,400	12.1	632
S96T003487	129:2	DL	7,520	7,190	7,360			
S96T001119	134:5B	DL	2,170	2,290	2,230			
S96T001121	134:6A	DL	196	269.0	232.5[QC:e]			
S96T002140	135:1	DL	4,920	5,010	4,960			
S96T002141	135:1R	DL	4,940	5,010	4,980			
S96T002142	135:2A	DL	6,860	6,830	6,840			
S95T000792	U-107-1 (Grab)	DL	6,290	6,320	6,300			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-54. Tank 241-U-107 Analytical Results: TOC. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Solids			µg C/g	µg C/g	µg C/g	µg C/g	%	kg C
S96T000644	129:2	Upper ½	4,870	5,010	4,940	2,070	30.5	4,470
S96T000647		Lower ½	1,860	1,970	1,920			
S96T000650	129:3	Upper ½	1,270	1,170	1,220			
S96T000653		Lower ½	1,370	1,390	1,380			
S96T001143	129:3R	Upper ½	921	843.0	882.0			
S96T001055	134:2	Upper ½	639	895.0	767.0[QC:e]			
S96T001056	134:3	Upper ½	1,890	1,920	1,900			
S96T001064	134:4	A	3,670	3,680	3,680			
S96T001065		B	3,050	4,220	3,640[QC:e]			
S96T001057		Lower ½	5,210	5,120	5,160			
S96T001068	134:5	A	9,520	8,560	9,040			
S96T001058		B	5,110	5,190	5,150			
S96T001059	134:5A	A	1,930	1,870	1,900			
S96T001070	134:6A	Whole	1,210	1,240	1,220			
S96T001873	135:2R	Upper ½	518	493.0	505.5			
S96T001874		Lower ½	919	N/A	919			
Liquids			µg C/mL	µg C/mL	µg C/mL	µg C/mL	%	kg C
S96T000665	129:1	DL	3,090	3,150	3,120	4,070	7.9	476
S96T003487	129:2	DL	4,880	4,820	4,850			
S96T001119	134:5B	DL	3,670	3,710	3,690			
S96T001121	134:6A	DL	993	1,100	1,050[QC:e]			

Table A-54. Tank 241-U-107 Analytical Results: TOC. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)	Projected Inventory
Liquids			µg C/mL	µg C/mL	µg C/mL	µg C/mL	%	kg C
S96T002140	135:1	DL	3,230	3,230	3,230	Cont.	Cont.	Cont.
S96T002141	135:1R	DL	3,190	3,200	3,200			
S96T002142	135:2A	DL	4,920	4,610	4,760			
S95T000792	U-107-1 (Grab)	DL	4,830	4,770	4,800			

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-55. Tank 241-U-107 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Sub-segment	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Solids			Temp. Range (°C)	% H_2O	Temp. Range (°C)	% H_2O	% H_2O	% H_2O	%
S96T000683[1]	129:1	Lower ½	35-215	18.52	35-225	19.37	18.95	22.7	16.3
S96T000644[1]	129:2	Upper ½	35-210	48.57	35-200	47.34	47.95		
S96T000647[1]		Lower ½	35-210	21.10	35-200	18.26	19.68[QC:e]		
S96T000650[1]	129:3	Upper ½	35-225	22.19	35-230	26.84	24.52[QC:e]		
S96T000653[1]		Lower ½	35-240	16.78	35-220	17.43	17.11		
S96T001143[2]	129:3R	Upper ½	27-167	4.957	22-166	6.364	6.40[QC:e]		
			Triplicate Result		24-164	7.871			
S96T001055[2]	134:2	Upper ½	21-141	6.940	22-166	7.604	7.27		
S96T001056[2]	134:3	Upper ½	23-196	13.119	23-168	12.262	12.69		
S96T001064[1]	134:4	A	35-195	23.61	35-175	22.76	23.19		
S96T001065[1]		B	35-205	28.65	35-190	27.64	28.14		
S96T001057[1]		Lower ½	35-215	34.53	35-185	39.23	36.88[QC:e]		
S96T001068[2]	134:5	A	35-240	38.28	35-215	43.35	40.81[QC:e]		
S96T001058[1]		B	35-240	44.21	35-180	28.19	36.51[QC:e]		
			Triplicate Result		35-205	37.14			
S96T001059[1]	134:5A	A	35-220	21.25	35-190	21.26	21.26		
S96T001070[1]	134:6A	Whole	35-100	91.44	35-105	91.02	91.23		
S96T002131[1]	135:1	Upper ½	35-200	32.41	35-230	37.23	34.82[QC:e]		
S96T002132[1]	135:1R	Whole	35-265	18.55	35-210	16.45	17.50[QC:e]		

Table A-55. Tank 241-U-107 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Sub-segment	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Solids			Temp. Range (°C)	% H_2O	Temp. Range (°C)	% H_2O	% H_2O	% H_2O	%
S96T001867[1]	135:2	Upper ½	35-160	49.90	35-170	49.74	49.82	Cont.	Cont.
S96T002133[1]	135:2A	Whole	35-240	16.38	35-240	15.46	15.92		
S96T001873[1]	135:2R	Upper ½	35-125	4.67	35-125	4.15	4.41[QC:e]		
S96T001874[2]		Lower ½	21-105	0.732	22-134	0.925	0.825[QC:e]		
Liquids			Temp. Range (°C)	% H_2O	Temp. Range (°C)	% H_2O	% H_2O	% H_2O	%
S96T000665[1]	129:1	DL	35-185	51.94	35-190	54.51	53.22	49.6	1.6
S96T000682[1]	129:2	DL	35-180	49.79	35-180	49.55	49.67		
S96T001119[2]	134:5B	DL	35-240	51.01	35-250	51.14	51.08 (45.55)[3]		
S96T001121[2]	134:6A	DL	35-160	91.695	35-170	92.219	91.96		
S96T002140[1]	135:1	DL	35-240	52.73	35-240	52.28	52.50		
S96T002141[1]	135:1R	DL	35-220	47.03	35-240	47.02	47.03		
S96T002142[1]	135:2A	DL	35-245	52.45	35-245	52.18	52.31(48.06)[3]		

Table A-55. Tank 241-U-107 Analytical Results: Weight Percent Water. (3 sheets)

Sample Number	Core: Segment	Sub-segment	Result		Duplicate		Sample Mean	Overall Mean	RSD (Mean)
Liquids			Temp. Range (°C)	% H_2O	Temp. Range (°C)	% H_2O	% H_2O	% H_2O	%
S95T000792[2]	U-107-1 (Grab)	DL	NP	51.31	NP	51.47	51.39	Cont.	Cont.

Notes:

NP = Not provided

[1]Percent water by thermogravimetric analysis using a Mettler™ instrument.
[2]Percent water by thermogravimetric analysis using a Perkin-Elmer™ instrument.
[3]Numbers in parenthesis have been corrected due to wash water contamination.

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-56. Tank 241-U-107 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Sub-segment	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids				mg	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)
S96T000683[1]	129:1	Lower ½	1	34.681	136.3	735.7	289.3	103.8	414.5	-12.4
			2	25.901	107.9	445.2	295.4	143.8	404.8	-11.4
S96T000644[1]	129:2	Upper ½	1	21.138	125.3	1,243.8	250.7	-141.2	---	---
			2	25.271	117.3	1,023.5	248.7	-132.1	---	---
S96T000647[1]		Lower ½	1	31.042	136.2	422.5	303.2	106.3	378.4	-9.6[QC:e]
			2	46.918	131.3	377.4	309.2	81.4	386.3	-8.2[QC:e]
S96T000650[1]	129:3	Upper ½	1	42.000	123.3	1,074.5	442.5	-25.5[QC:e]	---	---
			2	52.300	129.3	910.4	458.1	-10.7[QC:e]	---	---
S96T000653[1]		Lower ½	1	73.010	133.3	852.2	447.3	-13.9[QC:e]	---	---
			2	64.750	135.3	741.9	449.5	-30.0[QC:e]	---	---
S96T001143[2]	129:3R	Upper ½	1	18.130	101.99	141.82	304.95	134.18	---	---
			2	19.070	105.17	150.78	305.34	113.39	---	---
			3	27.430	108.06	161.9	302.4	133.19	---	---
S96T001055[2]	134:2	Upper ½	1	26.740	109.26	211.06	301.96	178.68	---	---
			2	16.110	96.28	155.19	301.51	120.25	---	---

Table A-56. Tank 241-U-107 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Sub-segment	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids (Cont.)				mg	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)
S96T001056[2]	134:3	Upper ½	1	16.800	109.02	296.4	290.76	91.05	---	---
			2	22.080	106.73	239.48	291.5	94.83	---	---
S96T001064[1]	134:4	A	1	55.171	139.3	768.0	399.9	3.8	---	---
			2	20.185	139.3	1,065.9	---	---	---	---
S96T001065[1]		B	1	24.021	111.3	894.4	262.3	41.3	---	---
			2	15.631	119.7	935.1	264.7	43.4	---	---
S96T001057[1]		Lower ½	1	13.150	114.5	994.1	232.0	-147.0	---	---
			2	24.890	133.4	1,372.1	243.8	-148.0	---	---
S96T001068[2]	134:5	A	1	37.540	135.989	1,218.624	---	---	---	---
			2	17.320	133.091	1,046.504	---	---	---	---
S96T001058[1]		B	1	54.750	97.3	972.3	270.5	25.7	381.4	-11.5[QC:e]
			2	11.490	125.1	863.6	284.3	-79.7[QC:e]	---	---
			3	11.710	106.8	1,641.1	370.1	-24.9[QC:e]	---	---
S96T001059[1]	134:5A	A	1	18.240	95.6	794.0	286.0	88.1[QC:b]	---	---[QC:b]
			2	36.010	94.8	1,013.4[QC:b]	---	---	---	---[QC:b]
S96T001070[1]	134:6A	Whole	1	10.300	103.3	1,801.0[QC:b]	---	---	---	---[QC:b]
			2	11.200	101.3	1,903.7[QC:b]	---	---	---	---

Table A-56. Tank 241-U-107 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Sub-segment	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Solids (Cont.)				mg	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)
S96T002131[2]	135:1	Upper ½	1	42.390	138.184	592.918	---	---	---	---
			2	29.090	127.787	851.417	---	---	---	---
S96T002132[1]	135:1R	Whole	1	39.023	138.3	345.5	299.3	144.4	---	---
			2	25.183	135.4	313.2	298.8	153.8	---	---
S96T001867[1]	135:2	Upper ½	1	9.376	127.0	1,273.8	394.6	-140.6[QC:e]	---	---
			2	8.130	125.0	1,543.4	390.6	-105.2[QC:e]	---	---
S96T002133[1]	135:2A	Whole	1	32.850	138.4	341.7	281.1	101.6	---	---
			2	21.010	137.5	337.0	287.5	125.3	---	---
S96T001873[1]	135:2R	Upper ½	1	10.091	305.1	184.0	---	---	---	---
			2	11.469	302.9	168.5	---	---	---	---
S96T001874[2]		Lower ½	1	28.110	109.96	115.71	152.6	3.35	306.39	170.59
			2	30.990	108.8	96.54	145.88	0.568	302.13	181.96

Table A-56. Tank 241-U-107 Analytical Results: Differential Scanning Calorimetry. (4 sheets)

Sample Number	Core: Segment	Sub-segment	Run	Sample Weight	Transition 1		Transition 2		Transition 3	
Liquids				mg	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)	Peak Temp. (°C)	ΔH (J/g)
S96T000665[1]	129:1	DL	1	17.140	117.6	1,008.2	226.4	-29.2	310.2	-25.6
			2	17.488	125.4	1,085.7	232.4	-23.2	310.3	-30.5
S96T000682[1]	129:2	DL	1	12.749	112.5	958.2	222.4	-40.1	308.3	-25.2
			2	13.452	124.3	1,065.6	236.4	-36.5	314.3	-27.2
S96T001119[2]	134:5B	DL	1	15.240	124.471	1,094.943	---	---	---	---
			2	13.480	119.075	1,043.756	---	---	---	---
S96T001121[2]	134:6A	DL	1	10.430	113.8	2,097.76	301.52	11.74	---	---
			2	10.040	107.922	1,887.265	---	---	---	---
S96T002140[1]	135:1	DL	1	17.232	129.4	839.1	238.6	-256.4	---	---
			2	18.781	127.3	853.2	236.6	-274.3	---	---
S96T002141[1]	135:1R	DL	1	25.381	117.3	785.2	224.6	-296.2	---	---
			2	18.053	127.7	863.9	236.7	-273.3	---	---
S96T002142[2]	135:2A	DL	1	15.800	123.5	1,267.5	255.93	19.67	---	---
			2	29.510	128.07	1,284.14	259.65	18.03	---	---
S95T000792	U-107-1 (Grab)	DL	1	NP	NP	1,056.8	NP	-74.4	---	---
			2	NP	NP	1,032.3	NP	-77.0	---	---

Notes:

NP = Not provided

[1]Percent water by thermogravimetric analysis using a Mettler™ instrument.
[2]Percent water by thermogravimetric analysis using a Perkin-Elmer™ instrument.

Table A-57. Tank 241-U-107 Analytical Results: pH.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)
Liquids							
S96T000665	129:1	DL	13.92	13.89	13.91	13.4	2.0
S96T000682	129:2	DL	13.90	13.90	13.90		
S96T001119	134:5B	DL	12.82	12.87	12.84		
S96T001121	134:6A	DL	12.84	12.78	12.81		
S96T002140	135:1	DL	12.82	12.85	12.84		
S96T002141	135:1R	DL	12.70	12.69	12.70		
S96T002142	135:2A	DL	13.50	13.48	13.49		
S95T000792	U-107-1 (Grab)	DL	13.72	13.73	13.73		

Note:

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

Table A-58. Tank 241-U-107 Analytical Results: Density. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)
Solids			g/mL	g/mL	g/mL	g/mL	%
S96T000642	129:2	Upper ½	1.520	N/A	1.520	1.52	4.1
S96T000645		Lower ½	I.S.	N/A	N/A		
S96T000648	129:3	Upper ½	1.480	N/A	1.480		
S96T000651		Lower ½	1.460	N/A	1.460		
S96T001140	129:3R	Upper ½	1.360	N/A	1.360		
S96T001043	134:2	Upper ½	1.410	N/A	1.410		
S96T001044	134:3	Upper ½	1.540	N/A	1.540		
S96T001061	134:4	A	1.740	N/A	1.740		
S96T001062		B	1.730	N/A	1.730		
S96T001047		Lower ½	1.660	N/A	1.660		
S96T001067	134:5	A	1.680	N/A	1.680		
S96T001066		B	1.760	N/A	1.760		
S96T001045	134:5A	A	I.S.	N/A	N/A		
S96T001046	134:6A	Whole	1.100	N/A	1.100		
S96T002130	135:2A	Whole	1.880	N/A	1.880		
S96T001869	135:2R	Upper ½	1.300	N/A	1.300		
S96T001870		Lower ½	1.310	N/A	1.310		
Liquids			g/mL	g/mL	g/mL	g/mL	%
S96T000637	129:1	DL	1.381	N/A	1.381	1.43	1.5
S96T000685	129:2	DL	1.400	N/A	1.400		
S96T000641	129:2	DL	1.435	N/A	1.435		

Table A-58. Tank 241-U-107 Analytical Results: Density. (2 sheets)

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean	Overall Mean	RSD (Mean)
Liquids			g/mL	g/mL	g/mL	g/mL	%
S96T001107	134:5B	DL	1.437	1.419	1.428	Cont.	Cont.
S96T001121	134:6A	DL	1.026	1.009	1.018		
S96T002140	135:1	DL	1.470	1.392	1.431		
S96T002141	135:1R	DL	1.474	1.412	1.443		
S96T002142	135:2A	DL	1.665	1.373	1.519[QC:e]		
S95T000792	U-107-1 (Grab)	DL	1.400	1.39	1.395		

Notes:

I.S. = insufficient sample

Sample results from core 134:6A were not included in the mean calculations due to contamination by the wash water used during sampling.

APPENDIX B

RESULTS OF WASH WATER CONTAMINATION CHECK FOR SINGLE-SHELL TANK 241-U-107

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B.0 RESULTS OF WASH WATER CONTAMINATION CHECK FOR SINGLE-SHELL TANK 241-U-107

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 contamination of the waste samples by the wash water.

In the tables, column 1 lists the laboratory sample identification number. For sampling rationale, locations, and a description of the sampling event, see Section 3.0.

Column 2 identifies the core and segment from which the sample was derived.

Column 3 identifies 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, and B refers to second quarter).

Columns 4 and 5, Result and Duplicate, are self-explanatory. Column 6 lists the average of the result and duplicate values. If the result and duplicate values were both detected, or one of two values is detected and the other nondetected, then the mean is expressed as a detected value. If the result and duplicate values were nondetected, then the mean is expressed as a nondetected value. The result and duplicate values and the result and 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 because the analytical results 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-U-107 samples were standard recoveries, spike recoveries, duplicate analyses (RPDs), and blanks (see Section 5.1.2). Specific information is provided in the appendix tables below. Sample and duplicate pairs in which any quality control parameters were outside their specified limits are superscripted in column 6 as follows:

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

Table B-1. Tank 241-U-107 Hydrostatic Head Fluid Contamination Check: Lithium.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean
Solids			µg/g	µg/g	µg/g
S96T000788	129:2	Upper ½	< 4.650	< 4.34	< 4.50
S96T000789		Lower ½	< 4.540	< 4.74	< 4.64
S96T000790	129:3	Upper ½	< 4.940	< 4.30	< 4.62
S96T000791		Lower ½	< 5.110	< 5.04	< 5.08
S96T001152	129:3R	Upper ½	< 5.590	< 5.08	< 5.34
S96T001080	134:2	Upper ½	< 5.940	< 5.06	< 5.50[QC:c]
S96T002284		Upper ½	< 9.710	< 9.27	< 9.49
S96T001081	134:3	Upper ½	< 5.650	< 5.85	< 5.75
S96T002285		Upper ½	< 9.890	< 9.89	< 9.89
S96T001083	134:4	A	< 6.000	< 5.74	< 5.87
S96T002287		A	< 10.10	< 8.97	< 9.54
S96T001084		B	< 5.300	< 5.34	< 5.32
S96T002288		B	< 8.380	< 8.73	< 8.56
S96T001082		Lower ½	< 5.320	< 5.48	< 5.40
S96T002286		Lower ½	< 9.180	< 8.93	< 9.06
S96T001086	134:5	A	17.20	35.50	26.35[QC:e]
S96T001085		B	53.60	51.60	52.60
S96T001087	134:5A	A	8.080	8.170	8.125
S96T001088	134:6A	Whole	1,830	1,900	1;860
S96T002161	135:2A	Whole	< 4.920	< 4.60	< 4.76[QC:a]
S96T001877	135:2R	Upper ½	< 4.740	< 4.92	< 4.83[QC:a]
S96T001878		Lower ½	< 4.620	< 4.42	< 4.52[QC:a]
Liquids			µg/mL	µg/mL	µg/mL
S96T000665	129:1	DL	< 10.00	< 10.0	< 10.0
S96T000682	129:2	DL	< 10.00	< 10.0	< 10.0
S96T001119	134:5B	DL	< 6.010	< 6.01	< 6.01
S96T001121	134:6A	DL	1,600	1,600	1,600[QC:e]
S96T002140	135:1	DL	< 6.010	< 6.01	< 6.01
S96T002141	135:1R	DL	< 6.010	< 6.01	< 6.01
S96T002142	135:2A	DL	< 6.010	< 6.01	< 6.01

Table B-2. Tank 241-U-107 Hydrostatic Head Fluid Contamination Check: Bromide.

Sample Number	Core: Segment	Sub-segment	Result	Duplicate	Sample Mean
Solids			µg/g	µg/g	µg/g
S96T000690	129:2	Upper ½	< 1,010	< 1,080	< 1,050
S96T000691		Lower ½	< 1,790	< 1,810	< 1,800
S96T000692	129:3	Upper ½	< 1,560	< 1,590	< 1,580
S96T000693		Lower ½	< 1,620	< 1,570	< 1,600
S96T001144	129:3R	Upper ½	< 2,280	< 2,240	< 2,260
S96T001071	134:2	Upper ½	< 941	< 940	< 941
S96T001072	134:3	Upper ½	< 1,050	< 1,080	< 1,070
S96T001074	134:4	A	< 1,190	< 1,240	< 1,220
S96T001075		B	< 1,400	< 1,310	< 1,360
S96T001073		Lower ½	< 1,310	< 1,410	< 1,360
S96T001077	134:5	A	1,840	< 968	1,400
S96T001076		B	2,560	2,630	2,600
S96T001078	134:5A	A	< 1,460	< 1,510	< 1,490
S96T001079	134:6A	Whole	23,000	23,200	23,100
S96T002160	135:2A	Whole	< 946	< 971	< 959
S96T001875	135:2R	Upper ½	< 948	< 977	< 963
S96T001876		Lower ½	< 883	< 897	< 890
Liquids			µg/mL	µg/mL	µg/mL
S96T000665	129:1	DL	< 522	< 522	< 522
S96T000682	129:2	DL	< 522	< 522	< 522
S96T001119	134:5B	DL	4,060	4,080	4,070
S96T001121	134:6A	DL	19,200	19,200	19,200
S96T002140	135:1	DL	< 522	< 522	< 522
S96T002141	135:1R	DL	< 522	< 522	< 522
S96T002142	135:2A	DL	3,390	3,610	3,500[QC:e]

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APPENDIX C

HISTORICAL SAMPLING EVENT

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C.0 ANALYTICAL RESULTS FROM THE OCTOBER AND DECEMBER 1974 SAMPLING EVENTS

Table C-1 and Table C-2 list the results from the October and December 1974 historical sampling events. Because the tank contents have changed considerably since those events, the data are provided for information only.

Table C-1. Sample from Tank 241-U-107.[1,2] (2 sheets)

Waste Tank 241-U-107		
Sample T-8938		
Received: October 14, 1974		
Physical Data		
Visual	Clear, yellow, no solids	
Radiation	5 mrad/hr	
pH	11.4	
DTA	No exotherm	
Specific Gravity	1.016	
Percent Water	99.77	
Cooling Curve Data		
Temperature (°C)	Time (minutes)	Percent Solids
40	90	None
35	45	None
25	45	None
20	45	None
15	45	None
10	45	None
5	45	None
Chemical Analysis		
Component	Lab Value	Lab Unit
Al	3.26×10^{-3}	moles/L
CO_3	1.27×10^{-3}	moles/L
F	$<4.78 \times 10^{-4}$	moles/L
OH	9.51×10^{-2}	moles/L
NO_2	4.99×10^{-3}	moles/L
NO_3	2.65	moles/L

Table C-1. Sample from Tank 241-U-107.[1,2] (2 sheets)

Waste Tank 241-U-107		
Chemical Analysis		
Component	Lab Value	Lab Unit
Na	0.191	moles/L
PO_4	2.58×10^{-2}	moles/L
Pu	3.24×10^{-5}	g/gal
Radiological Analysis		
Component	Lab Value	Lab Unit
$^{144}CePr$	8.14×10^{2}	μCi/gal
^{134}Cs	26.76	μCi/gal
^{137}Cs	4.96×10^{3}	μCi/gal
$^{89+90}Sr$	1.58×10^{3}	μCi/gal

Note:

[1]Wheeler (1974)

[2]The reliability of these data are questionable due to lack of proper QC documentation.

Table C-2. Sample from Tank 241-U-107.[1,2] (2 sheets)

Waste Tank 241-U-107		
Received: December 9, 1974		
Physical Data		
Component	Lab Value	Lab Unit
Wet Density	1.14	g/cc
Dry Density	0.727	g/cc
Water Content	50.0	Weight Percent
Chemical Analysis		
Component	Lab Value	Lab Unit
Al	0.30	M
Ba	0.02	M
Fe	0.09	M

Table C-2. Sample from Tank 241-U-107.[1,2] (2 sheets)

Waste Tank 241-U-107		
Received: December 9, 1974		
Chemical Analysis		
Component	**Lab Value**	**Lab Unit**
NO_2	<0.01	M
NO_3	2.76	M
Mg	0.03	M
Mn	0.01	M
PO_4	2.44	M
Pu	8.04×10^{-3}	g/L
Radiological Analysis		
Component	**Lab Value**	**Lab Unit**
^{60}Co	4.91×10^{-2}	μCi/L
^{134}Cs	5.13×10^{-2}	μCi/L
^{137}Cs	2.47×10^{4}	μCi/L
$^{89+90}Sr$	7.06×10^{4}	μCi/L

Note:

[1]Horton (1975a and 1975b)

[2]The reliability of these data are questionable due to lack of proper QC documentation.

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