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14-TF-0100

SEP 17 2014

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Ms. Hedges:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION SUBMITTAL OF THE VADOSE ZONE CHARACTERIZATION REPORT FOR 241-TX FARM IN COMPLETION OF HANFORD FEDERAL FACILITIES AGREEMENT AND CONSENT ORDER TARGET M-045-22-T01

References:
1. RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan*, Rev. 1.
2. RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm*, Rev. 1.

This letter transmits RPP-RPT-57964, *Vadose Zone Characterization Report for 241-TX Tank Farm*, Rev. 0A, which describes soil characterization required by Hanford Federal Facilities Agreement and Consent Order (HFFACO) Target M-045-22-T01, "Submit to Ecology as a Secondary Document the Results of the Vadose Zone Characterization in the 241-TX Farm per the Schedule in M-045-20." The due date for this submittal is September 30, 2014.

The work described in this report was performed under RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan*, Rev. 1 (Reference 1) and RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm*, Rev. 1 (Reference 2). This work plan and sample analysis plan were previously approved by the Washington State Department of Ecology under HFFACO Milestones M-045-20 and M-045-21.

~~241-TX~~
M-045-22-T01 M-045-21
M-045-20 1219870, 1220588

If you have any questions, please contact Mr. Doug Hildebrand, at (509) 373-9626.

Kevin W. Smith
Manager

TF:RDH

Attachment

cc w/attach:
Administrative Record
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ATTACHMENT

14-TF-0100

RPP-RPT-57964
VADOSE ZONE CHARACTERIZATION REPORT FOR 241-TX TANK FARM
REV. 0A

DOCUMENT RELEASE FORM

(1) Document Number:	RPP-RPT-57964	(2) Revision Number: 0A	(3) Effective Date: 9/16/14 JRR per T. Mesford
(4) Document Type:	☐ Digital Image ☐ Hard copy ☒ PDF ☐ Video	(a) Number of pages (including the DRF) or number of digital images	274
(5) Release Type	☐ New ☐ Cancel	☒ Page Change	☐ Complete Revision
(6) Document Title:	Vadose Zone Characterization Report for 241-TX Tank Farm	(7) USQ No.: RPP-27195	R- ☒ N/A
		USQ Evaluator	Sign/Date
(8) Change/Release Description:	Revised two bullets on technetium-99 concentrations and corresponding Table 2-4 footnote; also changed highlighting color in Table 2-4. Corrected page numbering in section 2.0.		
(9) Change Justification:	Changes requested by DOE-ORP reviewer.		

(10) Associated Structure, System, and Component (SSC) and Building Number:	(a) Structure Location: N/A		(c) Building Number: N/A	(e) Project Number: T2C20
	(b) System Designator: N/A		(d) Equipment ID Number (EIN): N/A	

(11) Impacted Documents:	(a) Document Type	(b) Document Number	(c) Document Revision
	N/A	N/A	N/A

(12) Approvals:

(a) Author (Print/Sign): C. L. Tabor Concurred by telecon, TB Mesford 09/16/2014 Date: 09/16/2014

(b) Reviewer (Optional, Print/Sign): R. M. Allen Concurred by e-mail TB Mesford 09/15/2014 Date: 09/15/2014

Date: Date:

Date: Date:

Date: Date:

(c) Responsible Manager – (Print/Sign): S. J. Eberlein Date: 09/16/14

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Release Stamp: DATE: Sep 16, 2014 HANFORD RELEASE

(14) Clearance	(a) Cleared for Public Release	(b) Restricted Information?	(c) Restriction Type:
	☒ Yes ☐ No	☐ Yes ☒ No	

(15) Clearance Review (Print/Sign): APPROVED By Julia Raymer at 6:53 am, Sep 16, 2014 Date:

RPP-RPT-57964, Rev. 0A

Vadose Zone Characterization Report for 241-TX Tank Farm

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U.S. Department of Energy Contract DE-AC27-08RV14800

EDT/ECN: DRF UC:
Cost Center: Charge Code:
B&R Code: Total Pages: 274

Key Words: 241-TX Tank Farm, TX Farm, interim surface barrier, ISB, leak assessment, vadose zone

Abstract: The purpose of this report is to provide a summary of vadose zone characterization information collected for 241-TX Tank Farm and to identify if an interim surface barrier or other interim measure is warranted at 241-TX Tank Farm.

APPROVED
By Julia Raymer at 6:54 am, Sep 16, 2014
Release Approval Date

DATE: Sep 16, 2014 HANFORD RELEASE
Release Stamp

Approved For Public Release

Tank Operations Contractor (TOC) RECORD OF REVISION	(1) Document Number: RPP-RPT-57964	Page 1

(2) Title:
Vadose Zone Characterization Report for 241-TX Tank Farm

Change Control Record

(3) Revision	(4) Description of Change – Replace, Add, and Delete Pages	Authorized for Release	
		(5) Author. (print/sign/date)	(6) Resp. Mgr. (print/sign/date)
0A RS	Revised two bullets on technetium-99 concentrations and corresponding Table 2-4 footnote; also changed highlighting color in Table 2-4. Corrected page numbering in section 2.0.	C. L. Tabor Concurred by telecon 09/16/2014 TB Mesford	S. J. Eberlein 09/16/14

RPP-RPT-57964
Revision 0A

Vadose Zone Characterization Report for 241-TX Tank Farm

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Date Published
September 2014

Prepared for the U.S. Department of Energy
Office of River Protection

Contract No. DE-AC27-08RV14800

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Abbreviations and Acronyms

2D	two-dimensional
bgs	below ground surface
ft	foot/feet
Ecology	State of Washington Department of Ecology
FIR	Field Investigation Report
GJO	Grand Junction Office
GPR	ground penetrating radar
HEIS	Hanford Environmental Information System
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
ISB	interim surface barrier
MW	metal waste
PFP	Plutonium Finishing Plant
PUREX	Plutonium Uranium Extraction (plant)
RCRA	*Resource Conservation and Recovery Act of 1976*
REDOX	Reduction-Oxidation (S Plant)
SALDS	State-Approved Land Disposal Site
SGE	surface geophysical exploration
SRR	Strontium Recovery waste (strontium encapsulation)
SST	single-shell tank
WMA	Waste Management Area

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1.0 PURPOSE, SCOPE, DESCRIPTION, AND LEAK ASSESSMENT SUMMARY

1.1 PURPOSE AND SCOPE

The purpose of this report is to provide a summary of characterization information collected for 241-TX Tank Farm (TX Farm) and to identify if an interim surface barrier (ISB) or other interim measure is warranted at TX Farm. The requirements for this characterization effort are identified in RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan.* As identified in RPP-PLAN-53808, this characterization report is to be submitted September 30, 2014 to the State of Washington Department of Ecology (Ecology) to meet *Hanford Federal Facility Agreement and Consent Order* (HFFACO) (Ecology et al. 1989) Target M-045-22-T01.

This characterization report is considered a secondary document, and it describes the results of vadose zone characterization in TX Farm. Although the report provides an overview of the various information collected for TX Farm, it focuses on information collected per the following documents:

- RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan* (HFFACO Milestone M-045-20)
- RPP-ENV-53773, *Data Requirements for Characterization Supporting Interim Measures in TX Farm*
- RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* (HFFACO Milestone M-045-21).

This characterization report also provides summary level information regarding previous characterization efforts and general information about TX Farm, including leak assessment summary.

The report is organized into the following sections:

- Purpose, Scope, Description, and Leak Assessment Summary (Section 1.0)
- Characterization Efforts (Section 2.0)
- Conclusions and Recommendations (Section 3.0).

Support information is provided in the following appendices:

- Leak Assessment Support Information (Appendix A)
- Geologic Summary Information (Appendix B)
- Interim Measures Investigation Sample Depth and Location Meeting Notes (Appendix C)
- Interim Measures Investigation Direct Push Logging Results (Appendix D)
- Interim Measures Investigation Sample Chains of Custody (Appendix E)
- Interim Measures Investigation Deep Electrode Placement (Appendix F)
- Interim Measures Investigation Decommissioning Dates (Appendix G).

1.2 LEAK ASSESSMENT SUMMARY

TX Farm was constructed between 1947 and 1948; it is located in the northwest portion of the 200 West Area of the Hanford Site and is part of Waste Management Area (WMA) TX-TY. TX Farm consists of 18 second-generation single-shell tanks (SSTs), each with a capacity of 758,000 gallons (gal) and a 75-foot (ft) (22.9-m) diameter. In addition to the tanks, the TX Farm systems include diversion boxes, pipelines, and other ancillary equipment that supported the transfer of waste to and from the various Hanford Site waste tanks and farms. These tanks stored hazardous waste produced during the processing of irradiated fuel during weapons production.

The 18 tanks were constructed at different elevations with connecting overflow lines that allowed waste to cascade from tank to tank. The first two cascades (tanks 241-TX-101 [TX-101] through 241-TX-108 [TX-108]) were filled with T Plant metal waste. During the 1950s, six of the tanks were sluiced until empty and started receiving Reduction-Oxidation (REDOX) (S Plant) waste. Tanks 241-TX-103 (TX-103) and TX-108 were used for tributyl phosphate waste after sluicing. These tanks were used as evaporator bottoms waste feeder tanks and recycled for the 242-T Evaporator in later years. The third cascade (tanks 241-TX-109 [TX-109] through 241-TX-112 [TX-112]) stored first-cycle decontamination waste before use with the 242-T Evaporator. The last six tanks were not used until the early 1950s, and were used in combination with the 242-T Evaporator, as feed, bottoms and recycle waste tanks. TX Farm has been interim stabilized and isolated. All raw water is cut off at the farm edge; however, minimal air and electrical services remain within the tank farm.

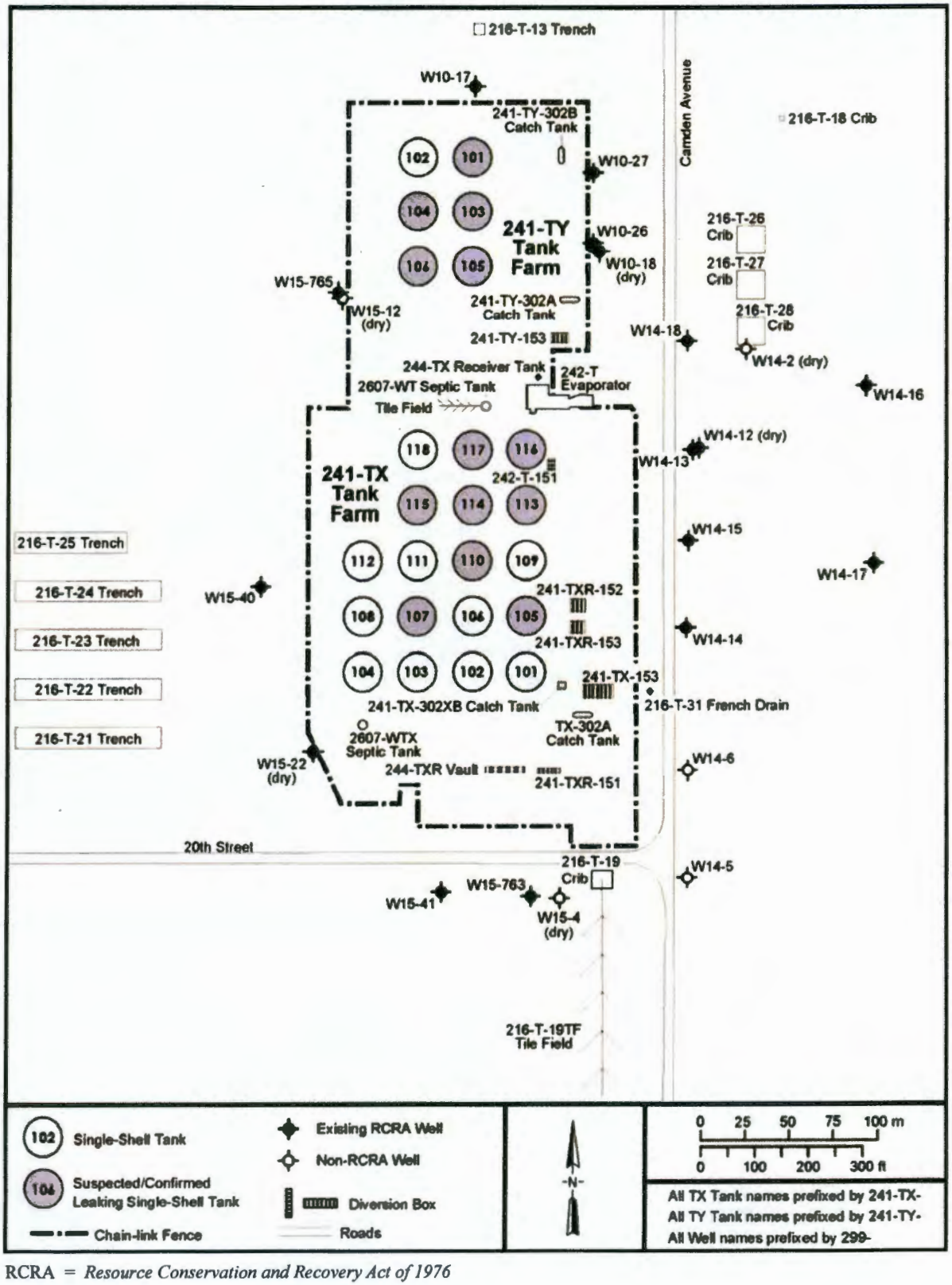
Figure 1-1 shows the layout of WMA TX-TY. Note that the WMA boundary identified in Figure 1-1 is associated with groundwater monitoring and is essentially the perimeter fence. Note that the WMA boundary for closure and corrective measures may include areas beyond the current perimeter fence(s) that have been affected by releases from SSTs or ancillary equipment (e.g., pipeline breaks outside the fence line).

Leak Assessment Information. As noted above, the purpose of this report is to evaluate new and existing information to help determine if an interim barrier or other interim measure is warranted at TX Farm. The following factors are important regarding tank farm characterization and barrier evaluations (e.g., choosing sampling locations) (RPP-ENV-38696, *Data Requirements for Characterization Supporting Near-Term Interim Barriers*).

- When and where the leak or tank overfill occurred or could have occurred. Extensive measurements of gamma radiation show that in the Hanford formation, soluble (mobile) contaminants move downward ~2 to 3 ft (0.6 to 0.9 m) per year after initial movement (i.e., after a leak event) and if it is determined that contaminant movement is greater, suggest that there might be potential impacts to the groundwater as a result of preferential pathways, impermeable formation, and other subsurface features if found or determined to be present.

- Sources of releases. Often there can be several sources of contamination. Knowledge of potential sources can aid in putting the pieces together.

Figure 1-1. Waste Management Area TX-TY and Surrounding Facilities.



RCRA = *Resource Conservation and Recovery Act of 1976*

- Type of waste stream involved in the leak. Over 50 waste types have been identified at Hanford. These waste types have different concentrations of key contaminants as well as different ratios between key contaminants. Such information can help determine how much of a contaminant may be present and how fast the contaminant may be moving (i.e., mobility).

- Numeric relationship of data at this location to data of the same type nearby. Comparing data at this location to a nearby location can provide trends (e.g., concentrations, geologic elevations) that can aid in developing an integrated and coherent understanding of the system.

- Nearby facilities and their event history (e.g., leaking waterlines, sinkholes, liquid discharge sites).

Table 1-1 provides summary information of tank waste leak events from RPP-RPT-50870, *Hanford 241-TX Farm Leak Inventory Assessment Report*. The leak assessment evaluation process has identified tank 241-TX-104 (TX-104) as a "potential leaker" (8,300 to 25,000 gal). Currently, the *Waste Tank Summary Report for Month Ending March 31, 2014* (HNF-EP-0182, Revision 315) identifies eight of the tanks in TX Farm as "assumed leakers." The "assumed leakers" are tanks 241-TX-105 (TX-105), 241-TX-107 (TX-107), 241-TX-110 (TX-110), 241-TX-113 (TX-113), 241-TX-114 (TX-114), 241-TX-115 (TX-115), 241-TX-116 (TX-116), and 241-TX-117 (TX-117). When the waste tank summary report is updated, information regarding tank TX-104 will be evaluated for inclusion. It is important to note that five tanks (TX-110, TX-113, TX-115, TX-116, and TX-117) were identified during the leak assessment process as being tanks that should be re-evaluated with respect to being "assumed leakers." Appendix A provides additional TX Farm leak assessment information.

Table 1-1. Summary of Tank Waste Loss Events. (3 sheets)

Tank	Description	HNF-EP-0182 Waste Loss Estimate (gal)	Revised Estimate[1]
241-TX-104	Currently classified as a "sound" tank. Drywells 51-04-02 and 51-04-05 show high uranium activity at 45 ft (13.7 m) below ground surface. The proximity of these drywells to spare inlets and evidence of tank overfills indicate metal waste may have been released from the spare inlets. However, a tank leak (i.e., failed liner) is possible. The estimated volume and inventory of the release was based on drywell logging and borehole results and the composition of metal waste.	0	8,300 to 25,000 gal 0.01 to 0.03 Ci of ^{238}U, 800 to 2,500 Ci ^{137}Cs (Recommend tank integrity assessment)
241-TX-105	Currently classified as an "assumed leaker." The ^{235}U and ^{238}U in drywells near tank 241-TX-105 appears to be the result of a transfer line or spare inlet release in the 1950s or may be a tank leak. The estimated volume and inventory of the release was based on drywell logging and borehole results and the composition of metal waste.	--[2]	50,000 to 125,000 gal 0.06 to 0.15 Ci of ^{238}U, 5,000 to 12,500 Ci ^{137}Cs (Recommend tank integrity assessment; may need additional characterization to determine source)
241-TX-107	Currently classified as an "assumed leaker." The ^{60}Co and ^{154}Eu activity near tank 241-TX-107 appears to be from a tank leak of SRR waste. The size of the leak and inventory of waste released was estimated based on drywell ^{60}Co activity and Hanford Defined Waste model estimates for SRR waste concentrations.	2,500 gal	1,300 gal 0.22 Ci of ^{60}Co, 1,030 Ci of ^{137}Cs
241-TX-110 (TX-110)	Currently classified as an "assumed leaker." Gamma activity measured in drywell 51-10-12 on the northwest side of tank TX-110 may be attributed to migration from tank 241-TX-114 (TX-114) or may indicate a release from tank TX-110. Neither drywells nor surface level measurements indicate a release from near this tank.	--[2]	Recommended tank integrity assessment.
241-TX-113	Currently classified as an "assumed leaker." The inventory associated with ^{137}Cs activity at 45 ft (13.7 m) in drywell 51-14-04 is included as part of the tank TX-114 inventory. No inventory for a release was estimated for this tank.	--[2]	Recommended tank integrity assessment.
241-TX-114	Currently classified as an "assumed leaker." The ^{137}Cs in drywell 51-14-04 appears to be from a tank leak of 242-T Evaporator campaign saltcake, evaporator bottoms waste. The size of the leak and inventory of waste released was based on drywell ^{137}Cs activity and 1974 tank TX-114 sample concentrations.	--[2]	~7,000 gal 6,000 Ci of ^{137}Cs

Table 1-1. Summary of Tank Waste Loss Events. (3 sheets)

Tank	Description	HNF-EP-0182 Waste Loss Estimate (gal)	Revised Estimate[1]
241-TX-115	Currently classified as an "assumed leaker." Drywell data shows low activity attributed to migration from another source. Neither drywells nor surface level measurements indicate a release from near this tank.	--[3]	Recommended tank integrity assessment.
241-TX-116	Currently classified as an "assumed leaker." Drywell data shows low activity attributed to migration from another source and there is no occurrence report or indication of a liquid level decrease for this tank. No inventory for a release was estimated for this tank.	--[3]	Recommended tank integrity assessment.
241-TX-117	Currently classified as an "assumed leaker." Drywell data shows low activity attributed to migration from another source and there is no occurrence report or indication of a liquid level decrease for this tank. No inventory for a release was estimated for this tank.	--[3]	Recommended tank integrity assessment.
241-TX-118	Currently classified as "sound." The tank appears to be sound (no liner leak), as currently classified. However, drywell 51-18-03 shows that waste was released on the east side of the tank near the cascade line. A range of release volumes was estimated based on ^{137}Cs and ^{60}Co drywell visualizations and assumption that the waste released was saltcake from the 242-T Evaporator campaign (1951-1955). If the waste was Reduction-Oxidation (S Plant) high-level waste saltcake, the leak volume would be lower.	NA	Likely cascade line or transfer line release. 1,320 gal 3,600 Ci ^{137}Cs
Other 241-TX Farm (TX Farm) single-shell tanks (SSTs)	Some SSTs show activity in nearby drywells that has previously been attributed to operational spills, overflows or line leaks, but no evidence of a liner failure was found for any of these tanks and no basis provided for an inventory estimate for releases from these tanks. The volume and inventory of near-surface releases in TX Farm will be estimated based on drywell data and volume and inventory estimates for designated unplanned releases and other release events.	NA	NA

Table 1-1. Summary of Tank Waste Loss Events. (3 sheets)

Tank	Description	HNF-EP-0182 Waste Loss Estimate (gal)	Revised Estimate[1]
Surface Spills and Releases near tanks in TX Farm	Surface spills and releases are evident across most of TX Farm. The volume and inventory of near-surface releases in TX Farm were estimated based on drywell data in the top 10 ft (3 m) below ground surface over ~220,000 ft^2 (20,439 m^2) (approximate area covering the tanks). Volume released depends on waste type and composition. If all of the near-surface releases were saltcake from the 242-T Evaporator campaign (1955-1965), the volume would be only ~400 gal; if all bismuth phosphate first cycle decontamination waste, the volume would be ~90,000 gal.	NA	~100 Ci ^{137}Cs based on drywell data. Between 400 and 90,000 gal depending on composition of waste released.
Other Unplanned Releases	Known releases are described in Appendix A, Table A-1.	NA	Unknown, no estimates for unplanned releases in TX Farm in RPP-26744, *Hanford Soil Inventory Model, Rev. 1.*
Intentional Releases to Cribs and Trenches near TX Farm	Waste was discharged from tanks to nearby cribs and trenches.	NA	~140 million gal ~3,700 Ci ^{137}Cs

[1] Except as noted, ^{137}Cs inventories are decayed to January 1, 2001 consistent with values in the Hanford Soil Inventory Model.

[2] The leak volume estimates are based on information from HNF-EP-0182.

[3] The leak volume estimates in HNF-EP-0182 for these tanks were based on an assumption made in 1989 (8901832B R1, "Single-Shell Tank Leak Volumes" – Letter) that the estimated waste release volume was the average of waste level decreases of similar tanks. The total estimated liquid-loss was identified in the reference letter to be 150,000 gal, averaged to be ~8,000 gal per tank. A further investigation (RPP-RPT-50870, *Hanford 241-TX Farm Leak Inventory Assessment Report*) showed that this estimating technique was too generalized and that neither the drywell readings nor surface level measurements indicated a liquid level decrease for these tanks. Recommended in RPP-RPT-50870 was for the current leak classification to be reassessed per TFC-ENG-CHEM-D-42, "Tank Leak Assessment Process;" there likely was not a loss of integrity by these tanks (no waste released due to a tank leak) and the tanks should be designated as "sound."

SRR = Strontium Recovery waste (strontium encapsulation), from sluiced tank farms plutonium uranium extraction sludge, mainly 241-A and 241-AX Tank Farms.

Reference:
HNF-EP-0182, *Waste Tank Summary Report for Month Ending March 31, 2014*, Rev. 315.

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2.0 CHARACTERIZATION EFFORTS

This section contains information regarding previous site characterization efforts and those efforts supporting the interim measures investigation. Characterization efforts include:

- *Resource Conservation and Recovery Act of 1976* (RCRA) Phase 1 soil sampling and logging information (Section 2.1)
- Drywell logging (Section 2.2)
- Surface geophysical exploration (Section 2.3)
- Interim measures investigation information (Section 2.4).

The geologic information associated with TX Farm has been developed and refined by information gained through the above activities, and it has been described in various Hanford reports including RPP-PLAN-53808. With respect to TX Farm, there are four major stratigraphic units underlying the farm. They include the following (in ascending order):

- Igneous Columbia River Basalt Group
- Miocene- to Pliocene-age Ringold Formation (including members of Taylor Flats and members of Wooded Island)
- Cold Creek unit
- Hanford formation (including subunits H1 and H2).

Additional information on the geology relating to TX Farm is provided in Appendix B and in the following subsections.

2.1 *RESOURCE CONSERVATION AND RECOVERY ACT OF 1976* PHASE 1 SOIL SAMPLING AND LOGGING INFORMATION

Field work was conducted in WMA TX-TY as part of the RCRA Phase 1 characterization effort and the installation of an ISB over 241-TY Tank Farm (TY Farm). Four boreholes were drilled and sampled during 2002 within or near the TX Farm. Information was provided in PNNL-14594, *Characterization of Vadose Zone Sediments Below the TX Tank Farm: Boreholes C3830, C3831, C3832, and RCRA Borehole 299-W10-27* and RPP-23752, *Field Investigation Report for Waste Management Areas T and TX-TY*. Boreholes C3830, C3831, and C3832 were drilled via the closed-end probe method within TX Farm for the specific purpose of

collecting core samples for physical and chemical characterization. Figure 2-1 identifies the location of these boreholes. The following text also identifies the location of the boreholes and provides some sampling information (e.g., total borehole depth).

- Borehole C3830 is located ~40 ft (12.2 m) southwest of SST TX-105. Borehole C3830 was drilled and sampled between August 20 and September 5, 2002, to a total depth of 116.8 ft (35.6 m) below ground surface (bgs). Refusal was encountered near the top of the caliche within the lower Cold Creek unit.

- Borehole C3831 is located ~40 ft (12.2 m) southwest of SST TX-107. Borehole C3831 was drilled and sampled between July 1 and August 7, 2002. Refusal was encountered at 115.4 ft (35.3 m) bgs in the caliche within the lower Cold Creek unit.

- Borehole C3832 is located ~20 ft (6.1 m) south-southeast of SST TX-104. Borehole C3832 was drilled and sampled between May 2 and June 3, 2002. Refusal was encountered at 115.9 ft (35.3 m) bgs in the caliche within the lower Cold Creek unit.

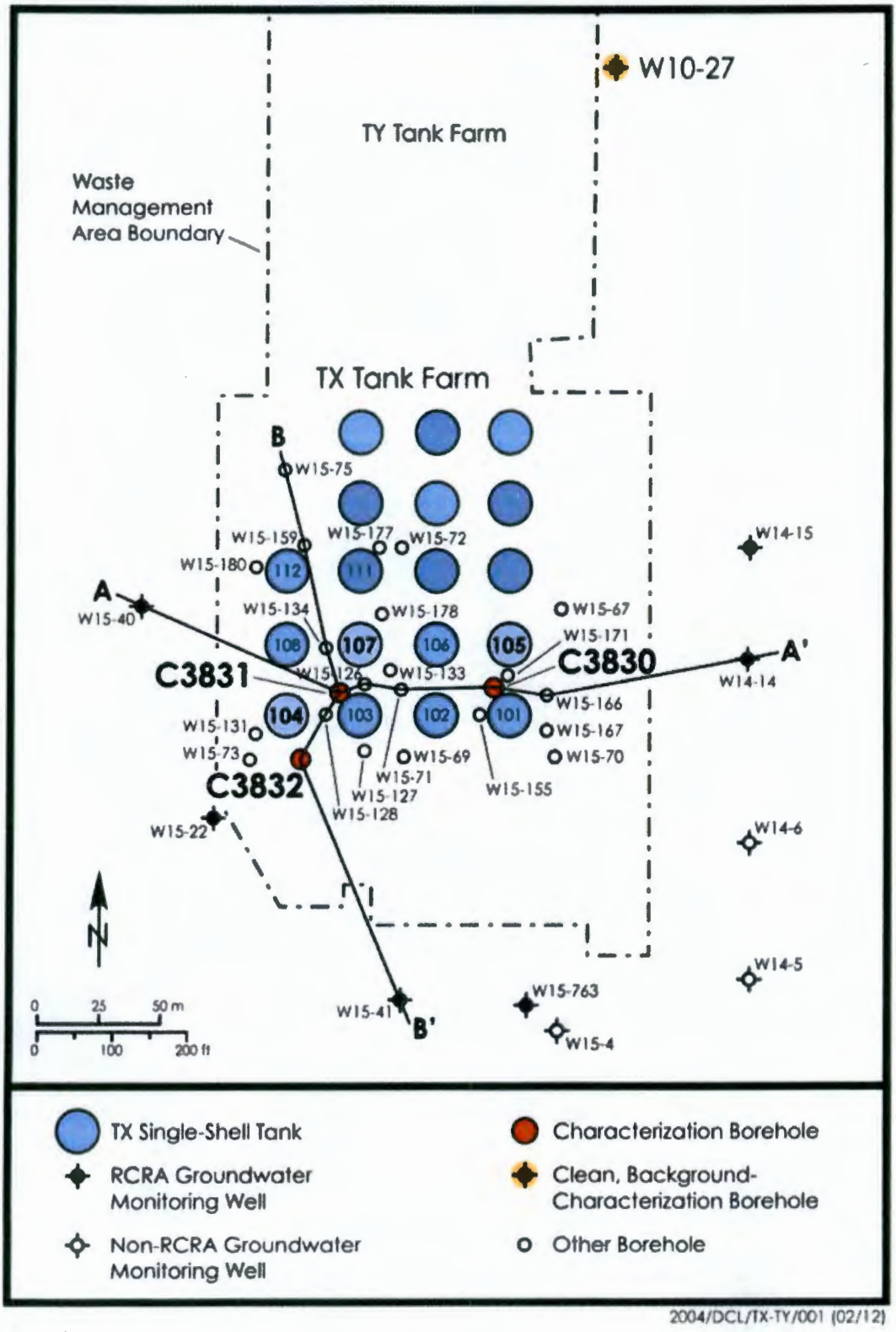
In addition, core samples were collected in well 299-W10-27 (C3125) from 50 to 132 ft (15.2 to 40.2 m) bgs. Well 299-W10-27 is a RCRA groundwater monitoring well ~656 ft (200 m) northeast of TX Farm. The Field Investigation Report (FIR) identified that the soil from well 299-W10-27, particularly the H2 unit of the Hanford formation, was contaminated by waste fluids enriched in nitrate, sodium, and sulfate.

All borehole samples underwent screening analyses consisting of nitrate analysis by the colorimetric method, pH measurement, electrical conductance measurement, and gamma-energy analysis. The FIR identified the following information with respect to the analysis of the three boreholes.

- A thick zone of ^{99}Tc occurs in the soil samples from borehole C3831 that extends from 53 ft (16.2 m) to the bottom of the borehole at 115 ft (35 m) in the Cold Creek unit (maximum concentration of 137 pCi/g). Elevated concentrations of several constituents in borehole C3831 soil are present that are attributed to fluids from tank TX-107. The primary set of tank waste constituents includes ^{99}Tc, ^{60}Co, nitrate, and sodium. The maximum concentrations for these constituents at this location are:
  - ^{99}Tc, 137 pCi/g (60 to 61 ft bgs)
  - ^{60}Co, 51 pCi/g (~60 to 75 ft bgs)
  - Nitrate, 866 µg/g (86 ft bgs)
  - Sodium, 430 µg/g (60 to 61 ft bgs).

- In borehole C3832, the following are elevated water-extractable concentrations most likely attributed to a tank waste source near tank TX-104:
  - Nitrate, 98 µg/g (~105 to 115 ft bgs)
  - ^{99}Tc, 12 pCi/g (~105 to 115 ft bgs)
  - Uranium, 2.7 µg/g (~75 to 110 ft bgs)
  - Sodium, 67 µg/g (76 ft bgs).

Figure 2-1. Location of *Resource Conservation and Recovery Act of 1976* Phase 1 Soil Sampling and Logging Information Locations.



- In borehole C3830, the following are elevated water-extractable concentrations attributed to a tank waste source:
  - ^{99}Tc, 11 pCi/g (~78 to 87 ft bgs)
  - Nitrate, 84 µg/g (~78 to 87 ft bgs)
  - Uranium, 2.79 µg/g (67 ft bgs).

Soil from the three TX Farm boreholes shows that sodium-, nitrate-, and sulfate-dominated contaminants are present below tanks TX-104, TX-105, and TX-107. Most of the chemical data for contaminants intercepted by boreholes C3831 and C3832 suggest that fluid leaked from tank TX-107 and may have percolated deeper into the soil and traveled southwest to borehole C3832.

PNNL-14594 also recommends conservative K_d values (distribution coefficient or sorption partition coefficient) for potential contaminants in the H2 unit:

- 0 milliliters/gram (mL/g) for nitrate and ^{99}Tc
- 1 mL/g for uranium
- 10 mL/g for chromium.

More recently, K_d values have been evaluated for use in WMA C performance assessment efforts (refer to Revision 1 of RPP-RPT-46088, *Flow and Transport in the Natural System at Waste Management Area C*). The following are K_d values presented for this effort:

- 0 mL/g for nitrate, ^{99}Tc, and chromium
- 0.6 to 2 mL/g for uranium.

Note that the lower the K_d value, the lower the retardation factor, and the faster a species migrates through the subsurface.

2.2 DRYWELL LOGGING

There are a total of 96 drywells in TX Farm; 9 of these drywells were installed in 1949 with the rest in 1970 or later. All wells were spectral gamma logged in the late 1990s (GJO-97-13-TAR/GJO-HAN-11, *Hanford Tank Farms Vadose Zone: TX Tank Farm Report* and GJO-97-13-TARA/GJO-HAN-11, *Hanford Tank Farms Vadose Zone: Addendum to the TX Tank Farm Report*). Of the 96 drywells in TX Farm, 43 of them had ^{137}Cs contamination greater than or equal to 10 pCi/g (Figure 2-2). Most of the ^{137}Cs contamination was found from 0 to 45 ft (13.7 m) bgs, with only six drywells (Figure 2-3) having contamination above 100 pCi/g between ground surface and 45 ft (13.7 m) bgs. Only drywell 51-14-04 had ^{137}Cs concentrations above 10 pCi/g at greater than 45 ft (13.7 m) bgs; no ^{137}Cs values were above 10 pCi/g at depths lower than 50 ft (15.2 m) bgs. The highest recorded ^{137}Cs was ~67,750 pCi/g at 46 ft (14.0 m) bgs at drywell 51-14-04.

Figure 2-2. Gamma Contamination >10 pCi/g and <100 pCi/g between 0 and 35 Feet below Ground Surface.

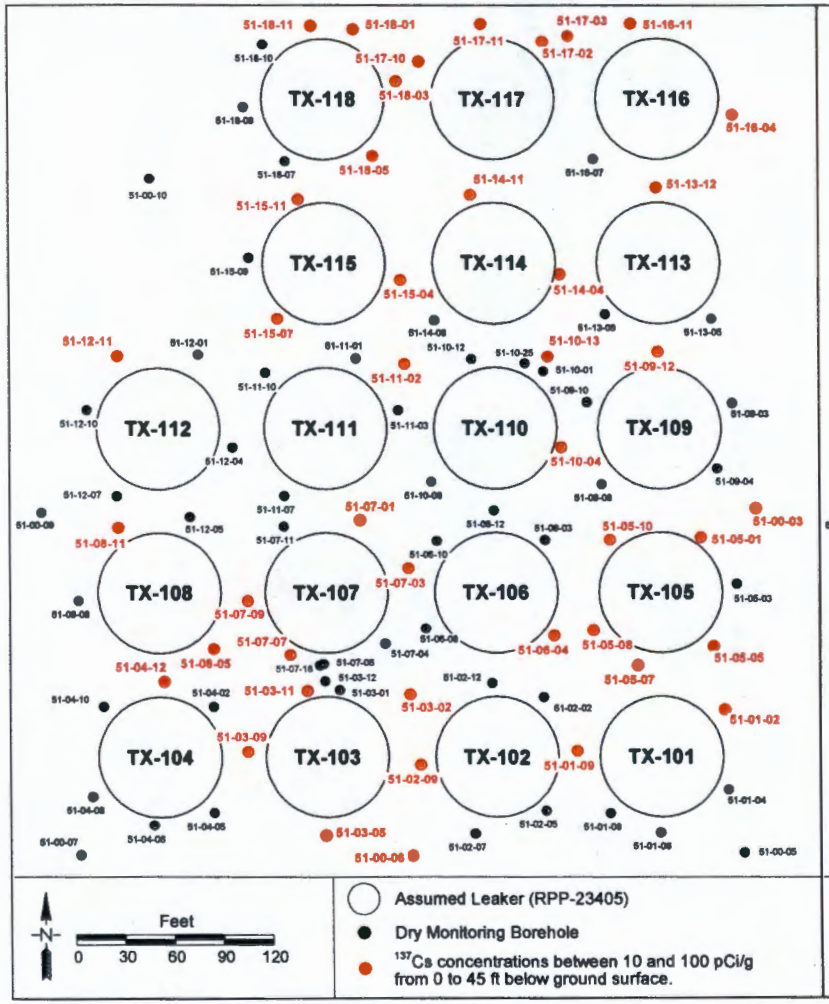
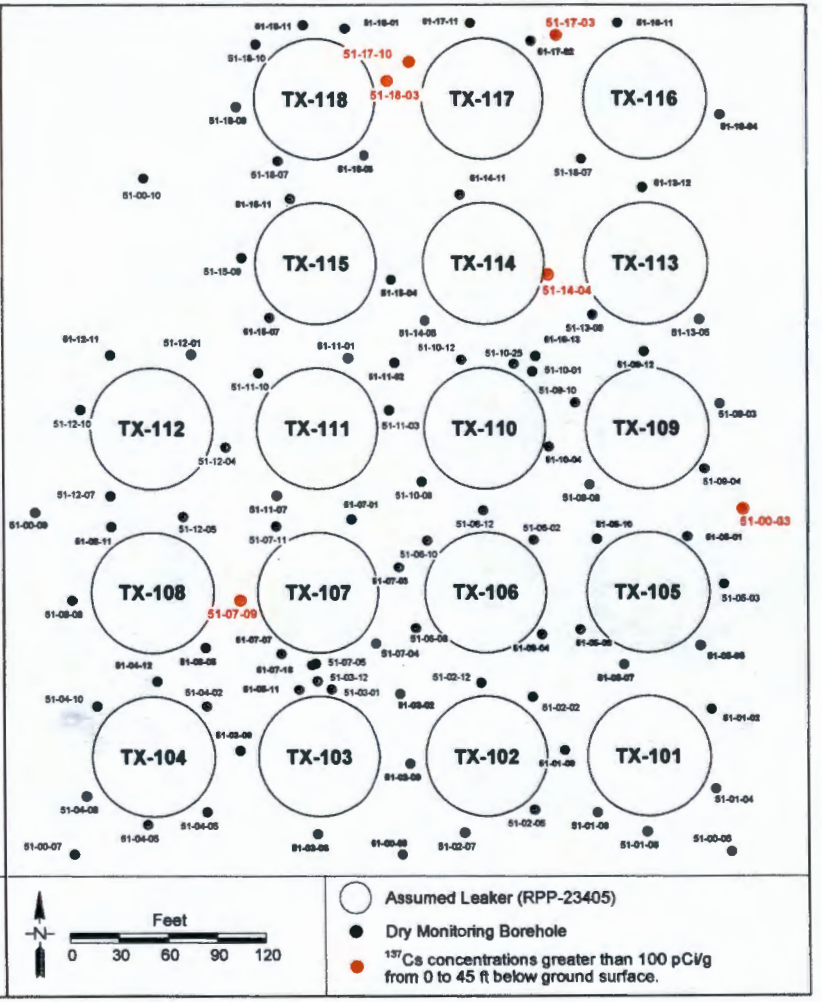


Figure 2-3. Gamma Contamination >100 pCi/g between 0 and 35 Feet below Ground Surface.



Reference: RPP-23405, *Tank Farm Vadose Zone Contamination Volume Estimates.*

Drywells 51-03-01, 51-03-11, 51-03-12, 51-07-18, 51-07-07, 51-03-09, and 51-04-05 show commonality in current spectral gamma characteristics and historical migration patterns, suggesting leakage from tank TX-107 beginning about 1975. The primary gamma emitter is ^{60}Co, which is present from 45 to 70 ft (13.7 to 21.3 m) bgs. Europium-154 also is present at 50 to 60 ft (15.2 to 18.3 m) bgs in all but the two southernmost drywells, 51-03-09 and 51-04-05. Historical gamma data indicate migration of ^{60}Co from northeast to the southwest over time between 1977 and 1992. Interpreted historical gamma data (RPP-6353, *Analysis and Summary Report of Historical Dry Well Gamma Logs for the 241-TX Tank Farm – 200 West*) suggest more than one migration event in drywells 51-03-11, 51-07-18, 51-07-07, and 51-04-05. Given the time of the leak and the tank waste history, waste lost from this tank was B-Plant waste, generated by ^{137}Cs recovery from Plutonium Uranium Extraction Plant supernatant liquid. Refer to Figure 2-4 for cobalt and europium "plumes."

The FIR delineated two uranium plumes and a co-mingled ^{60}Co and europium plume in the southern half of TX Farm from drywell measurements (Figure 2-4, blue areas). The first plume is between tanks TX-101 and TX-105 with ^{238}U values ranging from 1 to 100 pCi/g from 45 to 75 ft bgs. The ^{235}U concentrations mirror the ^{238}U values, but about an order of magnitude lower. The highest uranium levels occur at shallow depths toward the northeast. The second uranium plume with similar concentrations is found in drywells around tank TX-104 at a depth of 45 to 100 ft bgs, again with the higher contamination levels occurring at shallow depths toward the northeast. The presence of uranium contamination at these concentrations strongly indicates leakage of metal waste (MW) in the early 1950s. Refer to Figure 2-4 for uranium "plumes."

2.3 SURFACE GEOPHYSICAL EXPLORATION INFORMATION

Surface geophysical exploration (SGE) activities at TX Farm have included ground penetrating radar (GPR) (RPP-RPT-38104, *Surface Geophysical Exploration of TX-TY Tank Farms at the Hanford Site: Results of Background Characterization with Ground Penetrating Radar*), electromagnetics (terrain conductivity), total field magnetics, magnetic gradiometry (RPP-RPT-36893, *Surface Geophysical Exploration of TX and TY Tank Farms at the Hanford Site: Results of Background Characterization with Magnetics and Electromagnetics*), and electrical resistivity surveys (RPP-RPT-38320, *Surface Geophysical Exploration of the TX and TY Tank Farms at the Hanford Site*). RPP-RPT-38320 presents the results of an electrical resistivity survey completed in 2007. This work was comprised of a series of orthogonal two-dimensional (2D) resistivity lines across TX and TY Farms including the local cribs and trenches. In addition to the 2D resistivity survey lines, well-to-well (or long electrode) surveys were completed using the pre-existing tank farm drywells.

Figure 2-4. Waste Management Area TX-TY Elevated Gamma Data in Drywells Showing the Uranium, Cobalt-60, and Europium Plumes in Southern 241-TX Tank Farm.

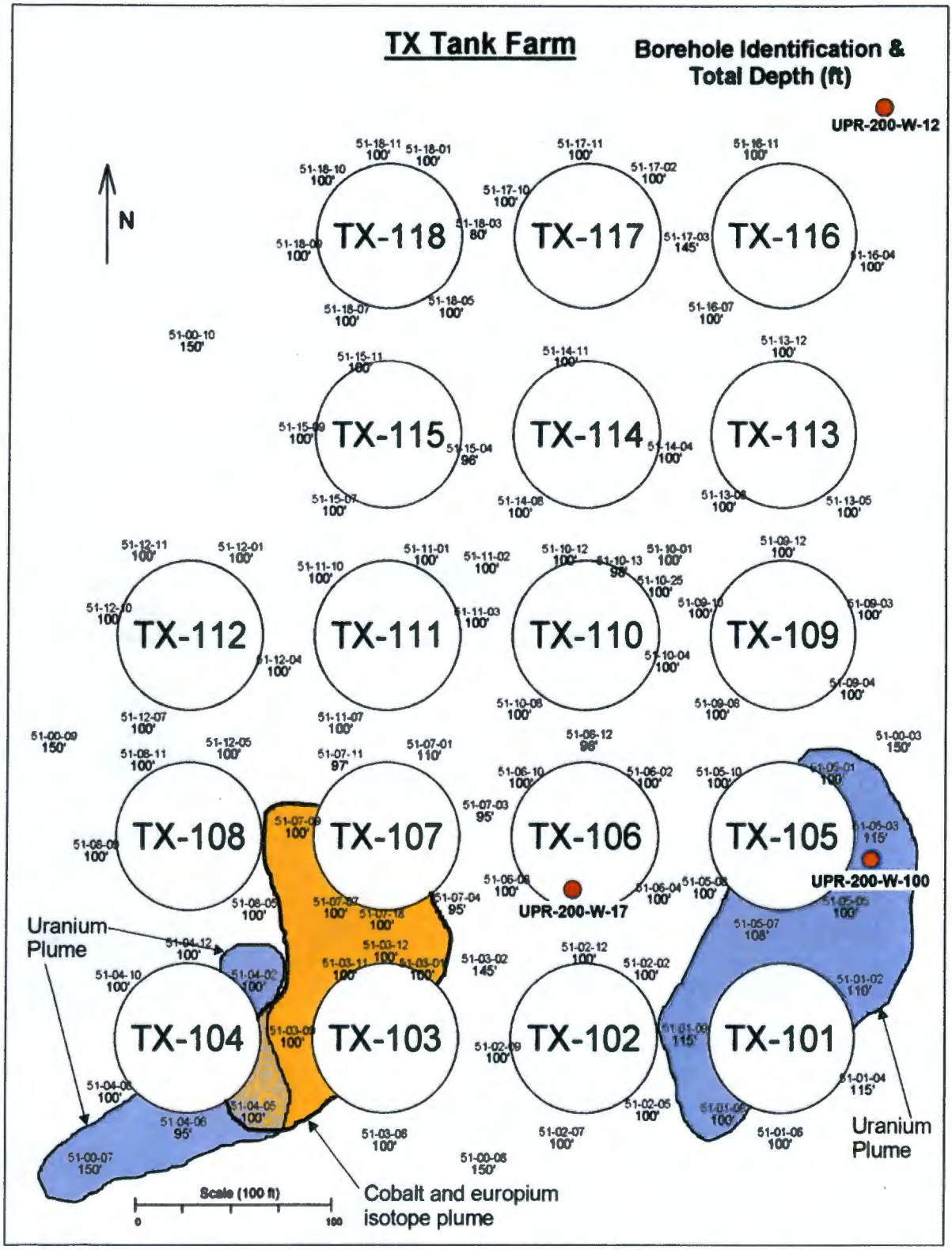


Figure 2-5 shows lower resistivity areas in red (1-41 Ohm-m) and green (42-54 Ohm-m), which indicates areas of increased ionic salts and soil moisture. Interpretation of gamma logging signatures from both the DOE Grand Junction Office (GJO) and the Nez Perce are overlain on the resistivity results. The combined image presents three areas where gamma logging and resistivity results are collocated. The occurrence of both gamma and resistivity signatures presents an increased likelihood of soil contamination as each method responds to different contamination characteristics. The three areas include: 1) north central extending northwest to southeast; 2) southwest; and 3) southeast.

The north central anomalies are in good agreement. However, these results appear to be responding to a signature that is very shallow in the soil column and may be a result of shine from transfer lines in the immediate vicinity. The location presented in the southwestern portion of Figures 2-4 and 2-5, associated with tank TX-104, initially appears to have very poor agreement; however, when looking at the individual constituents that make up the gamma anomalies in this region there is good agreement with the ^{238}U and ^{137}Cs anomalies, but ^{60}Co does not correlate well.

Radionuclides are not known to significantly affect resistivity imaging results; as such, the resistivity results are most commonly associated with increased salts and soil moisture content. Thus, the correlative nature of the two data sets is likely due to the common location of the release and associated waste stream components.

RPP-RPT-38320 also contained a summary of major cation, anion, and radionuclide discharges in TX Farm to assist in the overall interpretation of data collected by SGE. This discharge information was obtained from RPP-26744, *Hanford Soil Inventory Model, Rev. 1* and graphically presented in RPP-RPT-38320. The following is a summary of this information.

The major cations and anions discharged are:

- Calcium (0 to 10,000 kilograms)
- Chloride (0 to 2,000 kilograms)
- Chromium (0 to 500 kilograms)
- Nitrate (0 to 20,000 kilograms)
- Potassium (0 to 1,000 kilograms)
- Sodium (0 to 70,000 kilograms)
- Sulfate (0 to 1,500 kilograms).

The major radionuclides discharged are:

- Cesium-137 (0 to 750 curies)
- Strontium-90 (0 to 2 curies)
- Technetium-99 (0 to 0.5 curies)
- Total uranium (0 to 500 curies).

Figure 2-5. Resistivity in and around 241-TX Tank Farm, in Comparison to Two Interpretations of the Spectral Gamma Logging Results from 2000.

GJO = Grand Junction Office, Grand Junction, Colorado.

Note: The Nez Perce Tribe provided their interpretation of the spectral gamma logging results in and around 241-TX Tank Farm as part of the Surface Geophysical Exploration comparisons study completed in 2013. The black dotted lines indicate the aerial extent of the anomalies provided at that time (WRPS-56464-VA, *SGE Comparisons with other data sources*).

References: GJO-97-13 TAR/GJO-HAN-11, *Hanford Tank Farms Vadose Zone: TX Tank Farm Report.*
GJO-97-13-TARA/GJO-HAN-11, *Hanford Tank Farms Vadose Zone: Addendum to the TX Tank Farm Report.*

2.4 INTERIM MEASURES INVESTIGATION INFORMATION

The purpose of the interim measures investigation field work in TX Farm was to gather data to help determine if the conditions are such that an interim measure will be beneficial (e.g., reduce the rate of migration of contaminants in soil to groundwater or remove the mobile contaminants [reduce groundwater risk] in the near term). Field activities were conducted during 2013 and 2014 per RPP-PLAN-53808, RPP-ENV-53773, and RPP-PLAN-54376.

In order to determine if an interim measure would be effective, it is necessary to understand the geographic extent of subsurface soluble contaminant plumes. It is also important to understand whether the soluble contaminants are too deep in the vadose zone or too close to the groundwater for an interim measure (such as a barrier) to effectively reduce the risk and therefore the release of contaminants to the groundwater. In simple terms, the effective depth of the interim barrier is defined as the maximum depth at which a barrier is expected to reduce the migration rate of contaminants through the soil.

The effective depth of a surface barrier is dependent upon a number of factors. PNNL-18661, *Technical Basis for Evaluating Surface Barriers to Protect Groundwater from Deep Vadose Zone Contamination* indicates that the effectiveness of surface barriers is highly dependent on the complex interaction of site conditions, surface barrier design and performance features, and vadose zone contaminant conditions. Factors such as barrier design, barrier size relative to contamination depth and extent, and the method used for disposition of collected water all impact a barrier's effective depth. It is also worth noting that RPP-33431, *Design Analysis for T-Farm Interim Surface Barrier (TISB)* examined the depth of barrier effectiveness with numerical simulations and concluded that the maximum depth of impact for the 241-T Tank Farm ISB is ~164 ft (50 m) bgs.

Four main factors that help determine if an interim measure would be effective are:

- Soil properties
- Contaminant location
- Contaminant properties (i.e., mobility)
- Recharge rate.

RPP-43551, *Tank Farm Interim Barrier Data Quality Objectives* was established to help ensure that appropriate information is collected to determine: "Is mobile contamination present in the soil and, if present, does an interim barrier merit construction?" This report and the TX Farm data requirements document (RPP-ENV-53773) identify that the above factors are needed to help determine if a barrier is merited. These reports also identify that nitrate and ^{99}Tc are the most mobile constituents. In particular modeling indicates that, once released, these constituents move down vertically with some horizontal spreading (unless diverted horizontally by capillary barriers or low conductivity layers). For this reason, nitrate and ^{99}Tc have been identified as the primarily constituents to be considered in interim measure evaluations.

As per RPP-43551, the established action limit with respect to past barrier evaluation was 10 parts per million (μg/g) for nitrate and 2.5 pCi/g for ^{99}Tc. The action limit for nitrate

identified was based on "approximately three times soil background". These background results were from well 299-W10-27 that is drilled just east of TY Farm. Note that the site soil background concentration for nitrate is 52 µg/g (DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*). For the purposes of this evaluation (Section 2.4.2 of this report), the nitrate site soil background concentration will be used rather than the action limit in RPP-43551. The action limit for ^{99}Tc was based on approximately three times the detection limit of ^{99}Tc (0.85 pCi/g) from analyses conducted by Pacific Northwest National Laboratory. There is no site background concentration established for ^{99}Tc as it is not a naturally-occurring constituent, so the established action limit of 10 µg/g will be used in this reports evaluation process.

It is important to note that information collected needs to be evaluated collectively to determine if a barrier is merited. For instance as stated in RPP-43551, an interim barrier may not be constructed even if some of the ^{99}Tc and nitrate analyses are above the action limits. Consideration will need to be given to such things as depth, hydrogeology, and extent of mobile contamination.

2.4.1 Field Summary Information

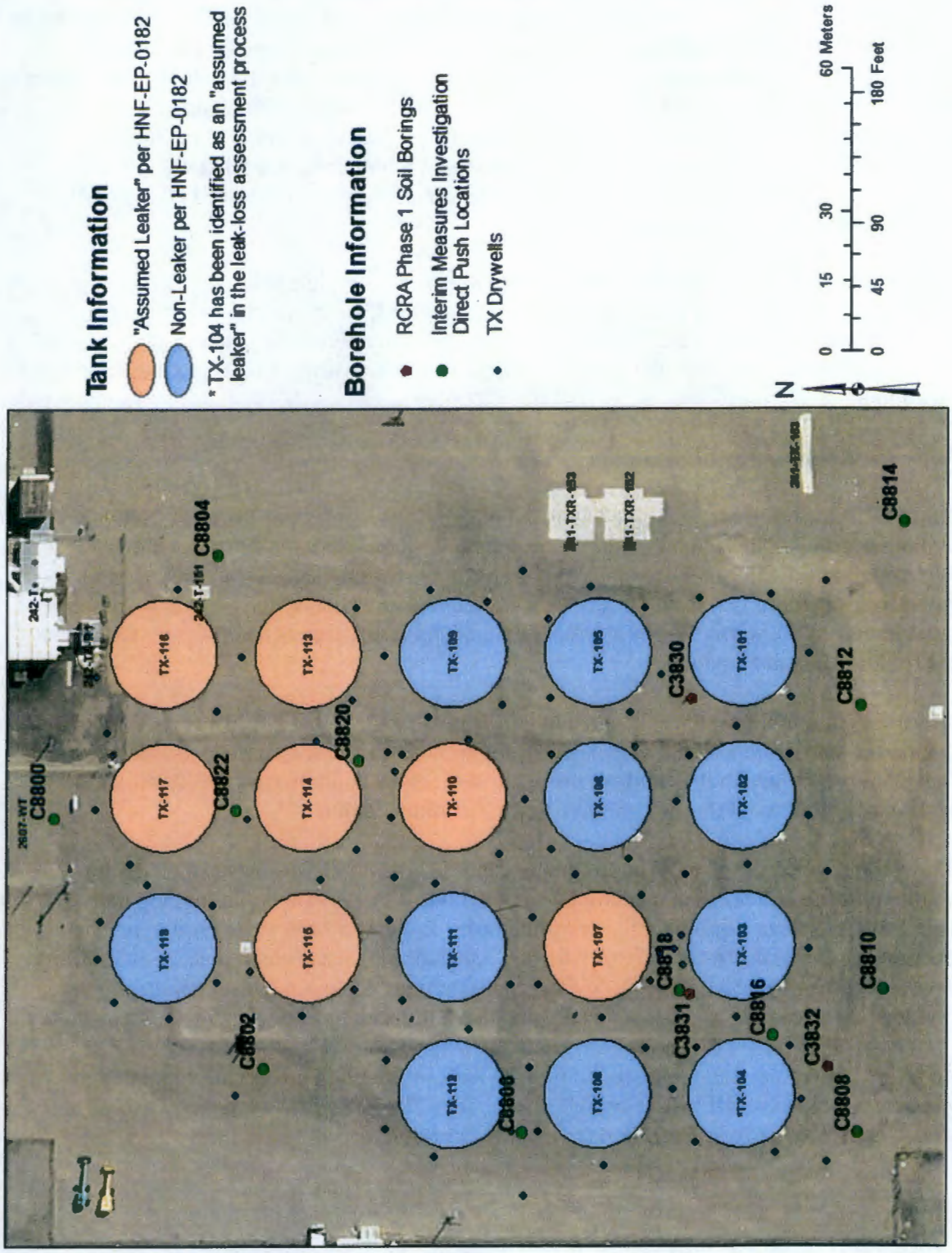
A total of 12 locations were sampled at an average of three depths per location. Sample locations are shown in Figure 2-6 and the rationale for the selection of these locations is documented in the sampling plan and sample selection meeting notes (Appendix C) and summarized in Table 2-1. Eight locations were selected to evaluate soil concentrations around the perimeter of TX Farm. The other four locations focused on areas inside of the farm around areas of known contamination.

Agreement on sample depths is documented in Appendix C. Table 2-2 identifies for each location the sample depths and associated stratigraphic unit. Note that most locations were sampled at two depths in the Hanford formation and at one depth in the Cold Creek unit. Appendix E contains chains of custodies for the sampling depths.

All locations were pushed to an approximate depth of 110 ft (33.5 m) bgs using a hydraulic hammer unit (i.e., direct push methodology). Each location consisted of a logging hole (spectral gamma and moisture logging) and a sampling hole. Logging results were used to help aid in the selection of sample depths and are provided in Appendix D. Deep electrodes for SGE efforts were installed in logging holes prior to decommissioning. Electrode placement depths are provided in Appendix F and decommissioning dates for each hole are provided in Appendix G.

The following completion report contains daily field information along with logging and sampling information: RPP-RPT-56877, *Fiscal Year 2013 Completion Report for the 241-TX Tank Farm Direct Push Barrier Characterization.*

Figure 2-6. Interim Measures Investigation Direct Push Locations.



RCRA = *Resource Conservation and Recovery Act of 1976*

Reference: HNF-EP-0182, *Waste Tank Summary Report for Month Ending March 31, 2014*, Rev. 315.

Table 2-1. Direct Push Locations for Interim Measures Investigation. (3 sheets)

Location #	Approximate Location	Input Factors Associated with Location[a] Reason for Sampling with Respect to Interim Measures Investigation[a]
C8814	Southeast of tank 241-TX-105 (TX-105)	• Tank TX-105 currently designated as a "leaker" • Nearby diversion boxes and pipelines • Process records indicate it was overfilled in 1952 and between 1961 and 1964 • Gross gamma activity detected in drywells 51-05-01, 51-05-03, and 51-05-05 on East – Southeast side of tank • UPR-200-W-100 is also to the east of tank TX-105 **Further assess the path and inventory of tank TX-105 and UPR-200-W-100 releases.**
C8812	Southwest of tank 241-TX-101	• Releases associated with tank TX-105 and UPR-200-W-100 appear to be trending to the southwest • Tc-99 groundwater plume is to the south of 241-TX Tank Farm (TX Farm) **Further assess the nature and depth of migration of releases near tank TX-105 and UPR-200-W-100; also attempt to define a boundary for the migration.**
C8810	South of tank 241-TX-103	• Tank 241-TX-107 currently designated as a "leaker" • Noted Co-60 and Eu-154 activity in drywells 51-07-07 and 51-07-18, and in drywells between tanks 241-TX-107 and 241-TX-103 • Tc-99 groundwater plume is to the south of TX Farm **Confirm Previous Results: Gather additional data to assist in determining nature and extent of contamination (i.e., Tc-99) south of the TX Farm tanks, also to attempt to define boundary to vadose zone contamination.**
C8808	South of tank 241-TX-104	• Tank 241-TX-104 currently designated as "sound" pending further evaluation • Uranium vadose zone plume to the east and south of tank 241-TX-104; may be the result of a transfer line or cascade line leak • Tc-99 groundwater plume is to the south of TX Farm **Confirm Previous Results: Gather additional data to assist in determining nature and extent of contamination (i.e., Tc-99) south of the TX Farm tanks, also to attempt to define boundary to vadose zone contamination.**
C8806	In between tanks 241-TX-108 and 241-TX-112 and slightly to the west of the centerline between these tanks	• Higher conductivity area based on resistivity information in this area **Explore surface geophysical exploration (SGE) anomaly close to tanks 241-TX-108 and 241-TX-112. Gather data to assist in determining nature and extent of contamination (i.e., Tc-99).**

Table 2-1. Direct Push Locations for Interim Measures Investigation. (3 sheets)

Location #	Approximate Location	Input Factors Associated with Location[a] Reason for Sampling with Respect to Interim Measures Investigation[a]
C8802	In between tanks 241-TX-115 (TX-115) and 241-TX-118 and to the NW of tank TX-115	• Tank TX-115 was declared "questionable integrity" in 1977 based on gamma activity in drywell 51-15-04 and arbitrarily assigned a leak volume of 8,000 gal • May have been overfilled in the early 1950s • SGE anomaly to the north and northwest of tank TX-115 **Explore SGE anomaly close to tanks TX-115 and 241-TX-118. Gather data to assist in determining nature and extent of contamination (i.e., Tc-99).**
C8800	North of tank 241-TX-117	• Tank 241-TX-117 was declared "questionable integrity" in 1977 based on gamma activity detected during scans of nearby vadose zone drywells and arbitrarily assigned a leak volume of 8,000 gal • Tc-99 in groundwater in this vicinity **Gather data to assist in determining nature and extent of contamination (i.e., Tc-99) and to attempt to define boundary to vadose zone contamination.**
C8804	East of tank 241-TX-113 and 241-TX-116	• Tank 241-TX-113 was declared "questionable integrity" in 1977 based on gamma activity detected during scans of nearby vadose zone drywells and arbitrarily assigned a leak volume of 8,000 gal • Historical transfer records show that tank 241-TX-113 was filled above the cascade outlet as a result of plugging of the cascade lines and in-tank photographs show the waste level was well above the cascade line, indicating the potential for releases from the cascade lines or spare inlet ports • Tank 241-TX-116 was declared "questionable integrity" in 1977 based on gamma activity detected during scans of nearby vadose zone drywells and arbitrarily assigned a leak volume of 8,000 gal **Gather data to assist in determining nature and extent of contamination (i.e., Tc-99) and to attempt to define boundary to vadose zone contamination.**
C8816	In between tanks 241-TX-104 and 241-TX-103 and slightly to the southeast of the centerline between these tanks	• Available data indicate that it might be an area with subsurface contamination of cesium, uranium or cobalt • Location near tank likely to have released contaminants to the soil column (241-TX-104) **Gather data to better define areas contaminated by tank waste and to assist in preliminary definition of areal extent of interim barrier (if deemed appropriate).**
C8818	In between tanks 241-TX-103 and 241-TX-107 and slightly to the east of the centerline between these tanks	• Available data indicate that it might be an area with subsurface contamination of cesium, uranium or cobalt • Location where ^{99}Tc concentrations may be sufficient for beta probe testing • Location near tank likely to have released contaminants to the soil column (241-TX-104 and 241-TX-107) **Gather data to better define areas contaminated by tank waste, to assist in preliminary definition of areal extent of interim barrier (if deemed appropriate), and to possibly test beta probe.**

Table 2-1. Direct Push Locations for Interim Measures Investigation. (3 sheets)

Location #	Approximate Location	Input Factors Associated with Location[a]
		Reason for Sampling with Respect to Interim Measures Investigation[a]
C8820	In between tanks 241-TX-110 and 241-TX-114 and slightly to the northeast of the centerline between these two tanks	• Location where ^{99}Tc concentrations may be sufficient for beta probe testing • Location near tank likely to have released contaminants to the soil column (241-TX-114) **Gather data to better define areas contaminated by tank waste, to assist in preliminary definition of areal extent of interim barrier (if deemed appropriate), and to possibly test beta probe.**
C8822	In between tanks 241-TX-114 and 241-TX-117	• Location near tank likely to have released contaminants to the soil column (241-TX-114) **Gather data to better define areas contaminated by tank waste and to assist in preliminary definition of areal extent of interim barrier (if deemed appropriate).**

[a] Support information is provided in RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan*, RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm*, and Appendix C of this report (Meeting Notes).

2.4.2 Analytical Results

Approximately 150 primary and secondary constituents were analyzed per the sampling plan requirements (refer to Tables 3-1 and 4-1 in the sampling plan). Per sampling plan requirements, secondary constituents were only reported by the 222-S Laboratory if their concentrations were detectable. Analytical results reside within the Hanford Environmental Information System (HEIS) database and are summarized in the following laboratory reports:

- RPP-RPT-56442, *Analytical Report for Soil Samples Taken in Support of Interim Measure Planning at the 241-TX-Tank Farm*
- RPP-RPT-57153, *Analytical Report for Soil Samples Taken in Support of Interim Measure Planning at the 241-TX-Tank Farm in 2014.*

Table 2-2. 241-TX Tank Farm Sample Depths and Completion Information.

Location (surface elevation ft amsl)	C8799/C8800 (672.8)	C8801/C8802 (672.49)	C8803/C8804 (672.5)	C8805/C8806 (672.79)	C8807/C8808 (672.46)	C8809/C8810 (672.8)	C8811/C8812 (676.5)	C8813/C8814 (671.5)	C8815/C8816 (673.72)	C8817/C8818 (674.38)	C8819/C8820 (675.13)	C8821/C8822 (674.15)
Date Logging Complete	9/26/13	8/23/13	9/30/13	7/31/13	8/7/13	6/26/13	6/26/13	7/15/13	1/28/14	1/30/14	2/5/14	2/5/14
Sample Depth Meeting Date	10/3/13	8/29/13*	10/3/14	8/15/13*	8/15/13*	7/18/13*	7/18/13*	7/18/13*	2/5/14**	2/5/14**	2/12/14**	2/12/14**
Sample Depth ft bgs [center depth in m bgs] (center depth ft amsl)	53.5-55.5 [16.6] (618.3)	51-53 [15.8] (620.49)	77-79 [23.8] (594.5)	56-58 [17.4] (615.79)	53-55 [16.5] (618.46)	60-62 [18.6] (611.8)	54-56 [16.8] (621.5)	56-58 [17.4] (614.5)	68-70 [21.0] (604.72)	59-61 [18.3] (614.38)	53-55 [16.5] (621.13)	50-52 [15.5] (623.15)
	71.5-73.5 [22.1] (600.6)	59-61 [18.3] (612.49)	90-92 [27.7] (581.5)	85-87 [26.2] (586.79)	84-86 [25.9] (587.46)	87-89 [26.8] (584.8)	70-72 [21.6] (605.5)	70-72 [21.6] (600.5)	74.5-76.5 [23.0] (598.22)	67-69 [20.7] (606.38)	83-85 [25.6] (591.13)	59-61 [18.3] (614.15)
	98-100 [30.2] (573.8)	101-103 [31.1] (570.49)	98-100 [30.2] (573.5)	101-103 [31.1] (570.79)	105-107 [32.3] (566.46)	102-104 [31.4] (569.8)	103-105 [31.7] (572.5)	92-94 [28.3] (578.5)	105-107 [32.3] (567.72)	103-105 [31.7] (570.38)	100-102 [30.8] (574.13)	101-103 [31.1] (572.15)
												107-109 [32.9] (568.15)
Total Depth - Logged Hole ft bgs (ft amsl)	105 (567.8)	108.5 (563.99)	104 (568.5)	108 (564.79)	111.5 (560.96)	111.3 (561.5)	113.3 (563.2)	107.9 (563.6)	114 (559.72)	112.55 (561.83)	110 (565.13)	109.1 (565.05)
Decommission Date Sample Location (Logging Location)	10/9/13 (10/22/13)	9/10/13 (9/12/13)	10/15/13 (10/23/13)	8/22/13 (9/16/13)	8/27/13 (9/11/13)	7/31/13 (9/4/13)	8/8/13 (8/29/13)	8/15/13 (8/18/13)	2/21/14 (TBD)	2/25/14 (TBD)	3/3/14 (TBD)	3/10/14 (TBD)

*Compiled in Fiscal Year 2013 Notes (Appendix C)
**Compiled in Fiscal Year 2014 Notes (Appendix C)

ft bgs = feet below ground surface, m bgs = meters below ground surface, ft amsl = feet above mean sea level

■ = Hanford formation 2 (H2) and No Shading = Cold Creek unit

In order to assist in evaluating the data from this investigation, analytical results were compared to soil background concentrations. Of the ~150 constituents, 27 were detected above soil background concentration levels (refer to Table 2-3 and Figures 2-7 through 2-9). Some general points of interest with respect to Table 2-3:

- Phosphate, antimony, chromium, and molybdenum are the constituents with the most exceedances (most number of locations and most number of samples with exceedances)
- C8818 is the location with the most constituents having maximum concentrations above background (i.e., seven constituents)
- C8808 is the location with maximum uranium isotope exceedances (i.e., ^{234}U, ^{235}U, and ^{238}U).

Figures 2-7 through 2-9 show the following.

- The 12 locations and the associated sample depths and stratigraphic units for each location:
  - Green shows the first sample depth (shallowest sample depth)
  - *Italicized* shows the second sample depth
  - A box around shows the third sample depth
  - **Bold** shows the fourth sample depth.
- The constituents for each location that had concentrations exceeding background concentrations/limits. The associated depth for each exceedance is also shown by the above notations (e.g., green, italicized, etc). Multiple depths having exceedances can be shown by using a combination of the notations (e.g., both green and italicized would mean the constituent exceeded background concentrations at the first and second sample depth).

Figure 2-7 shows the general chemistry constituents with background exceedances, Figure 2-8 shows the metals with background exceedances, and Figure 2-9 shows the radionuclide constituents with background exceedances.

Table 2-3. Constituents with Concentrations above Background in 241-TX Tank Farm. (2 sheets)

Constituent[a]	Background Value	Minimum Concentration above Background	Maximum Concentration above Background	Total # of Samples with Background Exceedances (out of 37)	Total # of Locations with Background Exceedances (out of 12)	Location with Maximum Concentration (Depth of Maximum Concentration in ft bgs)
	µg/g					
Fluoride	2.81	2.9	3.8	3	3	C8822 (60)
Nitrate	52	80.6	964	10	3	C8818 (60)
Phosphate *Essential Nutrient*	0.785	0.859	31.1	33	12	C8818 (68)
Aluminum	11,800	12,400	17,700	12	12	C8812 (104)
Antimony	0.13	0.141	0.623	28	10	C8812 (71)
Arsenic	6.47	6.85	10.4	12	10	C8806 (102)
Barium	132	142	142	1	1	C8822 (102)
Calcium *Essential Nutrient*	17,200	165,000	165,000	1	1	C8822 (108)
Chromium	18.5	18.9	47.1	31	12	C8814 (93)
Lead	10.2	10.6	14.8	8	8	C8806 (102)
Lithium	13.3	13.4	21.8	21	12	C8812 (104)
Magnesium *Essential Nutrient*	7,060	7,120	9,740	10	9	C8822 (108)
Mercury	0.013	0.0137	0.0137	1	1	C8814 (57)
Molybdenum	0.47	0.524	1.98	30	11	C8804 (78)
Nickel	19.1	19.3	35.1	14	7	C8800 (54.5)
Potassium *Essential Nutrient*	2,150	2,330	2,850	9	9	C8812 (104)
Selenium	0.78	0.819	0.957	2	2	C8804 (78)

Table 2-3. Constituents with Concentrations above Background in 241-TX Tank Farm. (2 sheets)

Constituent[a]	Background Value	Minimum Concentration above Background	Maximum Concentration above Background	Total # of Samples with Background Exceedances (out of 37)	Total # of Locations with Background Exceedances (out of 12)	Location with Maximum Concentration (Depth of Maximum Concentration in ft bgs)
	µg/g					
Sodium *Essential Nutrient*	690	2,070	2,070	1	1	C8818 (60)
Thallium	0.185	0.195	0.293	7	6	C8802 (102)
	pCi/g					
Cobalt-60	0.0084	0.455	19.2	4	2	C8818 (60)
Plutonium-238	0.0038	0.114	0.114	1	1	C8818 (60)
Plutonium-239/240	0.025	3	3	1	1	C8818 (60)
Strontium-90	0.18	0.194	73.4	5	4	C8814 (57)
Thorium-232 *Naturally occurring background radiation*	1.3	2.9	2.9	1	1	C8820 (54)
Uranium-234	1.1	6.06	9.96	2	1	C8808 (106)
Uranium-235	0.11	0.294	0.294	1	1	C8808 (106)
Uranium-238	1.1	1.55	6.62	4	3	C8808 (106)

[a]Background concentrations are defined in DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides* and ECF-HANFORD-11-0038, *Soil Background for Interim Use at the Hanford Site.*

[b]Strontium-90 and Plutonium-239/240 are anthropogenic radionuclides whose background values only apply to surface soil samples.

ft bgs = feet below ground surface

Figure 2-7. Interim Measure Investigation Locations with General Chemistry Background Soil Exceedances.

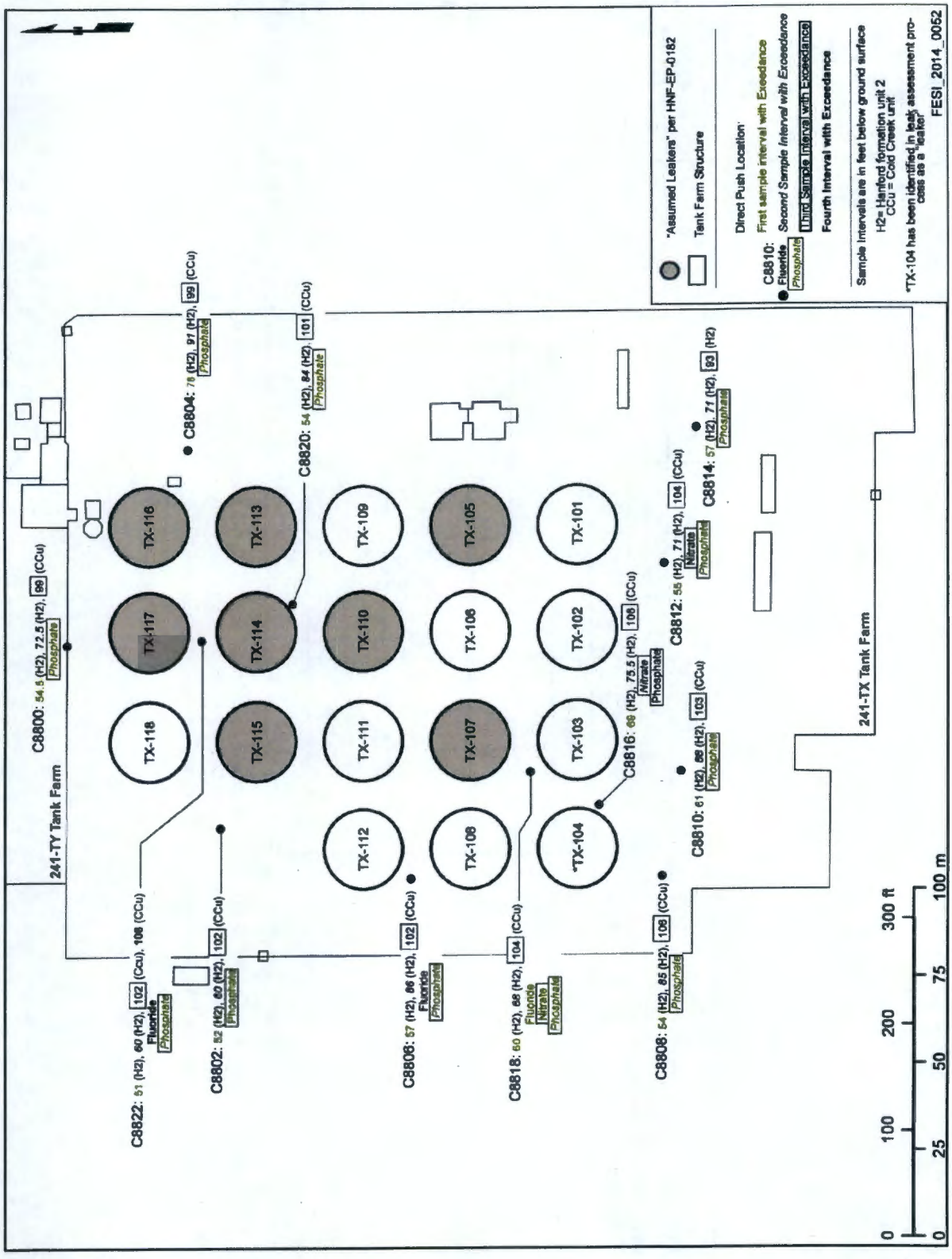


Figure 2-8. Interim Measure Investigation Locations with Metals Background Soil Exceedances.

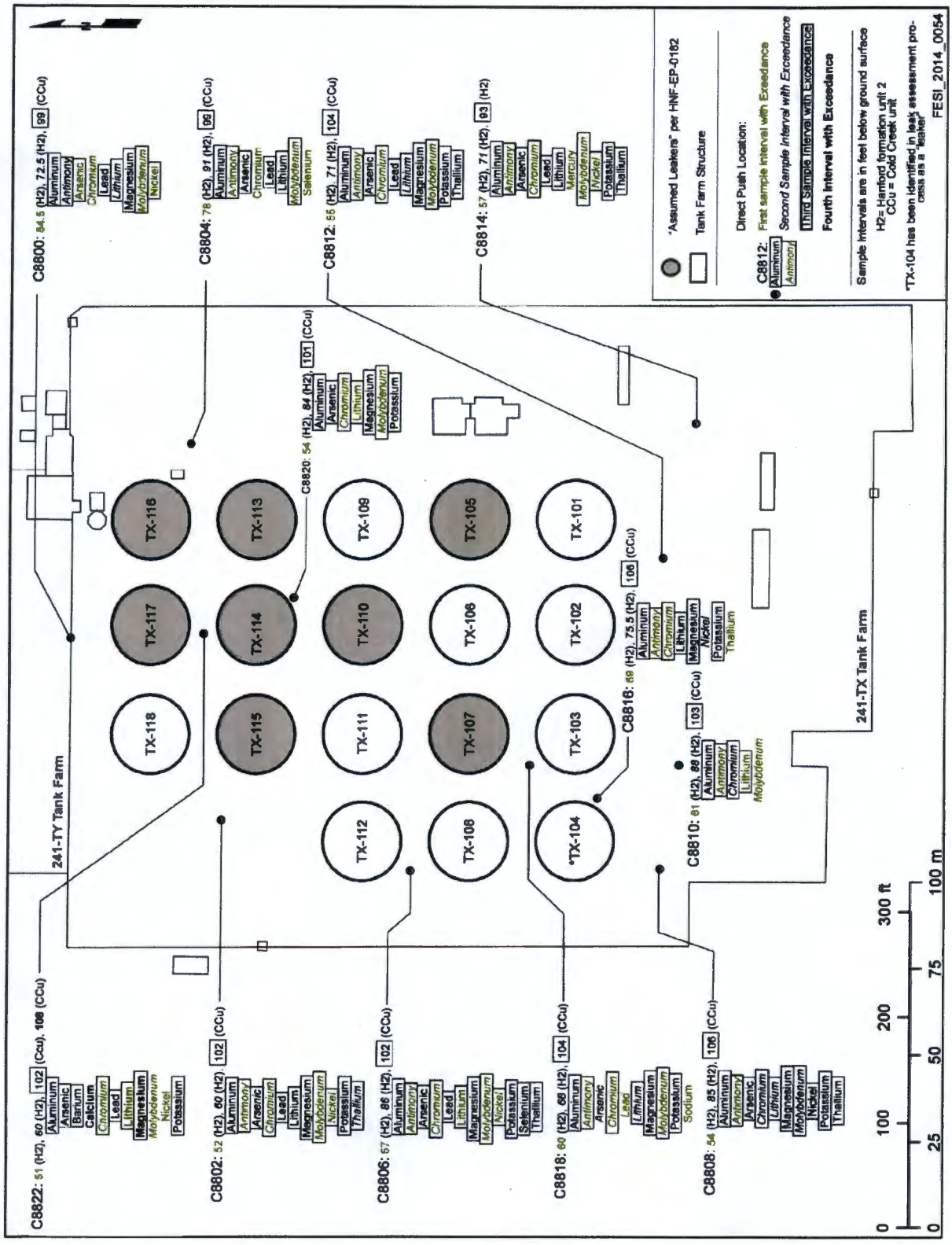
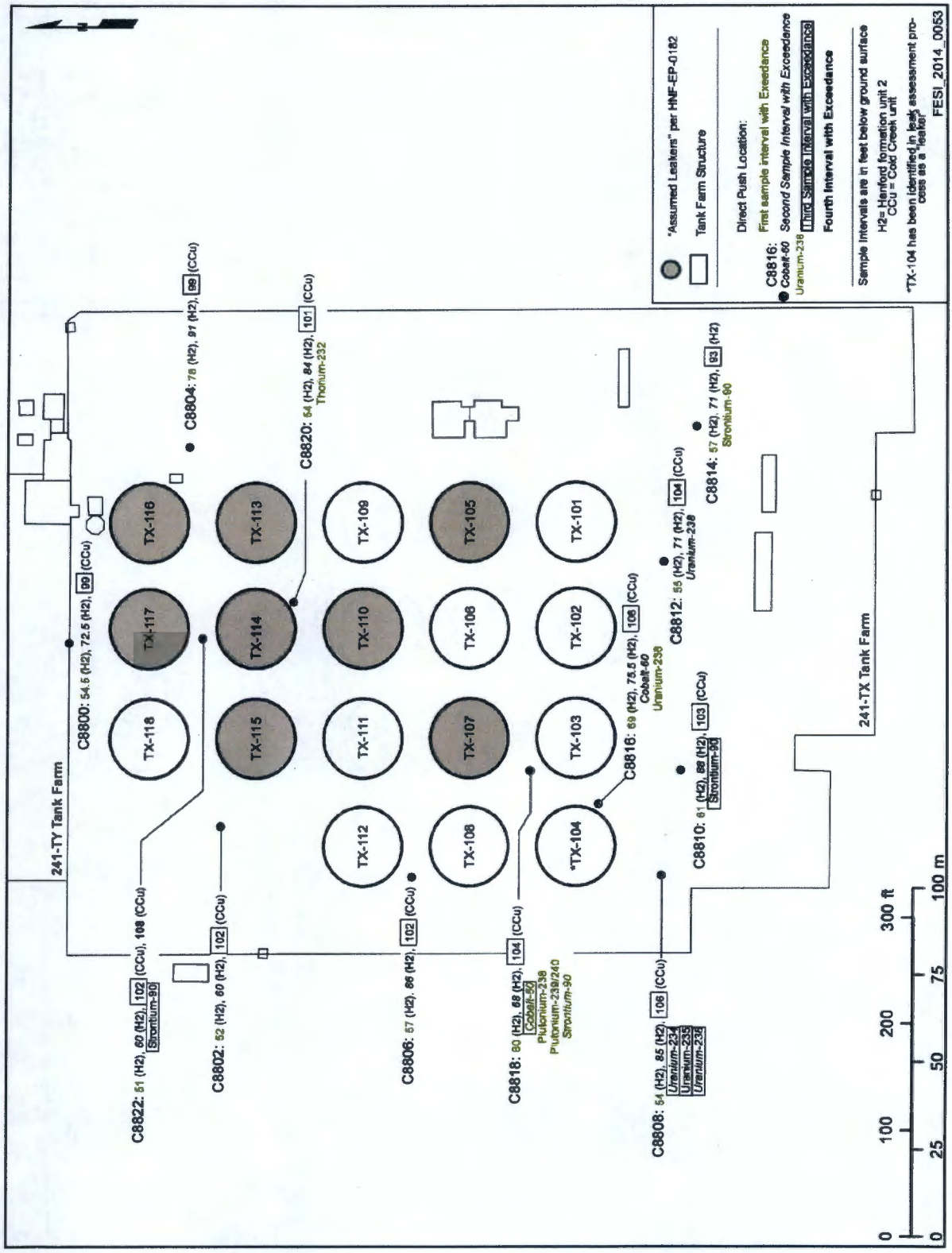


Figure 2-9. Interim Measure Investigation Locations with Radiological Constituents Background Soil Exceedances.



After review of Table 2-3 and Figures 2-7 through 2-9, C8818, which is northwest of tank TX-103 and southwest of tank TX-107, is the location that has the most constituents with concentrations above background (17 constituents from the 27 constituents detected above background) and is the location with the most maximum concentrations (i.e., seven constituents in Table 2-3). The constituents with the maximum concentrations from C8818 are as follows (parenthetic identifies the depths exceedance occurred and highlighted indicates depth with maximum concentration):

- Nitrate (depths of 60 and 100 ft [18.3 to 30.5 m] bgs)
- Phosphate (depths of 60, 68, and 104 ft [18.3, 20.7, and 30.5 m] bgs)
- Sodium (depth of 60 ft [18.3 m] bgs)
- Cobalt-60 (depths of 60, 68, and 104 ft [18.3, 20.7, and 31.7 m] bgs)
- Plutonium-238 (depth of 60 ft [18.3 m] bgs)
- Plutonium-239/240 (depth of 60 ft [18.3 m] bgs).

Note: Table 2-3 identifies that $^{239/240}$Pu is an anthropogenic radionuclide whose background values only apply to surface soil samples, as is the case of ^{137}Cs and ^{90}Sr. For information purposes, these constituents are evaluated at all depths.

C8818 also had the highest pH results 9.88 at 60 ft (18.3 m) bgs and 9.86 at 68 ft (20.7 m) bgs. The deepest sample interval of 104 ft (31.7 m) had a pH of 8. Additionally, C8818 had the highest specific conductance readings of 3,340 µS/cm at 60 ft bgs and 1,030 µS/cm at 104 ft bgs. The specific conductance at the 68 ft (20.7 m) bgs interval was ~350 µS/cm.

It should be identified that all constituents do not have an associated background concentration (e.g., they do not naturally occur and therefore background concentrations were not determined). Technetium-99 is one of the constituents associated with tank waste/leaks but does not have a soil background concentration. Table 2-4 summarizes the detectable ^{99}Tc concentrations for the 12 locations sampled. Again, C8818 had the highest and second highest concentrations:

- 422 pCi/g (acid extract) and 351 pCi/g (water extract) at 60 ft (18.3 m) bgs
- 112 pCi/g (acid extract) and 101 pCi/g (water extract) at 104 ft (31.7 m) bgs.

The 68 ft (20.7 m) bgs interval at this location had very low ^{99}Tc concentrations: not detectable (acid extract) and 2 pCi/g (water extract). The remaining locations that had detectable technetium concentrations had concentrations below 20 pCi/g.

Table 2-4 shows that nine of the 12 locations had detectable ^{99}Tc concentrations (21 of the 74 analysis results were detected). The following provides a breakdown of the detectable ^{99}Tc results:

- 9 of the 21 results were less than 2.5 pCi/g (the interim measure evaluation action limit identified in RPP-43551)

- 7 of the 21 results ranged between 6 and 30 pCi/g
- 4 of the 21 results were greater than 100 and less than 425 pCi/g (all results from C8818 as identified above).

Table 2-4. Detectable Technetium-99 Concentrations.

Location #[a]	Average Sample Depth (ft bgs)	Technetium-99 Concentration (pCi/g)[b]	Preparation Method	Corresponding NON-DETECTABLE Technetium-99 Concentration (pCi/g) for other Preparation Method at the same Sample Depth (Preparation Method)[c]
C8800	99	[redacted]	Acid	0.122 U (Water)
C8806	57	0.169	Water	10.6 U (Acid)
C8808	85	0.3	Water	10.8 U (Acid)
	106	0.21	Water	10.9 U (Acid)
C8810	88	1.21	Water	10.3 U (Acid)
	103	0.338	Water	10.1 U (Acid)
C8812	104	[redacted]	Water	NA
		[redacted]	Acid	
C8816	69	1.77	Water	12.6 U (Acid)
	75.5	[redacted]	Water	NA
		28.6	Acid	
	106	[redacted]	Water	12.4 (Acid)
C8818	60	351	Water	NA
		422	Acid	
	68	2.04	Water	12.6 U (Acid)
	104	101	Water	NA
		112	Acid	
C8820	84	0.251	Water	12.5 U (Acid)
	101	[redacted]	Water	12.5 U (Acid)
C8822	102	0.729	Water	12.2 U (Acid)
	108	0.256	Water	12.5 U (Acid)

[a] Shading indicates locations are inside 241-TX Tank Farm (i.e., last four locations pushed).

[b] Yellow = Concentrations greater than 100 pCi/g and less than 425 pCi/g.
Blue = Concentrations ranged between 6 and 30 pCi/g.
Both Yellow and Blue are concentrations above the interim measure evaluation action limit of 2.5 pC/g for technetium-99 as identified in RPP-43551, *Tank Farm Interim Barrier Data Quality Objectives*.

[c] NA = Not applicable.

In general, Table 2-4 shows that ^{99}Tc concentrations are not consistently detected in the area where samples were collected, but appear to be more prevalent around tanks TX-103 and TX-107.

Cesium-137, ^{129}I, ^{154}Eu and ^{155}Eu, which are constituents associated with tank waste/leaks, were not detected in any of the samples collected for this investigation. Note that the detection limits achieved by the laboratory for ^{154}Eu and ^{155}Eu were above the associated background limits; however, they were below those required detection limits identified in the sampling plan. A discussion will be had with 222-S Laboratory to see if they can lower their detection limit in the future. Additionally, some detection limits for ^{60}Co, ^{238}Pu and $^{239/240}Pu$, ^{90}Sr, and ^{234}U were above background limits. Again, this will be discussed with 222-S Laboratory; however, it appears that plan requirements were met and detection limits were either above the background limits in the sampling plan or the laboratory needed to dilute samples to perform analysis.

2.5 SUMMARY OF GROUNDWATER INFORMATION

As identified in Section 1.0, the purpose of this report is to provide a summary on vadose zone characterization. For informational purposes, the following is a brief summary on groundwater information.

At WMA TX-TY, the upper portion of the uppermost aquifer is contained in the Ringold Formation. In the vicinity of TX Farm, the top of the saturated zone is ~235 ft (72 m) bgs and the base (top of the Columbia River Basalt Group) is ~495 ft (151 m) bgs. The direction of current groundwater flow is southeasterly (eventually turning east to the river) in the southern portion of the 200 West Area, while it is north and northeast (through Gable Gap) in the northern portion of the 200 West Area. Note that DOE/RL-2013-22, *Hanford Site Groundwater Monitoring Report for 2012* reports that the groundwater flow direction and rate at WMA TX-TY are influenced by the 200 West pump-and-treat system. Specifically, groundwater flow direction on the northeast side of TX Farm is east, northeast towards the pump-and-treat extraction well on the northeast side of TX Farm; northwest on the northwest corner toward the extraction well on the southwest side of TY Farm; and south, southwest towards the extraction well on the southwest corner of TX Farm.

RPP-RPT-50870 and annual groundwater reports identify the following constituents as being consistently observed in a number of wells immediately down gradient of WMA TX-TY (the potential sources of these constituents' concentrations are identified in parentheses):

- Technetium-99 (past leaks from SSTs and pipelines and waste disposal from plutonium processing operations to cribs and trenches adjacent to WMA TX-TY)

- Chromium (past leaks from SSTs containing metal and liquid waste from chemical processing of uranium-bearing, irradiated reactor fuel rods, the bismuth phosphate [$BiPO_4$] process, uranium-recovery process, and from REDOX and Plutonium Uranium Extraction [PUREX] plant operations)

- Iodine-129 (past leaks from SSTs containing metal and liquid waste from chemical processing and plant operations to liquid waste disposal facilities [e.g., cribs and trenches] adjacent to tank farms)

- Nitrate (liquid waste disposal from Plutonium Finishing Plant [PFP] processes to the cribs near WMA T and the 216-Z Cribs and Trenches)

- Tritium (active permitted discharges at the State-Approved Land Disposal Site [SALDS], liquid waste from plutonium processing to disposal facilities, including 216-T-25 Trench, and past leaks from tanks and pipelines adjacent to WMA TX-TY).

Additionally, RPP-PLAN-53808 identified that of all the farms, TX Farm has the largest inventory of ^{99}Tc, ^{129}I, and nitrate that may impact groundwater (2,523 curies, 2.65 curies, and 13,287,900 kilograms, respectively). This information was obtained by assessing the Best Basis Inventory database. The inventory was downloaded from the Tank Waste Information Network on April 10, 2012, with the radionuclides decayed to January 1, 2008. The inventory of groundwater-impacting constituents was summed to calculate a percentage of those contaminants (^{99}Tc, ^{129}I, chromium, nitrite, nitrate, and uranium) for each tank farm over the total inventory.

3.0 CONCLUSIONS AND RECOMMENDATION

As identified in Section 1.0, the purpose of this report is to provide a vadose zone characterization summary for TX Farm to be submitted to Ecology to meet HFFACO Target M-045-22-T01. This characterization report is considered a secondary document and focuses on the information collected per the following documents:

- RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan* (HFFACO Milestone M-045-20)
- RPP-ENV-53773, *Data Requirements for Characterization Supporting Interim Measures in TX Farm*
- RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* (HFFACO Milestone M-045-21).

This characterization report also provides summary level information regarding previous characterization efforts and general information about TX Farm including leak assessment summary.

As identified in this report, several field investigations have been performed in TX Farm to gather information on the vadose zone. Investigations have comprised of collecting soil samples, logging data (gamma, neutron, and moisture), and resistivity information. Analytical data from the soil samples along with the other information have been compiled to characterize the vadose zone in the farm. As indicated from the subsequent sections, there is contamination in the TX Farm vadose zone as to be expected based on past practices and identified leaking tanks.

Table 3-1 provides summary information for some of the key constituents associated with tank waste and leaks along with a summary of field activities performed in TX Farm and the associated summary of findings. Overall, the various field activities have concluded that the area around tanks TX-107 and TX-103 is an area where contamination is consistent at sampling depths and at higher concentration levels.

Based on the 12 locations sampled for the interim measures investigation, 27 constituents have concentrations above background concentrations and some of these constituents are considered essential nutrients, naturally-occurring background radiation, or anthropogenic radionuclides (refer to Table 2-3). The concentrations associated with the constituents in Table 2-3 are likely the result of tank leaks or from waste processes. For the most part, background exceedances and/or detectable concentrations of constituents without background levels do not appear to be consistent in the farm or at levels that appear to be a concern for which an interim measure should be implemented. The exception to this is in the area southwest of tank TX-107 (northwest of tank TX-103). The ^{99}Tc concentrations from C8818 range from 100 to 400 pCi/g (100 pCi/g at 104 ft (32 m) bgs in the Cold Creek unit). Of all the locations sampled as a part of this investigation, this location also had the maximum concentration for several other constituents (nitrate, phosphate, sodium, ^{60}Co, and ^{238}Pu, $^{239/240}$Pu).

As previously identified, several factors can potentially affect the effectiveness of an interim measure (e.g., contaminant location, contaminant properties). The depth of barrier effectiveness is very important to determining whether it would be of benefit to install an ISB. In the TX Farm area, available information has indicated that the effectiveness of an ISB would be about 164 ft (50 m) bgs with respect to ^{99}Tc concentrations.

Overall, significant concentrations of mobile contaminants were seen at C8818 between 60 and 104 ft bgs (deeper locations were not sampled). In conclusion, based on the depth of contamination and levels of contamination, the only area in TX Farm where an ISB might be of benefit, to limit the impact of contamination already in the vadose zone, is in the limited area southwest of tank TX-107 (northwest of tank TX-103).

Table 3-1. Summary of 241-TX Tank Farm Sampling and Inventory Information.

Constituent	Inventory that May Impact Groundwater[a]	Peak Groundwater Concentrations[b]	Field Activity			
			Resource Conservation and Recovery Act of 1976 Phase 1 Soil Sampling[c] Location: Maximum Concentration (Depth of Maximum Concentration)	Dry Well Logging[d]	Surface Geophysical Exploration[e] Mass Discharged	Interim Measures Investigation Direct Push Soil Sampling[f] Location: Maximum Concentration (Depth of Maximum Concentration)
Chromium	51,254 kilograms	≥48 µg/L and <480 µg/L	Not Notable	NA	0-500 kilograms	C8814: 47.1 µg/g (93 ft bgs)
Nitrate	13,287,900 kilograms	≥45 mg/L and <450 mg/L	C3830: 84 µg/g (78-87 ft bgs) C3831: 866 µg/g (86 ft bgs) C3832: 98 µg/g/g (78-87 ft bgs)	NA	0-20,000 kilograms	C8818: 964 µg/g (60 ft bgs)
^{129}I	2.65 curies	≥1 pCi/L and <10 pCi/L	Not Notable	NA	NA	No Detected Concentrations
^{99}Tc	2,523 curies	≥900 pCi/L	C3830: 11 pCi/g (78-87 ft bgs) C3831: 137 pCi/g (60-61 ft bgs) C3832: 12 pCi/g (105-115 ft bgs)	Associated ^{60}Co plume by tanks 241-TX-103/241-TX-107	0-0.5 curies	C8818: 422 pCi/g acid prep (60 ft bgs)
Uranium	64,549 curies	NA	C3830: 0.94 pCi/g (67 ft bgs) C3831: 0.02 pCi/g (67 ft bgs) C3832: 0.91 pCi/g (75-110 ft bgs)	Plumes around tanks 241-TX-101/241-TX-105 and 241-TX-104	0-500 curies	C8808: ^{238}U, 6.62 pCi/g (106 ft bgs)

[a]Refer to RPP-PLAN-53808, *200 West Area Tank Farms Interim Measures Investigation Work Plan*, Figure 2-5.

[b]Refer to DOE/RL-2013-22, *Hanford Site Groundwater Monitoring Report for 2012*.

[c]Refer to Figure 2-1 for boring location. Note C3830 is between tanks 241-TX-101 and 241-TX-105, C3831 is between tanks 241-TX-103 and 241-TX-107, and C3832 is south of tank 241-TX-104. Note: Uranium in µg/g was multiplied by 0.336 to get units of pCi/g.

[d]Refer to Figure 2-4.

[e]Low resistivity and high moisture areas are tanks 241-TX-101/241-TX-105, 241-TX-103/241-TX-107, and 241-TX-114 (refer to Figure 2-5). Refer to RPP-RPT-38320, *Surface Geophysical Exploration of the TX and TY Tank Farms at the Hanford Site* for mass discharged.

[f]Refer to Figure 2-6 for sampling locations and Table 2-3, Table 2-4, and Figures 2-7 through 2-9 for sampling results.

ft bgs = feet below ground surface NA = Not available or Not applicable

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APPENDIX A

GEOLOGIC SUMMARY INFORMATION

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APPENDIX A

GEOLOGIC SUMMARY INFORMATION

The geology of the 241-T, TX, and TY Tank Farms and vicinity is well understood as a result of several decades of site characterization activities. It has been described in numerous reports (ARH-LD-135, *Geology of the 241-T Tank Farm*; ARH-LD-136, *Geology of the 241-TX Tank Farm*; ARH-LD-137, *Geology of the 241-TY Tank Farm*; RHO-ST-23, *Geology of the Separation Areas, Hanford Site, South-Central Washington*; PNL-6820, *Hydrogeology of the 200 Areas Low-Level Burial Grounds – An Interim Report*, Volume 1; PNL-7336, *Geohydrology of the 218-W-5 Burial Ground, 200 West Area*; WHC-SD-EN-TI-019, *Hydrogeologic Model for the 200 East Groundwater Aggregate Area*; GJO-97-13-TAR/GJO-HAN-11; RPP-8531, *Vadose Zone Geology of Boreholes 299-W10-27 and 299-W11-39 T-TX-TY Waste Management Area Hanford Site, South-Central Washington*; RPP-7123, *Subsurface Conditions Description of the T and TX-TY Waste Management Areas*). The main source of information about geologic strata underlying the Hanford Site and the tank farms is data from the drilling of boreholes and the analyses of the sediments and contaminants within them.

Four major stratigraphic units underlie the 241-T, TX, and TY Tank Farms (in ascending order) include the following:

- Igneous Columbia River Basalt Group
- Miocene- to Pliocene-age Ringold Formation (including members of Taylor Flats [R_{tf}] and members of Wooded Island [R_{wi}])
- Cold Creek unit (including subunits CCU_u and CCU_l)
- Hanford formation (including subunits H1 and H2).

East-West and North-South cross sections are given in Figures A-1 and A-2, respectively, which show the general layout of the sedimentary units underlying the tank farms. Of these, the backfill, Hanford formation, Cold Creek unit, and the upper portion of the Ringold Formation make up the vadose zone. The unconfined aquifer is contained within the lower portion of the Ringold Formation. All major stratigraphic units are inferred to be essentially continuous in this area, although unit thicknesses vary and some subunits are not present at a few boreholes. Waste Management Area TX-TY was constructed within the Cold Creek syncline and sits on the northern limb of the syncline, the major units to dip gently west to southwest toward the axis of the Cold Creek syncline.

General characteristics of each unit descending from the surface down beneath WMA TX-TY are as follows.

- **Hanford formation**. The Hanford formation is a cataclysmic flood deposit that is between 75 and 100 ft (22.9 and 30.5 m) thick and thickens slightly towards the south and west. It consists of two subunits (H1 and H2) that are distinguished by a distinct

change in the dominant particle size distribution. The upper H1 unit, deposited in a high-energy environment, is gravel-dominated and composed of poorly sorted basaltic, sandy gravels to silty sandy gravels. It is between 25 and 70 ft (7.6 and 21.3 m) thick in the area. The lower H2 unit, deposited in a lower-energy environment, is a sand-dominated sequence, composed of mostly horizontal to tabular cross-bedded sands to gravelly sands. Thin silt lenses are occasionally present that occur on a scale too small to correlate between boreholes. It is between 14 and 60 ft (4.3 and 18.3 m) thick in the area.

- **Cold Creek Unit**. The Cold Creek unit (referred to in previous documents as the Plio-Pleistocene unit) is a calcite-rich paleosol generated by surficial weathering events in a semiarid environment that is between 20 and 35 ft (6.1 and 10.7 m) thick. It consists of two subunits, CCU_u and CCU_l. The upper subunit (CCU_u) is a silty sequence, consisting of interstratified, well-sorted silts and fine sands, and contains a relatively high concentration of natural gamma-emitting isotopes. This subunit is sometimes difficult to distinguish from the overlying H2 subunit because of lithologic similarities. The lower subunit (CCU_l) consists of interbedded layers of pedogenically altered to unaltered gravel, sand silt, and/or clay cemented together with one or more layers of secondary calcium carbonate, often referred to as caliche. It is mostly between 10 and 25 ft (3.0 and 7.6 m) thick in the area.

- **Ringold Formation**. The Ringold Formation was formed as fluvial-lacustrine deposits on top of the last basalt flow. The depth of the Ringold Formation is not well known locally because most nearby boreholes have not been drilled deeply enough to reach the basalt bedrock. However, regional data suggest a total thickness of ~375 ft (115 m). Two subunits, member of Taylor Flats (R_{td}) and member of Wooded Island (R_{wi}), are present here. The upper subunit (R_{td}) ranges between 0 and 30 ft (0 and 9.1 m), thickens to the north, and is a fine-grained sequence consisting of interstratified, well-bedded fine to coarse sands to silts. The lower subunit (R_{wi}) is, for the most part, a coarse-grained sequence consisting of mostly moderately sorted, quartzitic sandy gravel to silty sandy gravel. Within this sequence of coarse sediments, a distinct high-silt rich layer, the lower mud unit, occurs ~275 ft (85 m) below the top of the Ringold Formation. Although few local boreholes reach this depth, regional data suggest this unit is largely continuous in the area and is considered to be sufficiently impermeable to be the bottom boundary of the unconfined aquifer.

Figure A-1. East-West Hydrogeologic Cross Section A-A' across the 241-TX Tank Farm.

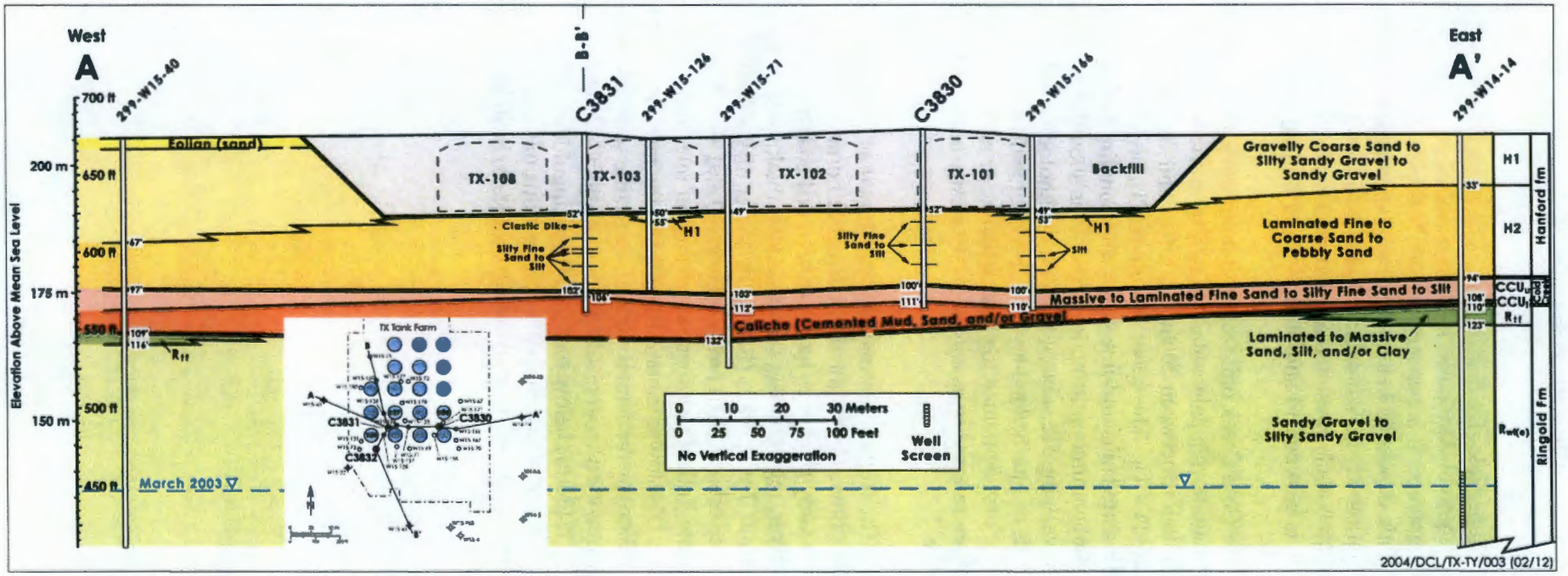
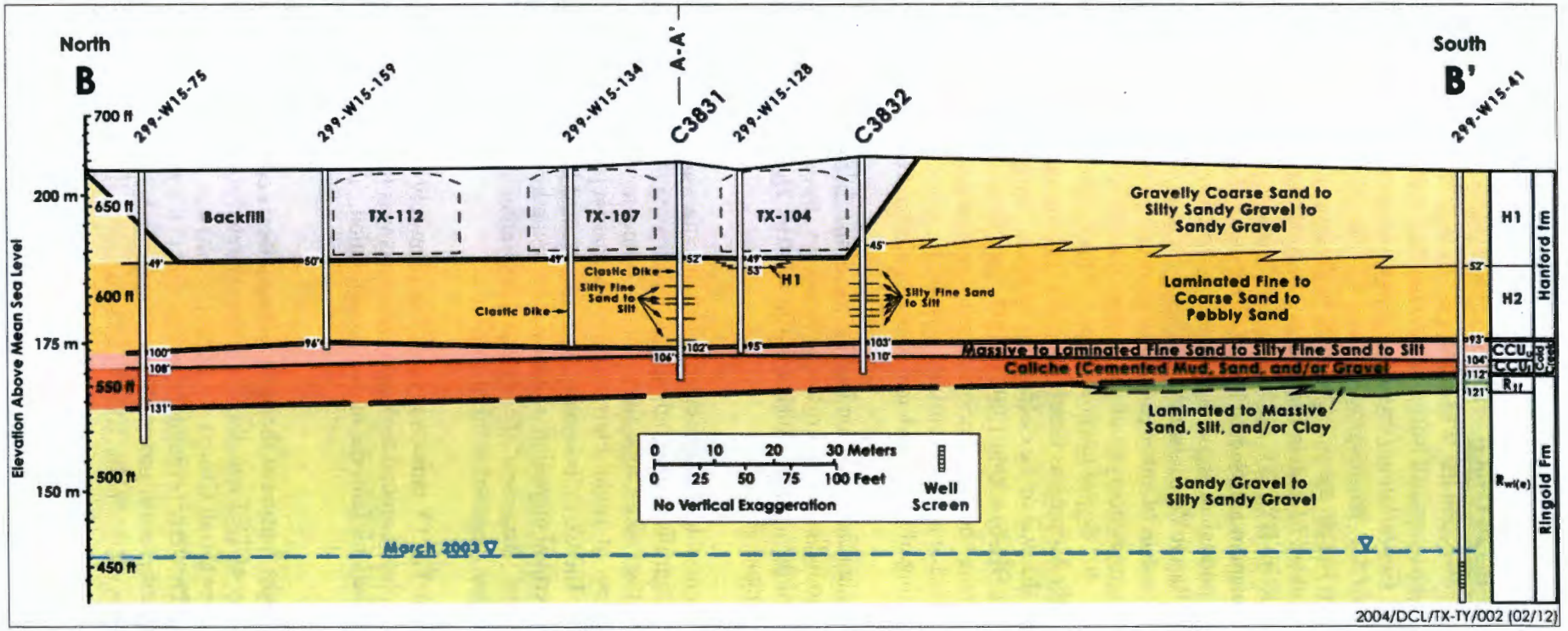


Figure A-2. North-South Hydrogeologic Cross Section B-B' across the 241-TX Tank Farm.



- **Columbia River Basalt Group**. The Columbia River Basalt Group forms the bedrock base of the aquifer beneath the WMA TX-TY. At least 50 basalt flows exist beneath the Hanford Site with a combined thickness of more than 3,000 m (10,000 ft) (DOE/RW-0164, *Consultation Draft Site Characterization Plan Reference Repository Location, Hanford Site, Washington*, Volume 1). The Elephant Mountain Member of the Saddle Mountains Basalt, the youngest flow in the area, lies ~150 m (500 ft) below land surface. The Elephant Mountain Member is ~80 to 90 ft (25 to 27 m) thick in the 200 West Area (RHO-BWI-ST-14, *Subsurface Geology of the Cold Creek Syncline*, "Chapter 3 – Wanapum and Saddle Mountains Basalts of the Cold Creek Syncline Area") and dated by the potassium/argon method to be 10.5 Ma ("Duration and Volume of Columbia River Basalt Volcanism: Washington, Oregon, Idaho" [McKee et al. 1977]). The Elephant Mountain Member consists of medium- to fine-grained tholeiitic basalt with abundant microphenocrysts of plagioclase (DOE/RW-0164). The top of basalt dips gently southwest ~0.7 degree toward the axis of the Cold Creek syncline. In general, lava flows of the Saddle Mountains Basalt and the overlying suprabasalt sediments thicken to the south toward the axis of the Cold Creek syncline. Only one borehole (299-W11-26, also referred to as DH-6) within 1,000 ft (300 m) of these WMAs extends to the basalt bedrock. Sandwiched between various basalt flows are sedimentary interbeds, collectively referred to as the Ellensburg Formation, which include fluvial and lacustrine sediments consisting of mud, sand, and gravel deposited between volcanic eruptions.

Little evidence exists of significant erosion into the top of the Elephant Mountain member within the 200 West Area and no indication of erosional "windows" through the basalt into the underlying Rattlesnake Ridge interbed (WHC-SD-EN-TI-014, *Hydrogeologic Model for the 200 West Groundwater Aggregate Area*).

Given the nature and extent of tank waste contamination in the vadose zone underlying WMA TX-TY, the most significant geologic features that have influenced contaminant migration and distribution through the vadose zone are the highly-cemented CCU_l layer (and perhaps the underlying silt-rich member of Taylor Flats, Ringold Formation [R_{tf}]) and the slight dip of all layers toward the south. The CCU_l, because of its thickness and low permeability, appears to have largely prevented vertical migration of tank waste contaminants below the subunit and enhanced lateral migration. Because of the general stratigraphic dip to the south, a greater portion of the inventory has migrated in this direction.

The excavation for WMA TX-TY tanks was constructed entirely in the Hanford formation sediments. The backfill placed around the completed tanks was the excavated materials that were stockpiled next to the tank farm during tank construction. The base of the excavation is ~48 ft (14.6 m) bgs.

At WMA TX-TY, the upper portion of the uppermost aquifer is contained in the Ringold Formation. In the vicinity of TX Farm, the top of the saturated zone is 235 ft bgs and the base (top of the Columbia River Basalt Group) is ~495 ft (151 m) bgs. The direction of current groundwater flow is southeasterly (eventually turning east to the river) in the southern portion of the 200 West Area, while it is north and northeast (through Gable Gap) in the northern portion of the 200 West Area. However, at WMA TX-TY, DOE/RL-2011-118, *Hanford Site Groundwater*

Monitoring Report for 2011 reports that the groundwater flow direction and rate at WMA TX-TY is influenced by the 200-ZP-1 pump-and-treat system.

Vadose zone conditions across the Hanford Site show variations similar to those observed in the uppermost aquifer system. Sediments in the vadose zone vary from open-framework gravels of the gravel-dominated facies and interbedded sand and silt of the silt-dominated facies of the Hanford formation to calcium carbonate-rich deposits of the Cold Creek unit and cemented gravels of the Ringold Formation. These sediments are characterized by numerous lateral discontinuities, such as pinchouts, erosion truncations, and irregular flow patterns. If clastic dikes are present, they may enhance vertical flow patterns. Therefore, there are numerous possible avenues for contamination to migrate through the vadose zone (HNF-4936, *Subsurface Physical Conditions Description of the S-SX Waste Management Area*).

APPENDIX B

LEAK ASSESSMENT SUPPORT INFORMATION

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APPENDIX B

LEAK ASSESSMENT SUPPORT INFORMATION

Table B-1 identifies documented known or suspected UPRs in TX Farm. The date the release was detected, the waste type and the volume of waste that leaked to the soil (if known) are listed. Of the UPRs of waste within TX Farm, only UPR-W-200-100 lost a significant volume of waste (2,500 gal).

Table B-2 shows waste types remaining in the TX Farm tanks.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
1-1951	Pipeline leak 241-TX Tank Farm Diversion box 241-TX-154	In the T Plant, the metal waste line from 154-TX diversion box to the 241-TX tank farm failed necessitating jumper changes in the 153-TX and 154-TX diversion boxes. It is believed the old line was plugged.	HW-20249, page 4	**See RPP-25113; possibly line V392. Not a listed as a UPR.**
Spring 1951	South of 242-T Evaporator	While jetting waste concentrate from the evaporator in the spring of 1951, a few gallons of waste was forced up and out of an open (above ground) riser. A maximum dose rate of 2 rad per hour at a distance of 5 centimeters (2 inches) was observed. A portion of the contamination was removed and the remainder covered with a foot of clean soil.	HW-60807	UPR-200-W-12 A similar incident occurred September 1955 on the west side of 242-T.
9-1951	Packing gland failure Tank 241-TX-117	In the T facility, packing gland failure of the 20 gpm pump at 117-TX tank caused ground contamination with first cycle supernatant up to 500-mrep/hr. Immediate action prevented any spread of contamination. Removal of contaminated soil is in progress.	HW-22284, page 3	Part of Consolidated UPR 200-W-94. Not listed as a separate event.
2-1952	Pipeline leak – overground line Waste discharge to ground Tanks 241-TX-117 and 241-TX-118	Rupture of an above-ground waste supernate line between 117 TX and 118 TX resulted in covering a ground area of approximately 20 feet by 120 feet with fluid. Prompt action was taken to prevent further spread. Hot tar was applied to fix the contamination and it is planned to place a rail fence around the area, which is inside a Radiation Danger Zone, to prohibit traffic over the contaminated ground.	HW-23679, page 4	Part of Consolidated UPR 200-W-94. Not listed as a separate event.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
3-1952	Pipeline leak – overground line Waste discharge to ground Tanks 241-TX-117 and 241-TX-118	A leak in the above-ground waste line between 117 TX and 118 TX resulted in an **estimated 1,000 or less gallons** of first cycle waste supernate contaminating approximately 2500 square feet of ground. It was agreed by all concerned the most effective remedy was to immediately fix this contamination with earth and road oil and erect a rail fence to prevent traffic over this area, which is within a Radiation Danger Zone. After this action was taken, a maximum dose rate of 130-mr/hr was detected at the covered ground surface.	HW-23992, page 4	This is the same event as reported in HW-23679, page 4. See also HW-23801. Part of Consolidated UPR 200-W-94. Not listed as a separate event.
9-12-1952	Pump removal leak Waste discharge to ground TX-106	Contamination spread during the removal of a temporary process waste pump from the 241-TX-106 Tank. Waste was being transferred from 241-TX-106 to 241-TX-114 via an overground line. The contamination on a pump seal was not sufficiently removed or packaged prior to moving the assembly, affecting the ground, personnel, and vehicles at the job site. Adverse wind conditions developed before the contamination could be totally removed or fixed, which caused the contamination spread to enlarge. Road oil (emulsified asphalt) was applied to the tank farm surface soil south of the 241-TX-106 tank the day after the release occurred because it became apparent that wind conditions had worsened and could have increased the spread of contamination.	09/15/52 Manufacturing Department Radiation Hazards Incident Investigation, HW-25688.	UPR-200-W-17
11-1952	Plugged cascade line Tanks 241-TX-105 and 241-TX-106	At 241-TX tank farm, a plug in the cascade line between 105TX and 106TX metal waste storage tanks was encountered. After nearly a week's effort the plug was removed by a remote method which required extreme ingenuity on both its development and use.	HW-26376, page Ed-7	Possible overflows
2-1953	Plugged cascade line Tanks 241-TX-105 and 241-TX-106	The UR periscope was moved to the 106-TX tank to assist in unplugging the cascade line from 105 to 106 TX.	HW-36979-A, page 90	Possible overflows

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
3-7-1954	Plugged pipeline Diversion box 241-TX-153 Waste discharge to ground	An underground waste line leading from 153-TX diversion box to 108-T waste tank via 152 and 153-T diversion boxes was plugged with concentrated TBP waste. Steam at "100 psi" applied through 153-TX box was ineffective in dissolving the plug. Consequently, (day) supervision instructed that "225 psi" steam be applied to the line. Appropriate connection was made to a riser between 108-T tank and 153-T box, that being the end of the plugged line nearest to a high-pressure main. The 4-12 shift duty supervisor inadvertently applied the 225 psi steam to the line while 100 psi steam was still being applied to the other end. The plug soon gave way and the material was forced from the line, through 153-TX box, into the temporary supply line, and beyond into the 100 psi service main. As a result, approximately 400 feet of steam line was contaminated, of which about half lay outside of the tank farm radiation zone (fence). The vent was discovered within an estimated fifteen minutes, by a process operator who made a routine approach to 153-TX box under assignment to bleed the line through remote valving within the box and thus determine when the line became freed. Survey and delineation of the contamination spread followed promptly. Survey disclosed leakage from the temporary steam line feeding 153-TX box showing activities up to 20 rads/hr in level, contamination on the ground under the first main line steam trap showing 2.5 rads/hr, and lesser amounts down that line (in the direction of other demand) toward 241-TXR.	HW-31138	Part of Consolidated UPR 200-W-94. Not listed as a separate event.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
4-1954	Tanks 241-B-105, 241-B-106, 241-TX-118, and 241-U-108 pumps	Packing failures on the liquid-seal deep well pumps continued to cause contamination spreads at 105-B, 106-B, and 118-TX. A maximum dose rate of 16-rads/hr including 2-r/hr at one foot was measured at the 106-B pump. A general decontamination program was progressing in these areas. The program for replacing liquid-seal pumps with mechanically-sealed pumps was started and was completed at 106-B tank. The 118-TX, 108-U and 105-B pumps were also removed and buried. Exposure rates up to 5-rads/hr including 300-mr/hr at one foot at 105-B were experienced during the removals. Contamination to 12-rads/hr at two inches at the 105-B riser, 5-rads/hr two feet from the riser and 200-mrem/hr outside the roped area were found. The contamination was covered and cleaned to the general background.	HW-31742, page 5 HW-32044, page 7	These pumps were not installed inside secondary containment pits. Contamination is associated with general contamination identified in tank farms. Part of Consolidated UPR 200-W-94. Not listed as a separate event.
4-30-1954 to 5-7-1954	Waste discharge to ground Tank 241-TX-118	241-TXR A leak in a line to tank 118-TX allowed some TBP waste to leak into the ground. Radiation readings of 2 Rads/hr at one feet were obtained.	HW-37301, page 110	Part of Consolidated UPR 200-W-94. Not listed as a separate event
5-1954	Tank 241-TX-118	Further contamination was spread to the ground at the 118-TX area. Failure to apply lock and tag procedure permitted the discharge of approximately **200 gallons** of TBP waste from the open discharge line from the main pump at 118-TX. Excavation of the area was started immediately at exposure rates up to 3.5-r/hr. Backfilling of the area reduced the general field to 300-mr/hr. No contamination spread beyond the 118-TX enclosed area was detected. The entire 118-TX area was scheduled to be excavated, sealed, and backfilled, now that the main pump has been replaced with a Fairbanks-Morse mechanically sealed pump.	HW-32044, page 6	See April 1954; HW-31742, page 5. Part of Consolidated UPR 200-W-94. Not listed as a separate event.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
5-3-1954	Tanks 241-TX-112, 241-TX-114, 241-TX-115, and 241-TX-117	Leaks at joints and flanges of overground lines continued to be a source of ground contamination. On 5-3-54, leaks were detected on both the 117-TX to 112-TX and the 114-TX to 115-TX overground lines. Ground contamination up to 23-rads/hr at 2 inches was detected at 114-TX. The ground and pipe contamination was cleared and all pipe joints rewrapped with plastic. On 5-12-54, a leak occurred at the 115-TX flange because of a gasket failure. The riser was contaminated to 11-rads/hr including 150-mr/gr at 6 inches. Cleaning reduced the contamination to 20-rads/hr and the riser was covered with plastic and roped off.	HW-32044, page 7	The indicated radiation dose rate at an unspecified riser on tank 115-TX is reported higher (20-rads/hr) after cleaning, which seems to be in error. Part of Consolidated UPR 200-W-94. Not listed as a separate event.
Fall 1954	French drain East side of TX Farm	This French drain was contaminated in the fall of 1954 to a maximum observed dose rate of 50 mrads/hr by a blowout of steam going through the tank farm process lines.	HW-60807	Sketch G in HW-60807 shows drain East of TX Farm near fence.
11-1954	Transfer line leak between tanks 241-TX-105 and 241-TX-118	First cycle waste was discovered leaking from a waste transfer line in November 1954. Coordinates included in ARH-2757 place the release adjacent to the east side of tank 241-TX-105, inside the tank farm fence. The maximum dose rate was 4.5 rad per hour at a distance of 1.2 meters (4 feet). The liquid release covered an area of approximately 30 by 38 meters (100 by 125 feet). The waste contained approximately 10 curies of fission products. The contaminated area was surrounded with a chain and radiation zone signs and was covered with clean soil in 1954.	HW-60807 (issued in 1959) and ARH-2757 (issued in 1973)	UPR-200-W-100

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
11-1954	Pipeline leak T-105 to TX-118	The incident involved failure of an unencased underground process line transporting first cycle waste supernatant with subsequent cave-in and gross ground contamination near the corner of 23rd and Camden Streets. An area about 75 x 100 feet was affected, with dose rates up to 11.5-rads/hr at two inches including 3.5-r/hr being measured over the liquid. This line had been out of service for almost eight months, but had not been pressure-tested before use. The process waste leakage was hosed down to prevent wind borne contamination spread and the leak area was backfilled shortly after the leak was discovered. In 1978, contaminated soil adjacent to the zone was removed on the south side to a depth of 4 ft and on the west side to a depth of 3 ft. The entire zone area was excavated to depth of 1 ft, the new surface was then treated with a heavy coating of fiberfilm to seal against moisture penetration. It was covered with 4 in. of sand and was treated with ureabore herbicide. All surfaces were covered with 4 in. of crushed rock to stabilize against wind dispersal. The area was backfilled with earth and later covered with gravel.	HW-34001, page 7 HW-33979, p. 2	HW-33979, page 2 describes transfer of **first cycle waste from tank T-105 to tank TX-118 being the source of this leak.** The waste leak was estimated as 3,450 gallons based on inventory readings at tanks 105-T and 118-TX. The 302-B catch tank was reported to retain 3,300 gallons of the leaked waste and rain water intrusion. **The estimated volume of waste discharged to the ground was less than 1,000 gallons.** UPR-200-W-29
12-1954	Acid leak Diversion box 241-TX-155 and 241-TX-153 catch tanks	An acid leak in the 155-TX diversion box nearly filled the catch tank, necessitating neutralization in the 153-TX diversion box catch tank. Considerable difficulty was encountered in accomplishing this, including failure of the above-ground circulation line. The resulting contamination of 50 square feet of cover blocks and ground, with dose rates up to 22-rads/hr at one foot, was only partially removed at month's end.	HW-34295, page 7	Catch tanks associated with diversion boxes 153-TX and 155-TX are constructed from carbon steel, which experiences excessive corrosion rate when exposed to nitric acid.
5-13-1955	Plugged pipeline 241-TXR	Continued to water sluice tank 105-TX, except for interruptions to replace #1 fan (blades gone) and to unplug 151-TXR to 105-TX line.	HW-36979-C, page 36	Possible overflow

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
8-1955	Plugged cascade line Tanks 241-TX-107 to 241-TX-108	On 8-10-55, the metal waste solution failed to cascade normally from the 107-TX to the 108-TX metal waste storage tanks. Since a restriction existed in the cascade line it was necessary to transfer the supernate in the 107-TX to the 108-TX storage tank via metal recovery vaults and pump pits. During the transfer the 108-TX storage tank was filled to the maximum operating level. The 107-TX storage tank is currently in the process of being refilled.	HAN-62372-DEL, August 1955 page 16	Possible overflow
10-1958	Plugged line Pipeline leak 241-SX and 241-TX Tank Farm	Of the two available lines for pumping non-boiling waste from the 241-SX to the 241-TX tank farm, one was found to be plugged, the other to have a leak. This situation made necessary an alternative program consisting of pumping the waste to the 101, 102, and 103 tanks in the 241-U farm. The pump out of the 111-SX tank will make this tank available for raw salt waste from the 202-S Building.	HW-58051, page D-3	**Identified in RPP-25113 as a failed line.**
12-12-1965	Pump line leak TX-118	Leak in spur line from the 118-TX pump caused ground contamination to a max of 5 rads/hr at two inches. Area excavated and backfilled reducing the dose rate to 30 mR/hr at the surface of the ground.	Radiation Occurrence Reports	
7-25-1966	Riser and pump leak Tanks 241-TX-116 and 241-TX-117	On Monday, July 25, the riser through which the 116-TX transfer line passes, plugged. Salt and pump pressure caused solution to leak around the riser flange on the 117-TX tank and from the pump seal at the 116-TX tank. Liquid ran a max of 10 feet from each tank riser and covered a total ground area of about 30 sq ft. Dose rates at a distance of 2 feet measured 3 R/hr. Clean-up consisted of washing the risers with water **and burying the contaminated dirt to a depth of 3 feet in holes dug near the risers**.	ISO-75 RD, page 117	This event is also discussed in ISO-428, page C-2.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
9-21-1966	Airborne contamination 241-TX-153 Diversion Box and Camden Avenue	Two plumes of airborne contamination from the 241-TX-153 Diversion Box floated northeast and southeast. The releases contaminated the ground and road on both sides of Camden Avenue. The total length of contamination was identified to be 228 meters (750 feet) north and south along Camden Ave. The contamination extended a maximum of 91 meters (300 feet) east of Camden Ave. The maximum contamination found was 700 millirem per hour. In 1966, the road contamination was covered with a new tar mat and the sides of the road were fixed with tar. The area on the west side of Camden Avenue, adjacent to the tank farm fence, was covered with gravel, In 1976, a road grader was used on the soil east of Camden Ave. to push the contamination into windrows. Test plots in this area revealed a thin layer of strontium-90 particles present. The area east of Camden Ave. was surface stabilized in 1990 with clean backfill and grass. This area is surrounded with Underground Radioactive Material signs	1995 T-Plant Aggregate Area Management Study Technical Baseline Report, BHI-00177 Handbook 200 Area Waste Sites, RHO-CD-673	UPR-200-W-99
4-4-1967	TX-117 pump leak	Rupture of top seal of 117-TX pump spread contamination over 16 sq ft of ground to 5 rads/hr WO and 2 R/hr WC at contact.	Radiation Occurrence Report	Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
4-11-1967	Waste discharge to ground Pipeline leak Tank 241-TX-118	242-T: The 118-TX pump line to the evaporator feed tank started leaking at the underground valve and overflowed the valve riser into the 118-TX pump pit excavation. Minor Construction dug a new pit and **installed a new line** that by-passed the contaminated area. The release covered 18 sq feet of ground to north of the valve riser. Several more gallons went into the hole dug for valve pit installation. Dose rates at the edge of the hole were 2 R/hr.	ISO-651 RD, page 74	This event is also reported in ISO-710, page D-1, 1967, Chemical Processing Department Monthly Report for April 1967, ISOCHEM Inc., Richland Washington Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.
9-6-1967	TX-117 pump leak	Pump at 117-TX leaked spilling about 10 gallons at base of pump. Dose rates from spill were 2 R/hr at 4 feet over an area of about 25 sq ft of ground. 2 or 3 more gallons spilled about 16 hours later. Dose rates were 1.5 R/hr at 2 inches. Covered with plastic and sand until disposal in burial trench.	Radiation Occurrence Report	Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.
3-10-1968	Plugged line Tank 241-TX-118 to 242-T Evaporator	242-T Started up on hot feed at 1000 on 3/8/68 but shut down at 1930 due to plug in line from 118-TX feed tank. Line unplugged and restarted at 1000 on 3/10/68. Shut down at 1820 on 3/10/68 when leaks developed in preheater lid gasket. Cell flushed down and holding. Operator found unusually high radiation readings and called HP. 4 Areas of contamination in vicinity of 117-TX Pump, ranging from 3 to 30 sq ft and 10 to 25 rad/hr. Contaminated soil moved to burial grounds.	ARH-258, page 115 Radiation Occurrence Report	Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.
3-31-1968	Tank 241-TX-117 pump	Leak developed at 117-TX pump on 3/30/68, while pumping waste supernate to 118-TX evaporator feed tank. Some ground contamination. Contaminated soil moved to burial grounds.	ARH-258, page 145	Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
5-27-1968	Tank 241-TX-118 pump	On 5/27 the 118-TX feed tank pump was found leaking at upper seal. New pump installed on 5/28.	ARH-458, page 91	Surface contamination part of Consolidated UPR 200-W-94. Not listed as a separate event.
7-28-1969	Plugged pipeline	242-T shut down on 7-25 due to vacuum loss while unplugging the 118TX feed line.	ARH-1023-3-DEL, page 30	Possible release
9-1968	Airborne Contamination From 153-TX	Ground and road contamination along Camden Avenue and adjacent ground surfaces resulted from two plumes of airborne contamination that floated northeast and southeast from 153-TX diversion box depositing ^{90}Sr over an area running 250-yards north and south along Camden and extending from 75 to 100-yards east of Camden. Particles up to 700 mrads/hr were found. Road contamination was covered with a new tar mat. The sides of the road were "fixed" with tar and the field to the East of Camden was turned under to cover the particulate material.	ARH-2757 pt. 4, p. 6	Part of Consolidated UPR 200-W-94. Not listed as a separate event.
10-6-1970	Plugged line Tanks 241-TY-103 and 241-TX-118	Tank 103TY: Transfer line to 118TX (242-T feed tank) plugged. Attempting to unplug with hot water. Line flushed with hot water.	ARH-1526-4, page 6 ARH-1526-4, page 8	**Possible release**
10-11-1970	Plugged cascade line Tanks 241-TX-111 and 241-TX-112	Bottoms waste routed to 114TX on 10-11-70 due to plugged line from 111TX to 112TX. Tank 111TX: Line to 112TX unplugged and 242-T bottoms routing switched batch to 110TX (110, 111, and 112TX series).	ARH-1526-4, page 14 ARH-1526-4, page 18	**Possible release**

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
10-28-1970	Line Release near TX-101	Pump to be removed from Tank 101-TX to 105-TX. Lines disconnected and valves removed. Ends of lines covered with rags. Liquid ran out of flush lines to dock, contaminating it to > 5 rad/hr. Nearest operator had coveralls contaminated to 3.5 rad/hr.	Radiation Occurrence Report	Contaminated areas in farm hosed down and contaminated dirt barreled for burial. Change procedure to include re-installing of valves. Part of Consolidated UPR 200-W-94. Not listed as a separate event.
11-20-1970	Plugged line Tank 241-TX-114	242T: Unit shut down on 11-19-70 because of plug in line from concentrator to 114TX bottoms tank. Restriction removed and restarted on 11-20-70.	ARH-1526-4, page 87	Possible overflow
12-29-1970	Plugged line Tanks 241-TY-103 and 241-TX-118	Tank 103TY: Unable to pump to 118TX (242-T feed tank). Line plugged. Unplugged line and resumed pumping.	ARH-1526-4, pages 146, 150	Possible overflow
1-7-1971	Personnel contamination 241-TX-113 Pump Pit	While leak testing a new jumper assembly, an employee closed a valve in a pump pit that caused a caustic solution to spray up through the pit cover. The employee's chin and left forearm were contaminated with radiation levels up to 30,000 counts per minute. The incident report and the Radiation Occurrence report both describe employee contamination but do not describe any ground or pump pit contamination.	1/7/71 Radiation Occurrence Report – 241-TX-113 Pump Pit.	UPR-200-W-129
5-8-1975	241-TX-153 Diversion Box transfer line leak Personnel contamination TX-101	While removing old gaskets on an over-ground transfer line from the 241-TX-153 Diversion Box to the 241-TX-101 Tank, a pipe fitter and an operator became contaminated. As the gaskets were being placed into a plastic bag, spotty contamination became airborne. Both employees had approximately 2000 counts per minute on their faces.	DOE/RL-91-61	UPR-200-W-126

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
4-25-1976	Raw water leak between TX-104 and TX-108	A hose bib failed and approximately 500 gal of water were released to the soil between tanks TX-104 and TX-108.	OR-76-61	Part of Consolidated UPR 200-W-94. Not listed as a separate event.
2-5-1977	Soil contamination near 102-TX	While pulling the pump at 102-TX contaminated liquid ran off the pump after it was placed on a truck, contaminating the ground to 800,000 dpm. Dirt was picked up and disposed of and the truck cleaned.	Radiation Occurrence Report	Part of Consolidated UPR 200-W-94. Not listed as a separate event.
1-10-1978	118-TX Valve Pit Release	At 118-TX Valve Pit a wash down and decontamination was necessary prior to entry. After applying a chemical decon agent and a neutralization agent, a water wash was attempted. After turning on two valves without success, the main valve was turned on and liquid shot from the nozzle, which was aimed away from the pit. After rusty water, a greenish yellow liquid came out reading 40 mrads/hr. The water was shut off and the area placed on mask. Adjacent to the pit an area about 50 feet long by 5 feet wide was reading to 300 mrad/hr, with spots up to 1500 mrad/hr. Determined that contamination was introduced into the raw water system at 118-TX Flush Pit. 12 barrels of soil and rock taken to burial ground. Line connection raw water system to process line at 118-TX removed and blanked off.	Radiation Occurrence Report	
12-20-90	Raw water leak at 244 TX	A water leak was dicovered in the 244-TX instrument building. Water lines froze and ruptured, and approximately 700 gallons of water drained into the 244-TX double contained receiver tank (DCRT).	EM-RL--WHC-TANKFARM-1990-0352	
12-23-90	Raw water leak at 244 TX	On 12/23/90 at 2100 hours the cover to the 244-TX DCRT raw water service pit was found open and valve #25 ruptured. Approximately 1750 gal of water drained to the 244-TX DCRT.	EM-RL--WHC-TANKFARM-1990-0376	

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**
8-30-1991	Raw water leak at 244 TX	A raw water valve was inadvertently left open causing a release of approximately 600 gal to the ground	RL--WHC-TANKFARM-1991-1037	
1-10-92	Raw water leak at 244 TX	Water was found flowing out of a hose connection on the West side of the 244-TX instrument building. Water was flowing at approximately 1 gal/min when discovered. The last known use of the system was 1/7/92, therefore it was estimated 3600 gallons of water had drained to the soil.	RL--WHC-TANKFARM-1992-0004	
5-20-2002	Personnel Contamination TX-116 water lance	Movement of a contaminated water lance in from TX-116 resulted in personnel and soil contamination. Approximately 2 liters of solution spilled from the water lance. The highest initial contamination measurement was 207 mrem/hr.	RP--CHG-TANKFARM-2002-0053	Part of Consolidated UPR 200-W-94. Not listed as a separate event.

References:
ARH-258-DEL, 1968, *Chemical Processing Division Daily Production Reports January, 1968 through March, 1968*, Atlantic Richfield Hanford Company, Richland, Washington.
ARH-458-DEL, 1968, *Chemical Processing Division Daily Production Reports April, 1968 through June, 1968*, Atlantic Richfield Hanford Company, Richland, Washington.
ARH-1023-DEL, 1969, *Chemical Processing Division Daily Production Reports January, 1969 through March, 1969*, Atlantic Richfield Hanford Company, Richland, Washington.
ARH-1526 4-DEL, 1970, *Chemical Processing Division Daily Production Reports October 1970 through December 1970*, Atlantic Richfield Hanford Company, Richland, Washington.
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BHI-00177, 1995, *T Plant Aggregate Area Management Study Technical Baseline Report*, Rev. 00, Bechtel Hanford, Inc., Richland, Washington.
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HW-22284, 1951, *Separations Section Radiation Monitoring Monthly Report September 1951*, General Electric Company, Richland, Washington.
HW-23679, 1952, *Separations Section Radiation Monitoring Monthly Report February, 1952*, General Electric Company, Richland, Washington.
HW-23801, 1952, *Radiological Sciences Department Investigation Radiation Incident, Class I, Number 194*, General Electric Company, Richland, Washington.
HW-23992, 1952, *Separations Section Radiation Monitoring Monthly Report March, 1952*, General Electric Company, Richland, Washington.
HW-25688, 1952, *Manufacturing Department – Radiation Hazards Incident Investigation Class I, No. 41*, General Electric Company, Richland, Washington.
HW-26376, 1952, *Hanford Works Monthly Report for November 1952*, General Electric Company, Richland, Washington.
HW-31138, 1954, *Radiological Sciences Department Investigation Radiation Incident, Class I, No. 349*, General Electric Company, Richland, Washington.

Table B-1. Unplanned Releases in or near 241-TX Tank Farm. (14 sheets)

241-TX Tank Farm Unplanned Releases				
Date	**Type of Event / Facility**	**Event as Described in Reference**	**Reference**	**Comments**

HW-31742, 1954, *Separations Section Radiation Monitoring Monthly Report April 1954*, General Electric Company, Richland, Washington.

HW-32044, 1954, *Separations Section Radiation Monitoring Monthly Report May 1954*, General Electric Company, Richland, Washington.

HW-33979, 1954, *Manufacturing Department Radiation Incident Investigation Incident Number: 393*, General Electric Company, Richland, Washington.

HW-34001, 1954, *Separations Section Radiation Monitoring Monthly Report November, 1954*, General Electric Company, Richland, Washington.

HW-34295, 1954, *Separations Section Radiation Monitoring Monthly Report December, 1954*, General Electric Company, Richland, Washington.

HW-36979 A, 1952, *Summary of Tank Farm Operation Start-Up to 0800 1-1-54*, General Electric Company, Richland, Washington.

HW-36979 C, 1955, *Summary of Tank Farm Operation From 0800 12-30-54 to 0800 5-27-55*, General Electric Company, Richland, Washington.

HW-37301, 1955, *Summary of Tank Farm Operations 1/1/54 to 5/27/55*, General Electric Company, Richland, Washington.

HW-58051-DEL, 1958, *Chemical Processing Department Monthly Report for October, 1958*, General Electric Company, Richland, Washington.

HW-60807, 1959, *Unconfined Underground Radioactive Waste and Contamination in the 200 Areas–1959*, General Electric Company, Richland, Washington.

ISO-75 RD, 1966, *Fission Products Process Engineering Monthly Reports January – December, 1966*, ISOCHEM Inc., Richland, Washington.

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EM-RL--WHC-TANKFARM-1990-0352, 1994, *Freezing of 244-TX Weight Factor and Specific Gravity Piping Results in Ruptured Subsequent Water Leakage*, Westinghouse Hanford Company, Richland, Washington.

EM-RL--WHC-TANKFARM-1990-0376, 1994, *Ruptured Valve at 244-TX Double Contained Receiver Tank (DCRT) Results in Water Leakage*, Westinghouse Hanford Company, Richland, Washington.

RL--WHC-TANKFARM-1991-1037, 1993, *Water Leak at 244-TX*, Westinghouse Hanford Company, Richland, Washington.

RL--WHC-TANKFARM-1992-0004, 1994, *Ball Valve Was Inadvertently Opened Which Released Approximately 3000 Gallons of Water to the Soil in a Radioactive Controlled Area*, Westinghouse Hanford Company, Richland, Washington.

RP--CHG-TANKFARM-2002-0053, 2002, *Movement of a Contaminated Water Lance at 241-TX Results in Personnel and Soil Contamination*, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-25113, 2006, *Residual Waste Inventories in the Plugged and Abandoned Pipelines at the Hanford Site*, Rev. 0-A, Meier Enterprises, Inc., Richland, Washington.

Table B-2. Remaining Waste in 241-TX Farm Tanks.[1] (2 sheets)

Tank	Waste Type	Volume (kgal)
241-TX-101	$BiPO_4$ metal waste (1950-1956) sludge	3
	REDOX high-level waste (1952-1958) sludge	70
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	13
241-TX-102	$BiPO_4$ metal waste (1950-1956) sludge	2
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	215
241-TX-103	Saltcake from the 242-T Evaporator campaign (1951-1955) saltcake	3
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	144
241-TX-104	REDOX high-level waste (1952-1958) sludge	34
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	33
241-TX-105	$BiPO_4$ metal waste (1950-1956) sludge	8
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	560
241-TX-106	$BiPO_4$ metal waste (1950-1956) sludge	1
	REDOX high-level waste (1952-1958) sludge	4
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	343
241-TX-107	REDOX high-level waste (1952-1958) saltcake	6
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	21
241-TX-108	$BiPO_4$ metal waste (1950-1956) sludge	2
	Tributyl phosphate process waste (1952-1958) sludge	4
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	121
241-TX-109	Plutonium Finishing Plant waste (1974-1988) sludge	5
	$BiPO_4$ first cycle decontamination waste and coating waste sludge	354
241-TX-110	$BiPO_4$ first cycle decontamination waste and coating waste sludge	37
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	430
241-TX-111	$BiPO_4$ first cycle decontamination waste and coating waste sludge	43
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	321
241-TX-112	Saltcake from the 242-T Evaporator campaign (1951-1955) saltcake	24
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	610
241-TX-113	$BiPO_4$ first cycle decontamination waste and coating waste sludge	93
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	545
241-TX-114	Saltcake from the 242-T Evaporator campaign (1951-1955) saltcake	58
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	469

Table B-2. Remaining Waste in 241-TX Farm Tanks.[1] (2 sheets)

Tank	Waste Type	Volume (kgal)
241-TX-115	Tributyl phosphate process waste (1952-1958) sludge	8
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	545
241-TX-116	Saltcake from the 242-T Evaporator campaign (1951-1955) saltcake	288
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	245
	Diatomaceous Earth	66
241-TX-117	Saltcake from the 242-T Evaporator campaign (1951-1955) saltcake	178
	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	419
	Diatomaceous Earth	29
241-TX-118	Saltcake from the 242-T Evaporator campaign (1955-1965) saltcake	214
	Saltcake + Plutonium Finishing Plant waste (1974-1988) plant sludge	33

[1] Best Basis Inventory estimates as of April, 2013 (see Appendix B and C), see RPP-19822, *Hanford Defined Waste Model – Revision 5.0* for waste type composition estimates.

$BiPO_4$ = bismuth phosphate REDOX = Reduction-Oxidation (S Plant)

All of the tanks in TX Farm have been interim stabilized and interim isolated. All raw water is cut off at the farm edge, and minimal air and electrical supplies remain.

Table B-3. Estimated Upper Range Waste Release Inventories in 241-TX Tank Farm.[1] (2 sheets)

Tank/UPR	Waste Release Volume, gal	^{60}Co, Ci	^{137}Cs, Ci	^{99}Tc, Ci	Basis
241-TX-104	25,000	0.05	2,500	1.1	Spare inlet overflow, cascade line release and/or tank leak. Volume and inventory estimate based on ^{238}U drywell visualizations, ^{238}U borehole sample results, and isotope concentrations in metal waste (RPP-19822). 0.03 Ci ^{238}U.
241-TX-105	125,000	0.23	12,500	5.4	The ^{238}U near tank 241-TX-105 appears to be from a transfer line or spare inlet release or may be a tank leak. Volume and inventory estimate based on ^{238}U drywell visualizations and isotope concentrations in metal waste (RPP-19822). 0.18 Ci ^{238}U.
241-TX-107	1,300	0.22	1,030	0.2	The ^{60}Co and ^{154}Eu activity near tank 241-TX-107 appears to be from a tank leak of SRR waste. Volume and inventory estimate based on ^{60}Co drywell visualizations and isotope concentrations for SRR waste (RPP-19822).

Table B-3. Estimated Upper Range Waste Release Inventories in 241-TX Tank Farm.[1] (2 sheets)

Tank/UPR	Waste Release Volume, gal	^{60}Co, Ci	^{137}Cs, Ci	^{99}Tc, Ci	Basis
241-TX-110					Releases near 241-TX-110 may be attributed to migration from 241-TX-114 or a tank leak. Release inventory estimates are included with 241-TX-114 estimates.
241-TX-113					Releases near 241-TX-113 attributed to 241-TX-114.
241-TX-114	7,000	0.009	6,000	0.09	The ^{137}Cs in drywell 51-14-04 appears to be from a tank leak of T1-SltCk EB waste. The size of the leak and inventory of waste released was based on drywell ^{137}Cs activity, 1974 241-TX-114 sample concentrations and isotope concentrations for T1-SltCk waste (RPP-19822).
241-TX-115					Neither drywells nor surface level measurements indicate a release from near this tank.
241-TX-116					Neither drywells nor surface level measurements indicate a release from near this tank.
241-TX-117					Except for near-surface UPRs, neither drywells nor surface level measurements indicate a release from near this tank.
241-TX-118	1,750	0.16	1,760	0.96	Volume and inventory estimates based on ^{137}Cs drywell visualizations and isotope concentrations for T2-SltCk waste (RPP-19822).
Surface Spills and Releases around tanks	Between 400 and 90,000	<0.04	~100	<0.05	Near surface (1-10 ft below ground surface) ^{137}Cs inventory estimated based on drywell measurements. Volume varies from ~400 gal for T2-SltCk or EB waste (the dominant waste in the tanks after 1975) to ~90,000 gal for 1C waste. Technetium and cobalt inventory estimates are similar for T1-SltCk, T2-SltCk, 1C, and R waste (the waste types most likely to be released).
Intentional Releases to Cribs and Trenches near 241-TX Tank Farm	~140 million	2.6	3,700	1.6	Inventories provided are mean values from RPP-26744 for cribs and trenches in 241-TX Tank Farm.

Table B-3. Estimated Upper Range Waste Release Inventories in 241-TX Tank Farm.[1] (2 sheets)

Tank/UPR	Waste Release Volume, gal	^{60}Co, Ci	^{137}Cs, Ci	^{99}Tc, Ci	Basis

[1] Cesium-137, ^{60}Co, and ^{99}Tc values are approximations decayed to January 1, 2001.

1C = bismuth phosphate first cycle decontamination waste and coating waste
EB = evaporator bottoms waste
R = Reduction-Oxidation (S Plant) high-level waste
SRR = sluiced Plutonium Uranium Extraction sludge from 241-A and 241-AX Tank Farms sent to B Plant to recover strontium
T1-SltCk = saltcake from 242-B Evaporator operation (1951-1953) and the 242-T Evaporator operation (1951-1955)
T2-SltCk = saltcake from the last 242-T Evaporator campaign (1965-1976)
UPR = unplanned release

References:
RPP-19822, *Hanford Defined Waste Model – Revision 5.0.*
RPP-26744, *Hanford Soil Inventory Model, Rev. 1.*

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APPENDIX C

INTERIM MEASURES INVESTIGATION SAMPLE DEPTH AND LOCATION MEETING NOTES

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MEETING NOTES

TX Tank Farm Probe Hole Location Selection Criteria

MEETING DATE: October 8, 2013

LOCATION: Washington State Department of Ecology, Richland Office

ATTENDEES:

Mike Barnes (Ecology)	Jeff Lyon (Ecology)
Mark Byrnes (CHPRC)	Julie Robertson (Freestone Environmental Services)
Joe Caggiano (Ecology)	Maria Skorska (Ecology)
Les Fort (WRPS)	Harold Sydnor (WRPS)
Dan Glaser (WRPS)	Cindy Tabor (WRPS)
R.D. Hildebrand (DOE)	Jacob Throolin (WRPS)
Art Lee (CHPRC)	Becky Wiegman (WRPS)

BACKGROUND: This meeting was part of the continuing effort to ensure timely communication between Ecology and DOE representatives regarding the field work being conducted pursuant to the *200 West Area Tank Farms Interim Measures Work Plan* (RPP-PLAN-53808, Revision 1) and *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* (RPP-PLAN-54376, Rev. 1). The purpose of the meeting was as follows:

- To identify the criteria to select the next four direct push locations in TX farm
- To potentially select a couple of the four locations.

DISCUSSION:

Purpose of the Direct Push Campaign: Ms. Tabor began the meeting with a review of the purpose of the overall TX farm direct push campaign. Per RPP-PLAN-53808, the goals of the current investigation are to determine the approximate boundary of the contaminated zone under TX Farm and the approximate depth of the mobile contaminants, to support a decision regarding the potential effectiveness of an interim surface barrier or other interim measure.

Description of the TX Direct Push Campaign: Ms. Tabor stated that the current campaign calls for the installation of 12 direct push boreholes for TX farm interim measure evaluation efforts. Eight locations are being pushed to outline the area of interest. Four additional locations will be pushed to further define vadose zone contamination.

Status of Current Field Work: Ms. Tabor stated that at six locations, probe holes have been pushed, logged, sampled, and decommissioned. Quick-turn result for Tc-99 and nitrate are available for these six locations. At an additional two locations, probe holes have been pushed and logged, and sampling of these locations is underway.

Available Information to Aid in Establishing Criteria for Direct Push Locations: Ms. Tabor provided a series of diagrams and figures illustrating the locations of the TX farm tanks, piping, dry wells, and characterization boreholes, as well as borehole logging data and results from prior field activities measuring soil resistivity. Mr. Fort provided information regarding the TX farm tank leak loss assessment efforts, noting that six TX farm tanks are recommended for additional assessment. The attendees discussed the characterization and leak

assessment information and agreed that it seems likely that releases have occurred from tanks 241-TX-104, 105, 107, and 114. Based on ORP and Nez Perce interpretations of available data, the attendees identified likely locations of contaminants in the soil column.

Establish Criteria: After reflecting on the purpose of the TX farm investigation, available characterization and tank leak loss information, various possible interim actions, and TX farm infrastructure, the attendees developed a list of criteria applicable to decisions regarding locating the four additional TX farm probe holes. The attendees agreed that the boreholes should be located to support the following goals:

- Testing of the beta probe
- Better defining areas contaminated by tank waste
- Assisting in the preliminary definition of the areal extent of an interim barrier, if deemed appropriate.

Additionally, the attendees agreed that probe hole siting should take into account the desirability of:

- Locations where there is prior indication of the presence of mobile contaminants
- Locations that are of interest to stakeholders (Nez Perce)
- Locations where infrastructure and surface contours would not inhibit placement of a hydraulic hammer unit or installation of a probe hole.

Mr. Hildebrand noted that if the parties agree that a borehole is needed outside the TX farm on property managed by RL, ORP would work with RL to support the effort.

Establish Areas to Evaluate: The meeting attendees agreed to conduct ground penetrating radar (GPR) surveys at four locations within the TX farm near tanks 241-TX-104, 105, 107, and 114. The attendees noted the following characteristics of these locations.

- Three of these four locations span small geographic areas where both ORP and Nez Perce data interpretations indicate subsurface contamination with cesium, uranium, or cobalt is likely.
- Two of the locations are likely to contain technetium at levels high enough to be useful for testing the beta probe.
- All are near tanks that are likely to have released contaminants to the soil column (241-TX-104, 105, 107, and 114).

The GPR survey results should identify where infrastructure is present to better locate investigation sites. An additional meeting will be set up to further discuss probe hole placement.

RP Douglas H Hildebrand		10-23-2013
DOE Project Manager (print)	DOE Project Manager (signature)	Date
Jeffery J Lyon		10/24/13
Ecology Project Manager (print)	Ecology Project Manager (signature)	Date

TX INTERIM MEASURE PLANNING – SOIL SAMPLE DEPTH MEETING MINUTES FISCAL YEAR 2013

This package contains summary notes from the following meetings:

- July 18, 2013, TX Sample Selection Meeting for Locations C8810, C8812, and C8814
- August 15, 2013, TX Sample Selection Meeting for Locations C8806 and C8808
- August 29, 2013, TX Sample Selection Meeting for Location C8802

R Douglas Hildebrand		10-3-2013
DOE Project Manager (print)	DOE Project Manager (signature)	Date
Jeffery J Lyon		10-3-13
Ecology Project Manager (print)	Ecology Project Manager (signature)	Date

MEETING NOTES

TX Sample Selection Meeting for Locations C8810, C8812, and C8814

MEETING DATE: July 18, 2013

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

Chris Kemp (DOE-ORP)	
Mike Barnes (Ecology)	
Maria Skorska (Ecology)	
Becky Wiegman (WRPS)	
Kent Reynolds (Energy Solutions)	
Harold Sydnor (WRPS)	
Cindy Tabor (WRPS)	
Les Fort (WRPS)	

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from WRPS, DOE, ORP, DOE Richland Operations Office (RL), and Ecology, to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at locations C8810, C8812, and C8814.

DISCUSSION: Cindy Tabor discussed the available data from the current TX Tank Farm field campaign and the additional information from the previous TX Tank Farm vadose zone field activities.

Sample depths were recommended where there were higher moisture peaks and finer grained material (based on Draft Gamma and Moisture Plots). Depths were also within the range of where previous vadose zone field activities showed detectable nitrate and technetium-99 concentrations (60 – 100 feet below ground surface [ft bgs]).

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8810	C8812	C8814
Sample Depths in ft bgs (Geologic Area[a])	60-62 (H2) 87-89 (H2) 102-104 (CCu)	54-56 (H2) 70-72 (H2) 103-105 (CCu)	56-58 (H2) 70-72 (H2) 92-94 (H2)

[a]H2 = Hanford formation unit 2 and CCu = Cold Creek unit

Two sample intervals in the H2 were selected from each of the three locations. At two of the locations (C8810 and C8812), an additional deeper interval in the CCu was selected for sampling. At C8814, and additional H2 interval from 92-94 ft bgs was selected for sampling, as this interval had the highest moisture peak in the H2 formation.

MEETING NOTES

TX Sample Selection Meeting for Locations C8806 and C8808

MEETING DATE: August 15, 2013

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

Maria Skorska (Ecology)	Harold Sydnor (WRPS)
Mike Barnes (Ecology)	Kent Reynolds (Energy Solutions)
Jeff Lyons (Ecology)	
Cindy Tabor (WRPS)	
Susan Eberlein (WRPS)	
Chris Kemp (DOE-ORP)	
Les Fort (WRPS)	

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from WRPS, DOE, ORP, DOE Richland Operations Office (RL), and Ecology, to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at locations C8806 and C8808.

DISCUSSION: Cindy Tabor provided a field status summary and discussed the available data from the current TX Tank Farm field campaign. Additionally, information from the previous TX Tank Farm vadose zone field activities was discussed.

Cindy Tabor identified that five locations had been pushed and logged to an approximate depth of 110 feet below ground surface (ft bgs). Two of these locations had to be pushed twice since refusal was met around 65 ft bgs. It was also identified that two locations had been sampled, results had been received from these locations, and that a third location was currently being sampled. Two rigs were working in the farm and work was expected to occur during the upcoming weekend.

Mike Barnes and Les Fort briefly discussed the uranium plume located at the south side of Tank TX-104. It was identified that everyone should be aware of this as sampling was to occur in this area. Mike Barnes also asked about real-time monitoring versus laboratory analysis.

The following is a summary of information from the current TX Tank Farm direct push effort that was provided:

Location (surface elevation ft amsl)		C8809/C8810 (672.8)		C8811/C8812 (676.5)		C8813/C8814 (671.5)
Sample Depth ft bgs (center depth ft amsl)		60-62 (611.8)		54-56 (620.5)		56-58 (614.5)
Nitrate µg/g	Tc-99 pCi/g	~10	ND	~11	ND	NA
Sample Depth ft bgs (center depth ft amsl)		87-89 (584.8)		70-72 (605.5)		70-72 (600.5)
Nitrate µg/g	Tc-99 pCi/g	~23	~1	~8	ND	NA
Sample Depth ft bgs (center depth ft amsl)		102-104 (569.8)		103-105 (572.5)		92-94 (578.5)
Nitrate µg/g	Tc-99 pCi/g	~4	~0.3	~152	~13	NA
Comment		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-3 Intervals in H2

Notes: Red #s = preliminary quick-turn analytical concentrations, NA = Not available. Final data will be released in a data package generated by the laboratory.
ft bgs = feet below ground surface, ft amsl = feet above mean sea level

Sample depths were recommended where there were higher moisture peaks and finer grained material (based on Draft Gamma and Moisture Plots). Depths were also within the range of where previous vadose zone field activities showed detectable nitrate and technetium-99 concentrations (60 – 100 ft bgs).

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8806	C8808
Sample Depths in ft bgs (Geologic Area[a])	56-58 (H2) 85-87 (H2) 101-103 (CCu)	53-55 (H2) 84-86 (H2) 105-107 (CCu)

[a]H2 = Hanford formation unit 2 and CCu = Cold Creek unit

Two sample intervals in the H2 and one deeper sample interval in the CCu were selected from Locations C8806 and C8808.

MEETING NOTES

TX Sample Selection Meeting for Location C8802

MEETING DATE: August 29, 2013

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

Mike Barnes (Ecology)	Les Fort (WRPS)
Joe Caggiano (Ecology)	Harold Sydnor (WRPS)
Jacob Throolin (WRPS)	Cindy Tabor (WRPS)
Kent Reynolds (Energy Solutions)	Becky Wiegman (WRPS)
R.D. Hildebrand (DOE)	

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from WRPS, DOE, ORP, DOE Richland Operations Office (RL), and Ecology, to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at location C8802.

DISCUSSION: Cindy Tabor provided a field status summary and discussed the available data from the current TX Tank Farm field campaign. Additionally, information from the previous TX Tank Farm vadose zone field activities was discussed.

Cindy Tabor identified that six locations had been pushed and logged to approximately a depth of 110 feet below ground surface (ft bgs). It was also identified that five locations had been sampled and that results had been received from three of these locations.

The following is a summary of information from the current TX Tank Farm direct push effort that was provided:

Location (surface elevation ft amsl)		C8805/C8806 (672.79)	C8807/C8808 (672.46)	C8809/C8810 (672.8)		C8811/C8812 (676.5)		C8813/C8814 (671.5)	
Sample Depth ft bgs (center depth ft amsl)		56-58 (615.79)	53-55 (618.46)	60-62 (611.8)		54-56 (620.5)		56-58* (614.5)	
Nitrate µg/g	Tc-99 pCi/g			~10	ND	~11	ND	~7	ND
Sample Depth ft bgs (center depth ft amsl)		85-87 (586.79)	84-86 (587.46)	87-89 (584.8)		70-72 (605.5)		70-72 (600.5)	
Nitrate µg/g	Tc-99 pCi/g			~23	~1	~8	ND	~5	ND
Sample Depth ft bgs (center depth ft amsl)		101-103 (570.79)	105-107 (566.46)	102-104 (569.8)		103-105 (572.5)		92-94 (578.5)	
Nitrate µg/g	Tc-99 pCi/g			~4	~0.3	~152	~13	~16	ND
Comment		-2 Intervals in H2 -1 Interval in Cold Creek Unit	-2 Intervals in H2 -1 Interval in Cold Creek Unit	-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-3 Intervals in H2	

Notes: Red #s = preliminary quick-turn analytical concentrations, NA = Not available. Final data will be released in a data package generated by the laboratory.
ft bgs = feet below ground surface, ft amsl = feet above mean sea level

Mike Barnes asked if there were thoughts on the reason for the higher technetium-99 and nitrate concentrations at Location C8812 (deeper interval of 103-105 ft bgs). A discussion followed that identified that the technetium in the Cold Creek unit could be from lateral and vertical migration of contaminants. It was noted that this information would be considered when developing the criteria for future direct push locations and sample depth selections.

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8802
Sample Depths in ft bgs (Geologic Area[a])	51-53 (H2) 59-61 (H2) 101-103 (CCu)

[a]H2 = Hanford formation unit 2 and CCu = Cold Creek unit

Two sample intervals in the H2 and one deeper sample interval in the CCu were selected from C8802. It was noted that the 59-61 ft bgs interval was not as deep as the sample interval from other locations (which were typically around 70 to 80 ft bgs); however, this interval exhibited the highest moisture peak in the H2. For this reason, it seemed reasonable to select this sample interval.

TX INTERIM MEASURE PLANNING SOIL SAMPLE DEPTHS FOR C8800 AND C8804 MEETING MINUTES

MEETING DATE: October 3, 2013

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

R.D Hildebrand (DOE-ORP)	Les Fort (WRPS)
Susan Eberlein (WRPS)	Penny Berlin (Energy Solutions)
Maria Skorska (Ecology)	
Joe Caggiano (Ecology)	
Kent Reynolds (Energy Solutions)	
Harold Sydnor (WRPS)	
Cindy Tabor (WRPS)	

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from WRPS, DOE, ORP, DOE Richland Operations Office (RL), and Ecology, to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at locations C8800 and C8804.

DISCUSSION: Cindy Tabor discussed the status of TX Tank Farm field campaign: 6 of the locations have been pushed, logged, sampled, and decommissioned along with deep electrode placement. Two additional locations have been pushed, logged, and are being discussed in this meeting. Data from the current TX Tank Farm field campaign and the additional information from the previous TX Tank Farm vadose zone field activities were also discussed.

The following is a summary of information from the current TX Tank Farm direct push effort that was provided:

Location (surface elevation ft amsl)		C8801/C8802 (672.49)		C8805/C8806 (672.79)		C8807/C8808 (672.46)		C8809/C8810 (672.8)		C8811/C8812 (676.5)		C8813/C8814 (671.5)	
Sample Depth ft bgs (center depth ft amsl)		51-53 (620.49)		56-58 (615.79)		53-55 (618.46)		60-62 (611.8)		54-56 (620.5)		56-58* (614.5)	
Nitrate µg/g	Tc-99 pCi/g	~9	ND	~12	~0.3	~9.5	ND	~10	ND	~11	ND	~7	ND
Sample Depth ft bgs (center depth ft amsl)		59-61 (612.49)		85-87 (586.79)		84-86 (587.46)		87-89 (584.8)		70-72 (605.5)		70-72 (600.5)	
Nitrate µg/g	Tc-99 pCi/g	~9	ND	~9	~0.3	~8	~0.3	~23	~1	~8	ND	~5	ND
Sample Depth ft bgs (center depth ft amsl)		101-103 (570.49)		101-103 (570.79)		105-107 (566.46)		102-104 (569.8)		103-105 (572.5)		92-94 (578.5)	
Nitrate µg/g	Tc-99 pCi/g	~46	ND	~25	ND	~14	~0.2	~4	~0.3	~152	~13	~16	ND
Comment		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-2 Intervals in H2 -1 Interval in Cold Creek Unit		-3 Intervals in H2	

Notes: Red #s = preliminary quick-turn analytical concentrations, NA = Not available. Final data will be released in a data package generated by the laboratory.
ft bgs = feet below ground surface, ft amsl = feet above mean sea level

Sample depths were recommended where there were higher moisture peaks and finer grained material (based on Draft Gamma and Moisture Plots). Depths were also within the range of where previous vadose zone field activities showed detectable nitrate and technetium-99 concentrations (60 – 100 feet below ground surface [ft bgs]).

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8800	C8804
Sample Depths in ft bgs (Geologic Area[a])	53.5-55.5 71.5-73.5 98-100	77-79 90-92 98-100

[a]H2 = Hanford formation unit 2 and CCu = Cold Creek unit

Two sample intervals in the H2 formation and one sample interval in the CCu were selected from each of the three locations.

R Douglas Hildebrand	R D Hildebrand	10-16-2013
DOE Project Manager (print)	DOE Project Manager (signature)	Date
Jeffery J Lyon	Jeffery J Lyon	11-04-13
Ecology Project Manager (print)	Ecology Project Manager (signature)	Date

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TX INTERIM MEASURE PLANNING – SOIL SAMPLE DEPTH
MEETING MINUTES
FISCAL YEAR 2014

This package contains summary notes from the following meetings:

- February 5, 2014, TX Sample Selection Meeting for Locations C8816 and C8818
- February 12, 2014, TX Sample Selection Meeting for Locations C8820 and C8822

Douglas Hildebrand	RD Hildebrand	2-26-2014
DOE Project Manager (print)	DOE Project Manager (signature)	Date
Jeffery J Lyon		2-26-14
Ecology Project Manager (print)	Ecology Project Manager (signature)	Date

Key Words - 241-TX Tank Farm

Milestone - M-045-21

TSD - S-24

MEETING NOTES

TX Sample Selection Meeting for Locations C8816 and C8818

MEETING DATE: February 5, 2014

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

Chris Kemp (DOE-ORP)	Joe Caggiano (Ecology)
Les Fort (WRPS)	Dan Parker (WRPS)
Maria Skorska (Ecology)	Cindy Tabor (WRPS)
Becky Wiegman (WRPS)	Harold Sydnor (WRPS)
Penny Berlin (Energy Solutions)	

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from Washington River Protection Solutions (WRPS), Department of Energy Office of River Protection (DOE-ORP), Department of Energy Richland Operations Office (DOE-RL), and Washington State Department of Ecology (Ecology), to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at locations C8816 and C8818.

DISCUSSION: Cindy Tabor discussed the available data from the current TX Tank Farm field campaign and the additional information from the previous TX Tank Farm vadose zone field activities.

Sample depths were recommended where there were higher moisture peaks and finer grained material (based on Draft Gamma and Moisture Plots). Depths were also within the range of where previous vadose zone field activities showed detectable nitrate and technetium-99 concentrations (60 – 100 feet below ground surface [ft bgs]). Note: A depth of 85-87 ft bgs was recommended; however, Joe Caggiano indicated that he preferred the interval of 67-69 ft bgs as there was a high gross count peak associated with this interval. This interval was selected over the 85-87 ft bgs interval.

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8816	C8818
Sample Depths in ft bgs (Geologic Area*)	68-70 (H2) 74.5-76.5 (H2) 105-107 (CCu)	59-61 (H2) 67-69 (H2) 103-105 (CCu)

*H2 = Hanford formation unit 2 and CCu = Cold Creek unit

Two sample intervals in the H2 and one deeper sample interval in the CCu were selected from Locations C8816 and C8818.

MEETING NOTES

TX Sample Selection Meeting for Locations C8820 and C8822

MEETING DATE: February 12, 2013

LOCATION: Washington River Protection Solutions, 2440 Stevens

ATTENDEES:

Joe Caggiano (Ecology)	Harold Sydnor (WRPS)
Mike Barnes (Ecology)	Becky Wiegman (WRPS)
Doug Hildebrand (DOE-ORP)	Les Fort (WRPS)
Cindy Tabor (WRPS)	Penny Berlin (Energy Solutions)

BACKGROUND: This meeting was part of the continuing effort to ensure communication between Ecology and DOE representatives regarding the field work associated with interim measures. Specifically RPP-PLAN-54376, *Sampling and Analysis Plan for Soil Samples in Support of Interim Measure Planning at the 241-TX Tank Farm* states that geophysical logging along with available quick turnaround analysis ("quick turn") of two mobile contaminants (^{99}Tc and nitrate) will be used to aid in determining sample depths" and that "after this information is obtained, meetings will be held with, or e-mails will be sent to, representatives from WRPS, DOE-ORP, DOE Richland Operations Office (DOE-RL), and Ecology, to gain a consensus on sample depths."

The purpose of this meeting was to discuss and reach agreement on the intervals to be sampled at locations C8820 and C8822.

DISCUSSION: Cindy Tabor provided a field status summary and discussed the available data from the current TX Tank Farm field campaign. Additionally, information from the previous TX Tank Farm vadose zone field activities was discussed.

Sample depths were recommended where there were higher moisture peaks and finer grained material (based on Draft Gamma and Moisture Plots). Depths were also selected in the areas where dry well logging showed higher cesium concentrations.

CONCLUSIONS: The following depths were unanimously agreed upon by the group participants:

Location	C8820	C8822
Sample Depths in ft bgs (Geologic Area[a])	53-55 (H2) 83-85 (H2) 100-102 (CCu)	50-52 (H2) 59-61 (H2) 101-103 (CCu) 107-109[b] (CCu)

[a]H2 = Hanford formation unit 2 and CCu = Cold Creek unit

[b]Joe Caggiano indicated that he was interested in sampling the deeper moisture peak interval; however, it was identified that this was at the bottom of the borehole and it may not be possible to achieve sample depth since refusal was met around this depth. It was agreed that an attempt would be made to collect a fourth sample interval at this location at 107-109 ft bgs.

Two sample intervals in the H2 and one deeper sample interval in the CCu were selected from Locations C8820 and C8822. As noted, an attempt will be made to collect an additional sample in the CCu at location C8822 at a depth of 107-109 ft bgs.

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APPENDIX D

INTERIM MEASURES INVESTIGATION DIRECT PUSH LOGGING RESULTS

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TX-Farm C8799 Header Information

Small Diameter –Moisture Survey

Probehole:	C8799	Log Date:	September 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136303.58	Elevation:	205.08 m
Easting:	566770.48		672.82 ft.

1 Repeat/Overlap Intervals

Gamma:	104-99; 50-44.5; 47-50
Moisture:	104.5-99.5; 16-11; 13-16
Temperature:	50-53

2 Observations

Gamma:

Cs-137 is observed in this borehole near surface. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

Moisture:

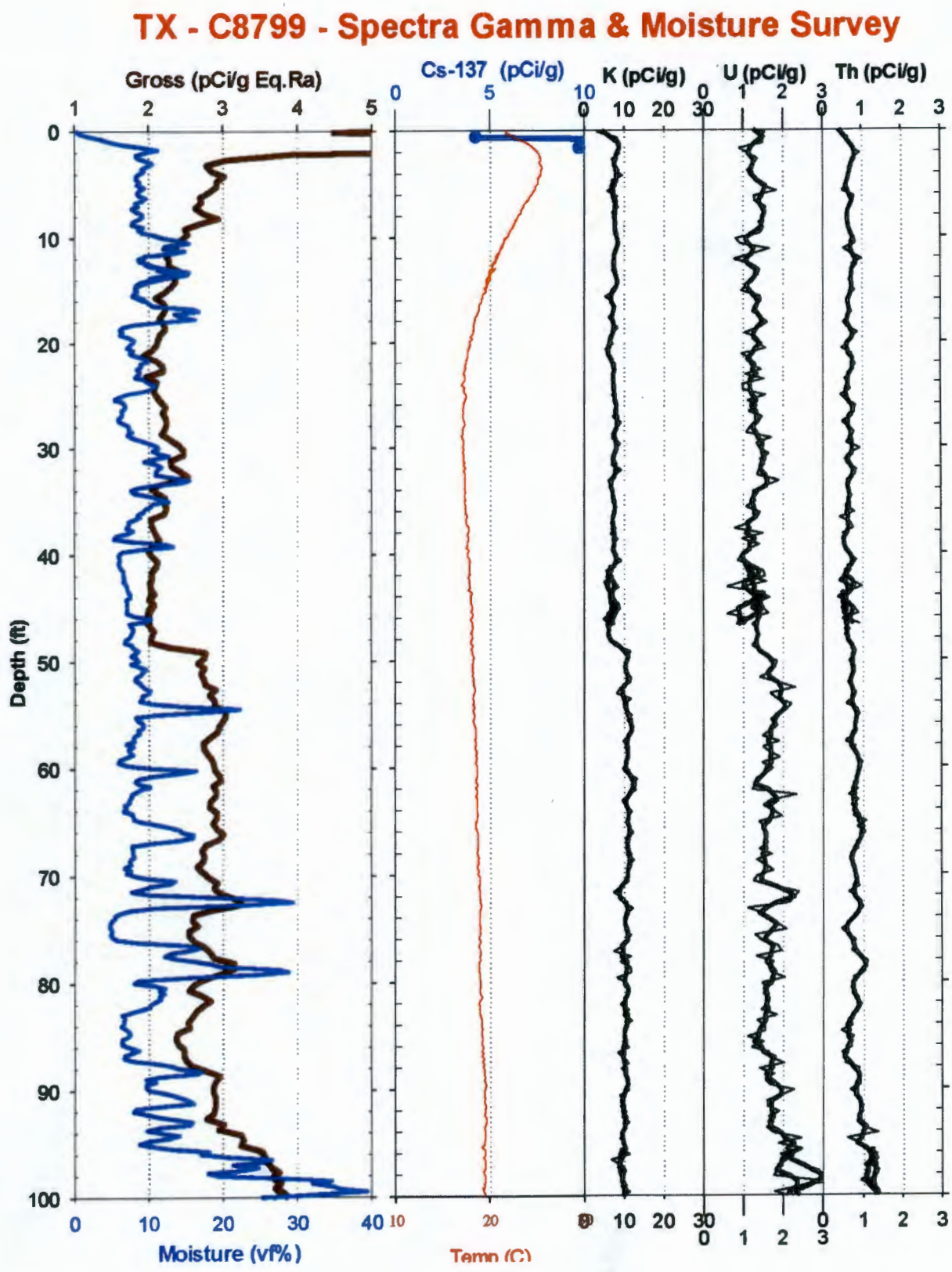
Moisture values range from 5-45%.

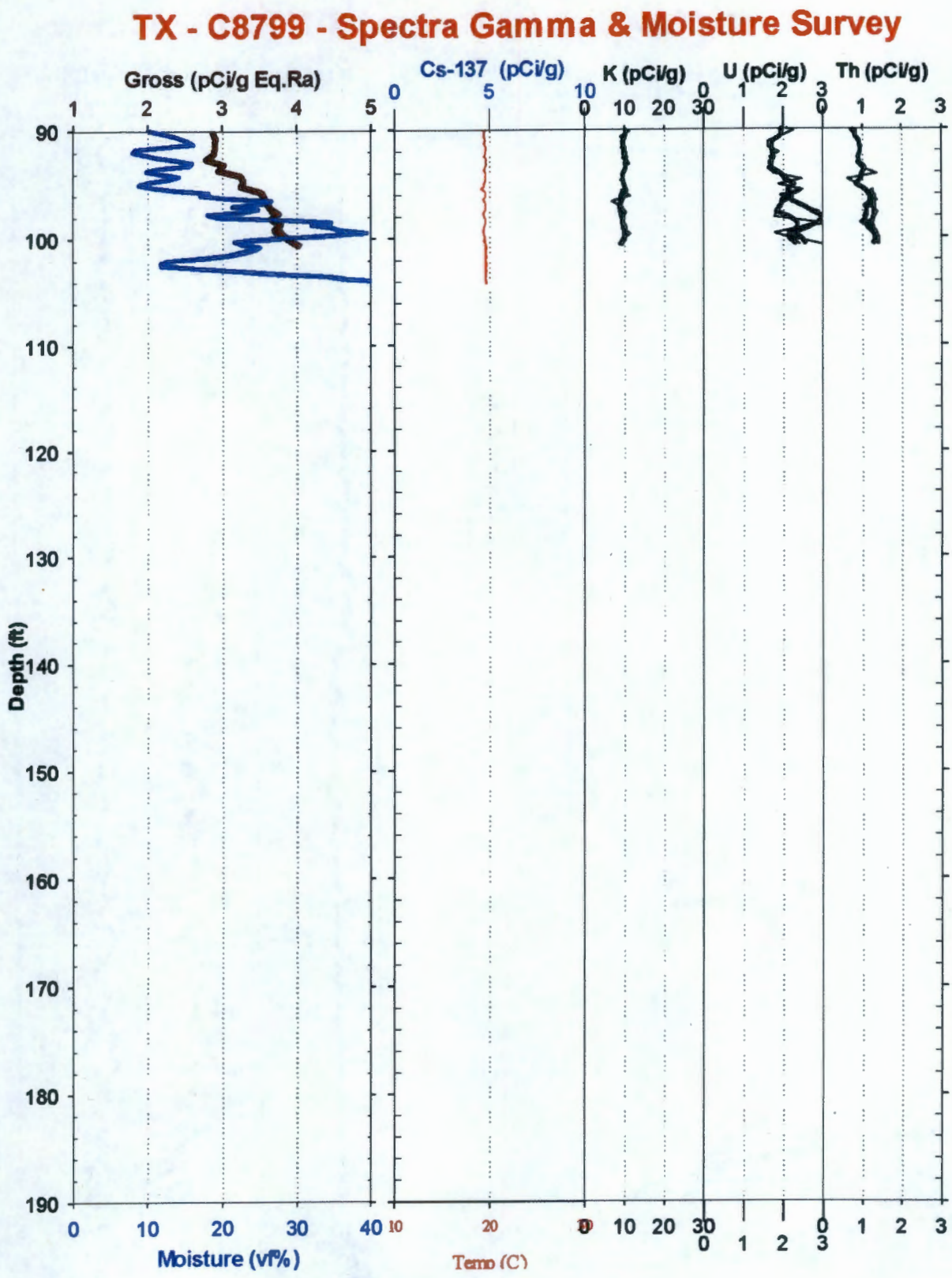
Temperature:

The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

3 Calibration Certificates

Moisture	
Date:	Sept 18, 2013
Electronic File:	Moist-2_2013-v1.zip
Gamma BGO	
Date:	Sept 18, 2013
Electronic File:	BGO-1_2013-v0.zip
LaBr	
Date:	Sep 18, 2013
Electronic File:	LaBr-1_2013-v1.zip


TX - C8799 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8799 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

TX-Farm C8801 Header Information

Small Diameter –Moisture Survey

Probehole:	C8801	Log Date:	August 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136259.119	Elevation:	204.98 m
Easting:	566717.748		672.49 ft.

Repeat/Overlap Intervals

Gamma:	104.5-99.5 34.5-29.5	Moisture:	108-103

Observations

Gamma:

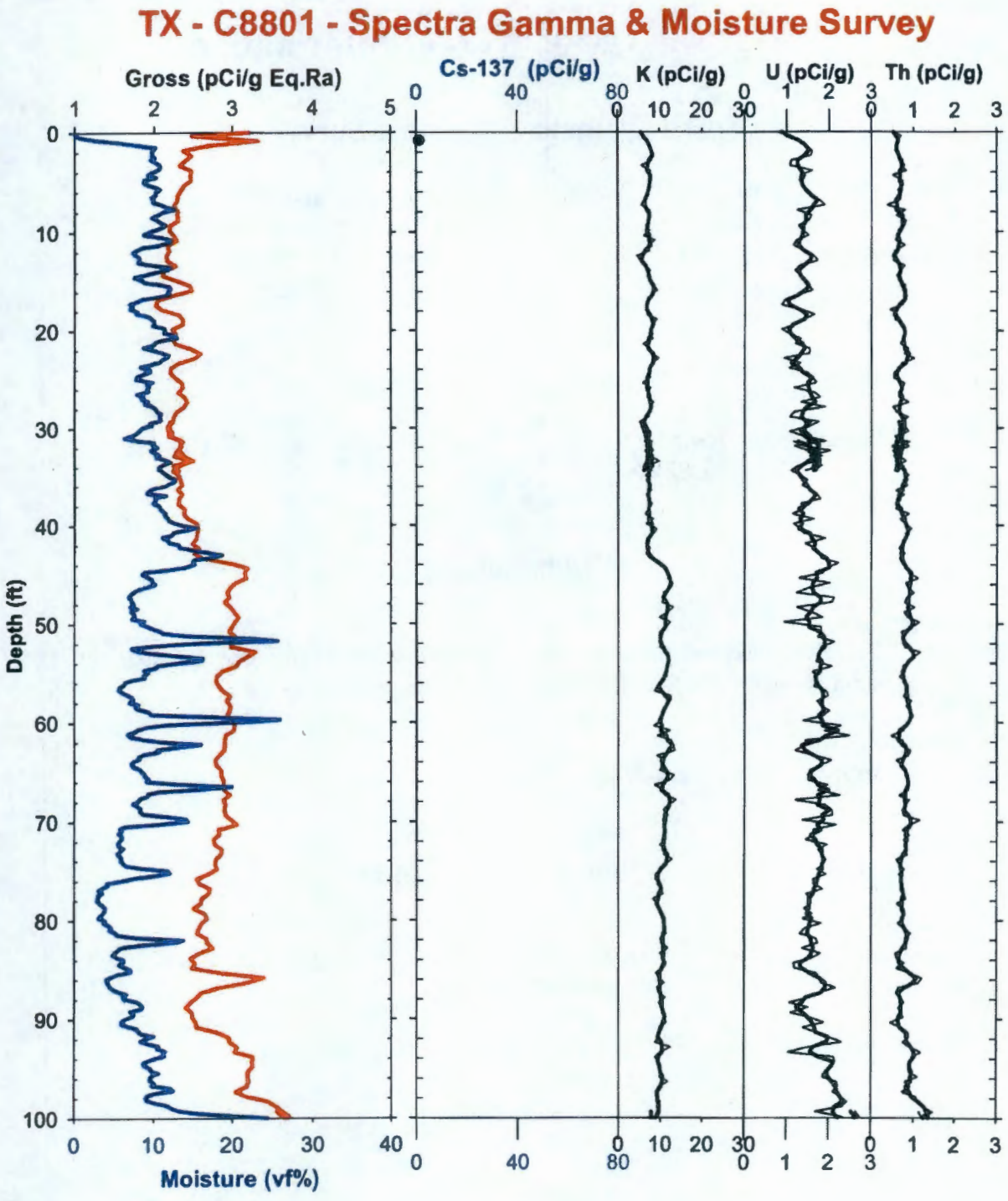
Cs-137 is observed in this borehole near surface. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

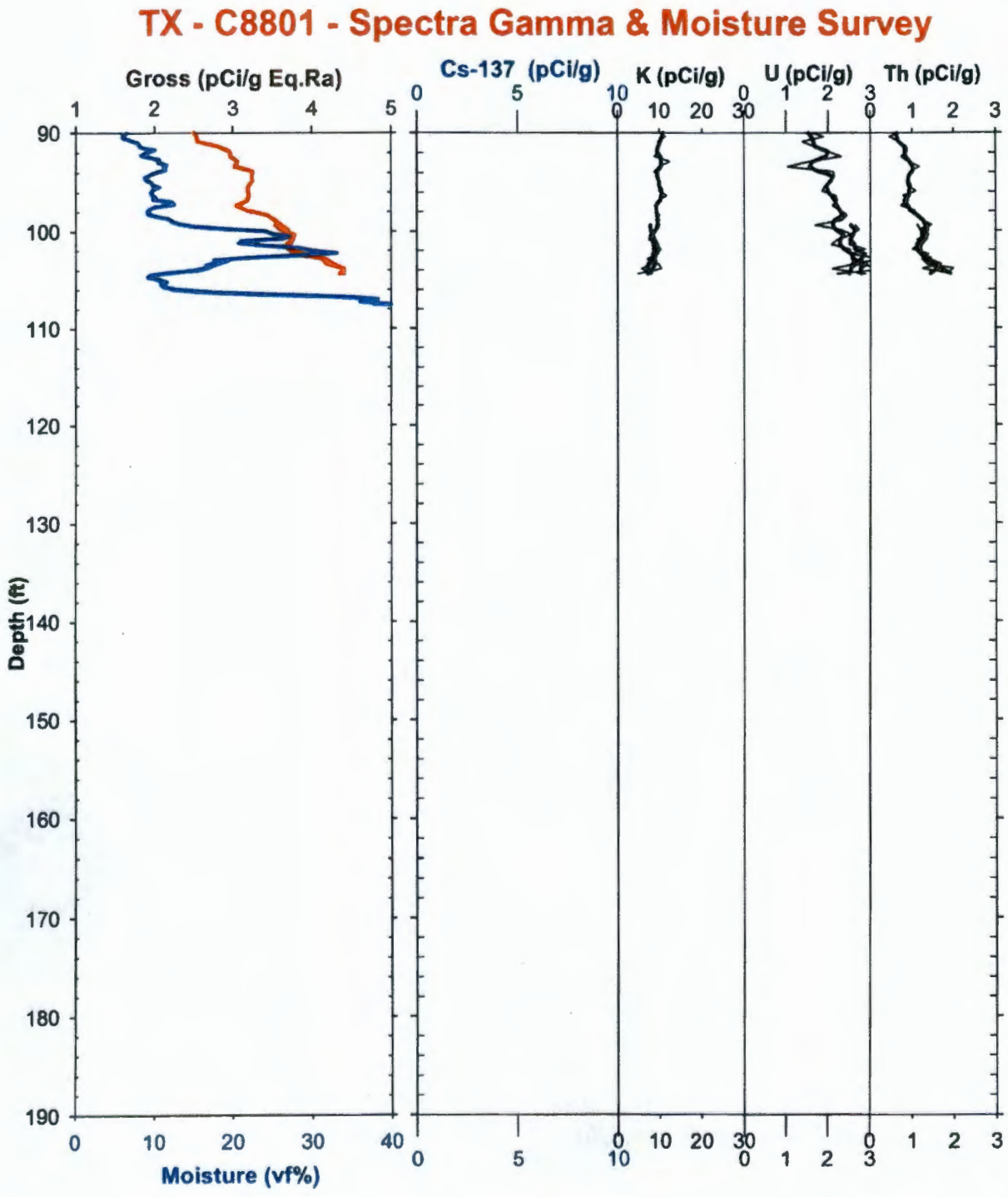
Moisture:

Moisture values range from 3-42%.

Calibration Certificates

Moisture	
Date:	Jan 25, 2013
Electronic File:	N2_097_2013-v0.zip
Gamma BGO	
Date:	Feb 4, 2013
Electronic File:	BGO-1_2013-v0.zip
LaBr	
Date:	Sep 13, 2012
Electronic File:	LaBr-1_2013-v0.zip


TX - C8801 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8801 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8803 Header Information

Small Diameter –Moisture Survey

Probehole:	C8803	Log Date:	September 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136268.65	Elevation:	204.95 m
Easting:	566826.91		672.50 ft.

9 Repeat/Overlap Intervals

Gamma:	103-98; 39-34; 36-39
Moisture:	60-55; 56.24-60
Temperature:	39-42

10 Observations

Gamma:

Cs-137 is observed in this borehole near surface. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

Moisture:

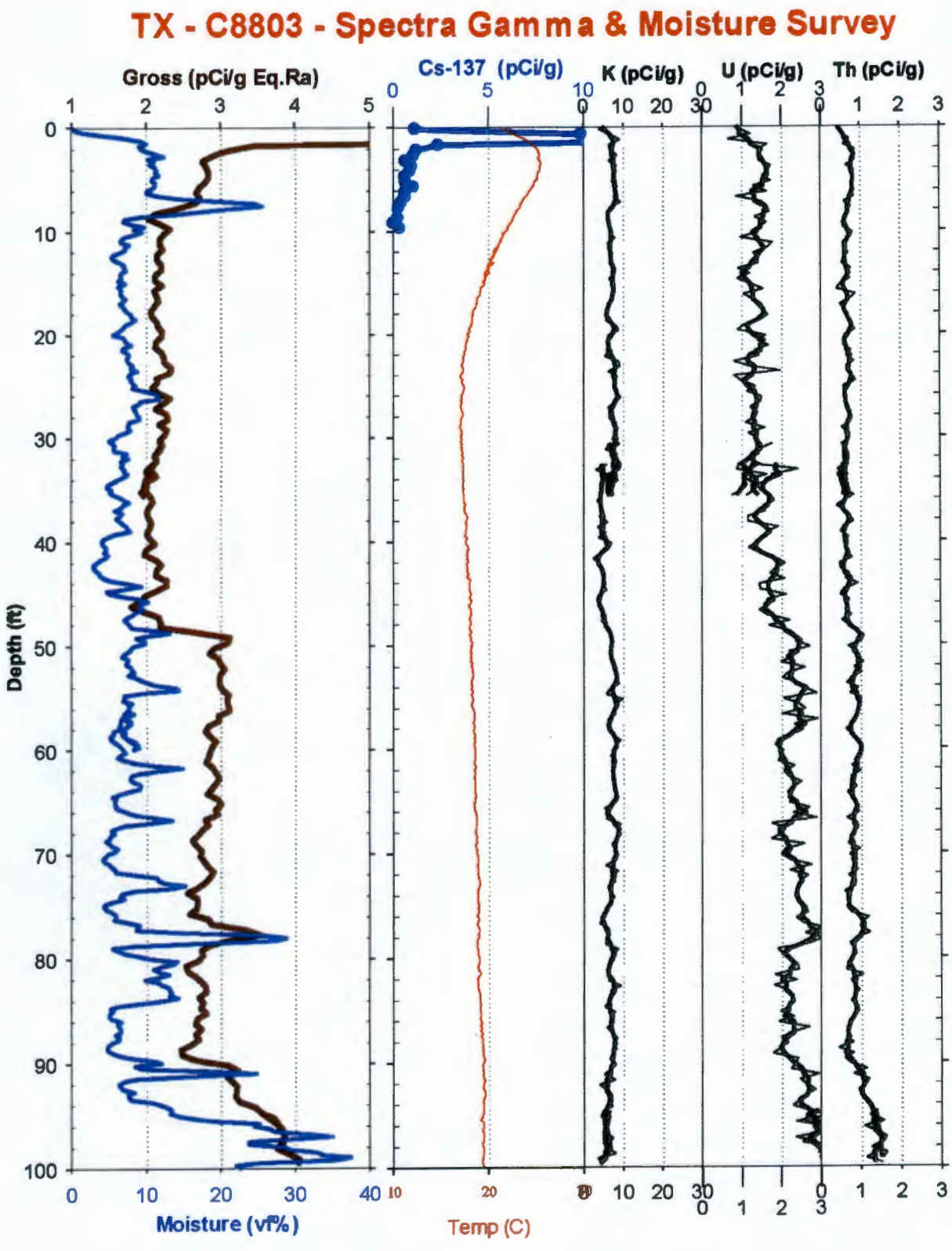
Moisture values range from 3-38%.

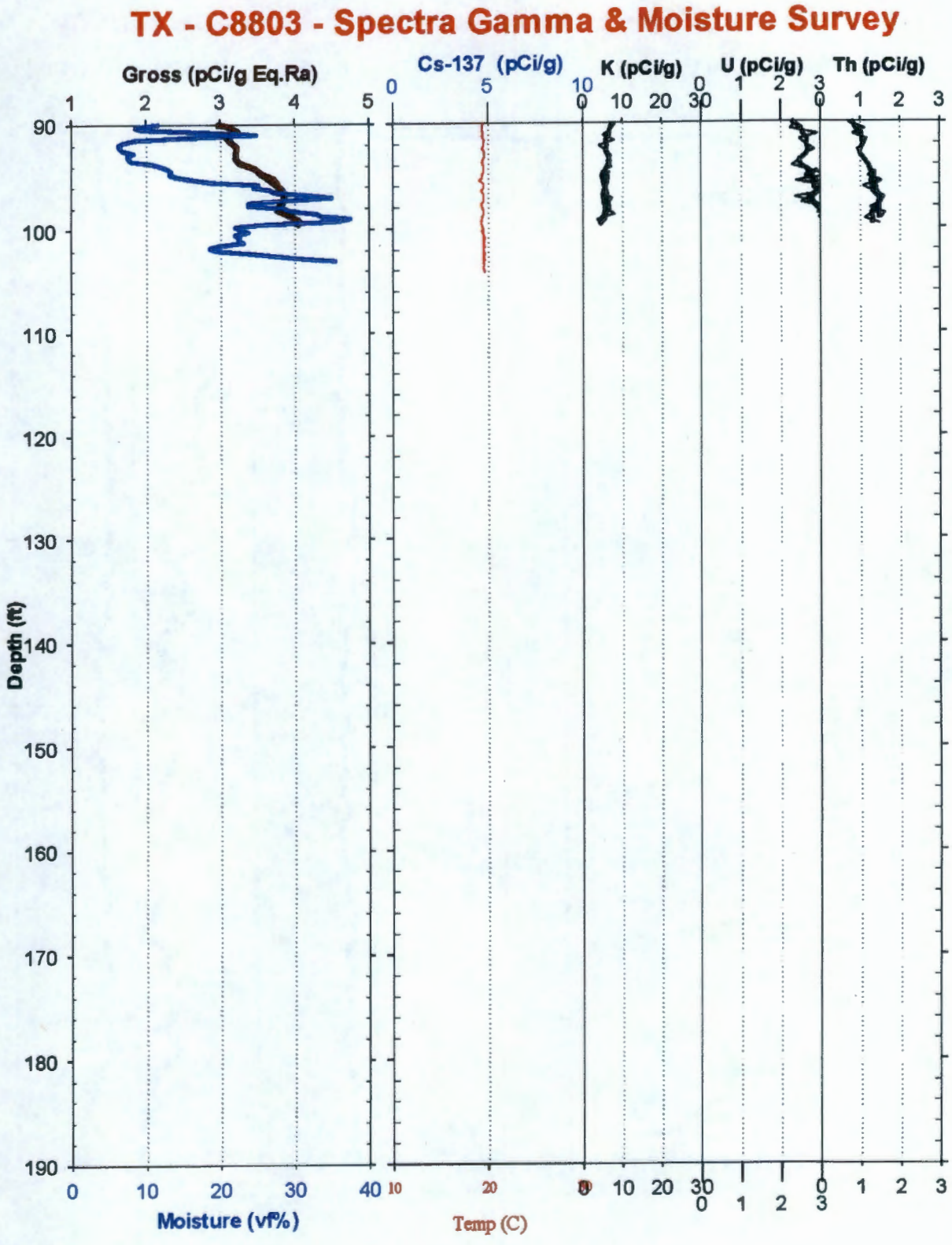
Temperature:

The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

11 Calibration Certificates

Moisture	
Date:	Sept 18, 2013
Electronic File:	Moist-2_2013-v1.zip
Gamma BGO	
Date:	Sept 18, 2013
Electronic File:	BGO-1_2013-v1.zip
Date:	Sept 4, 2013
Electronic File:	BGO-2_2013-v1.zip
LaBr	
Date:	Sep 13, 2012
Electronic File:	LaBr-1_2013-v0.zip
Date:	Sept 4, 2013
Electronic File:	LaBr-2_2013-v1.zip


TX - C8803 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8803 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

TX-Farm C8805 Header Information

Small Diameter –Moisture Survey

Probehole:	C8805	Log Date:	August 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136204.61	Elevation:	205.07 m
Easting:	566704.62		672.79 ft.

Repeat/Overlap Intervals

Gamma:	105-100 86.5-81.5 31.5-26.5	Moisture:	108.5-103.5

Observations

Gamma:

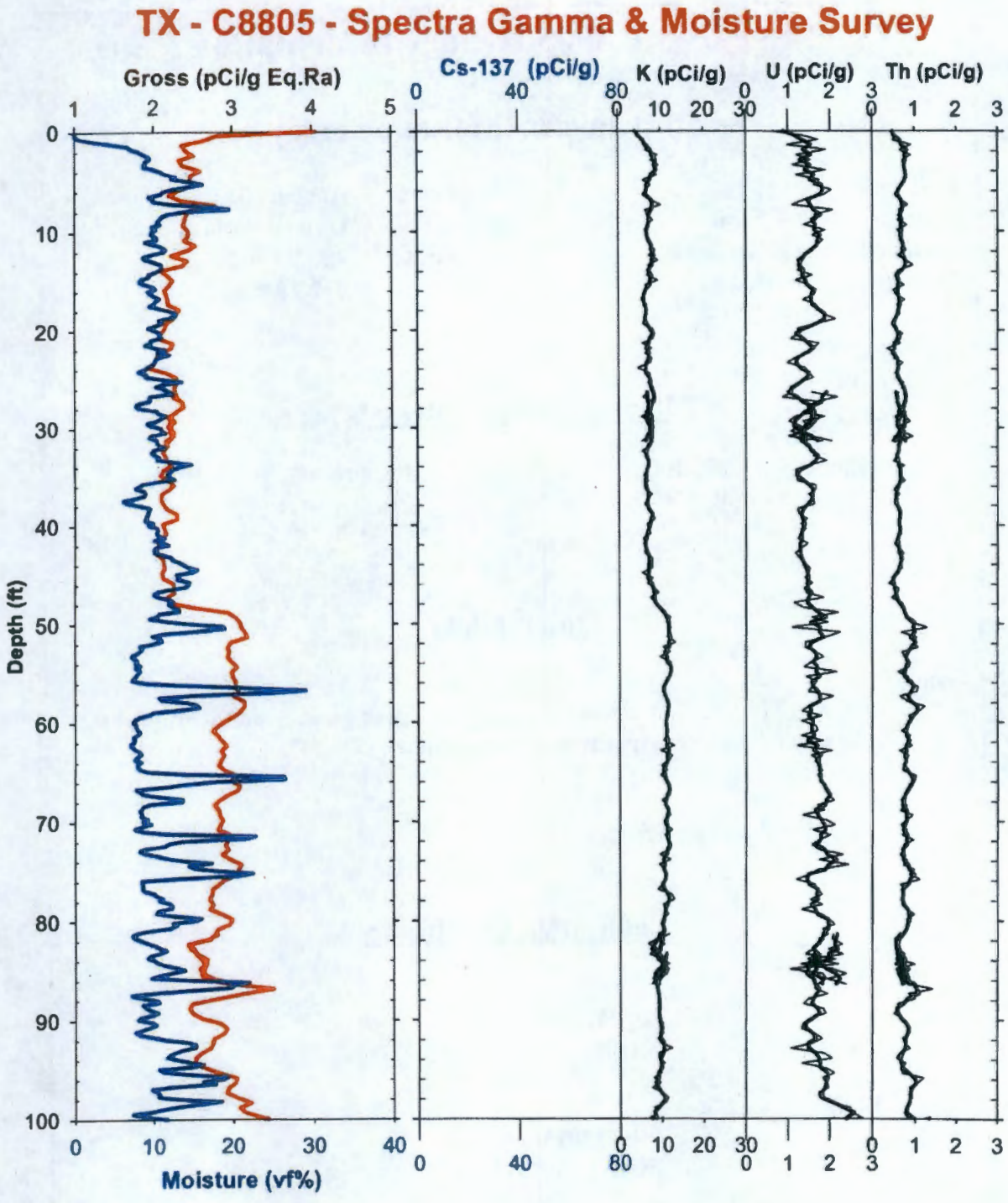
No Cs-137 is observed in this borehole. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

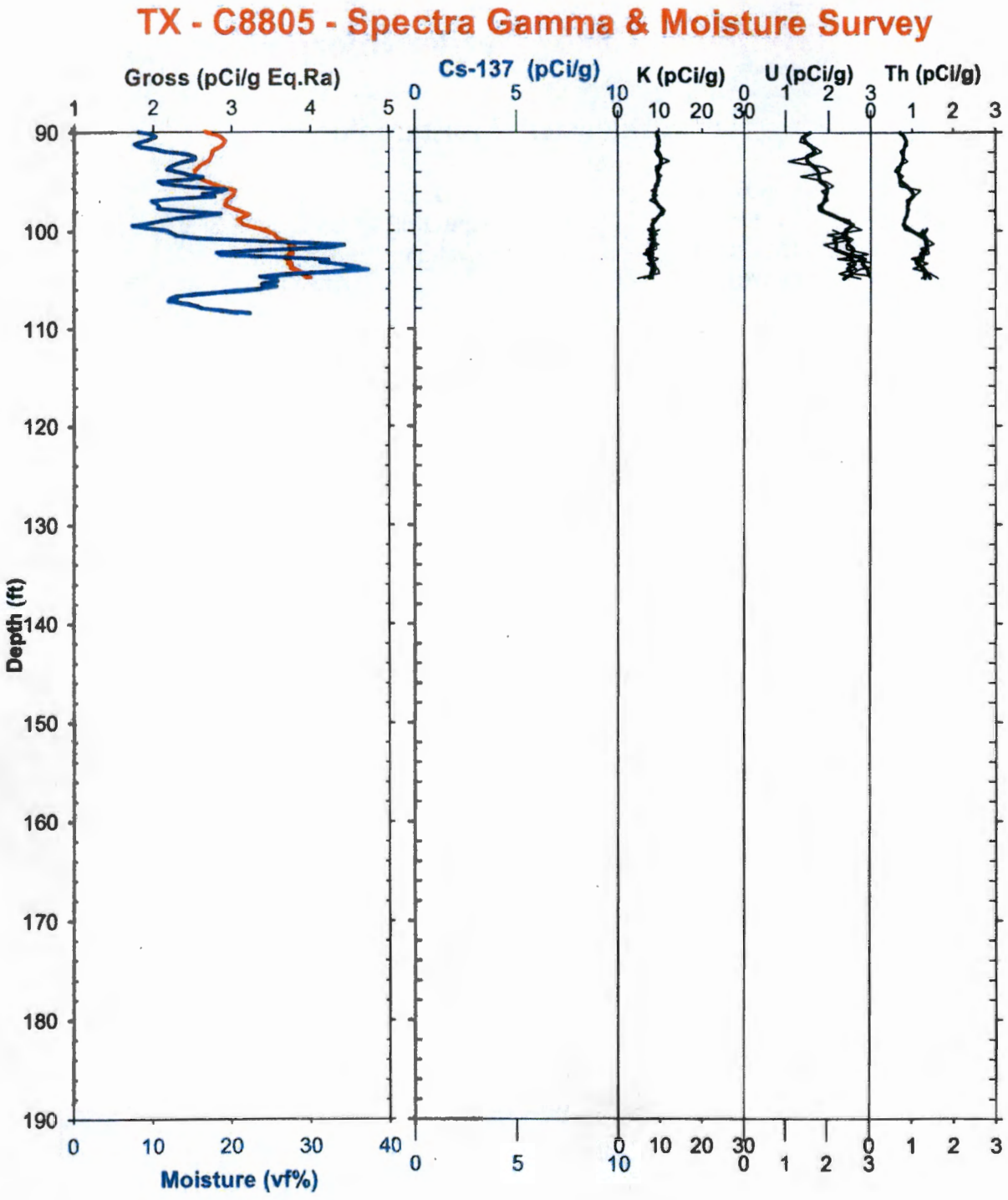
Moisture:

Moisture values range from 6-37%.

Calibration Certificates

Moisture	
Date:	Jan 25, 2013
Electronic File:	N2_097_2013-v0.zip
Gamma BGO	
Date:	Feb 4, 2013
Electronic File:	BGO-1_2013-v0.zip
LaBr	
Date:	Sep 13, 2012
Electronic File:	LaBr-1_2013-v0.zip


TX - C8805 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8805 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8807 Header Information

Small Diameter –Moisture Survey

Probehole:	C8807	Log Date:	August 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136130.43	Elevation:	204.97 m
Easting:	566701.66		672.46 ft.

Repeat/Overlap Intervals

Gamma:	97-92	Moisture:	110.5-105.5
	25.5-20.5		82-77

Observations

Gamma:

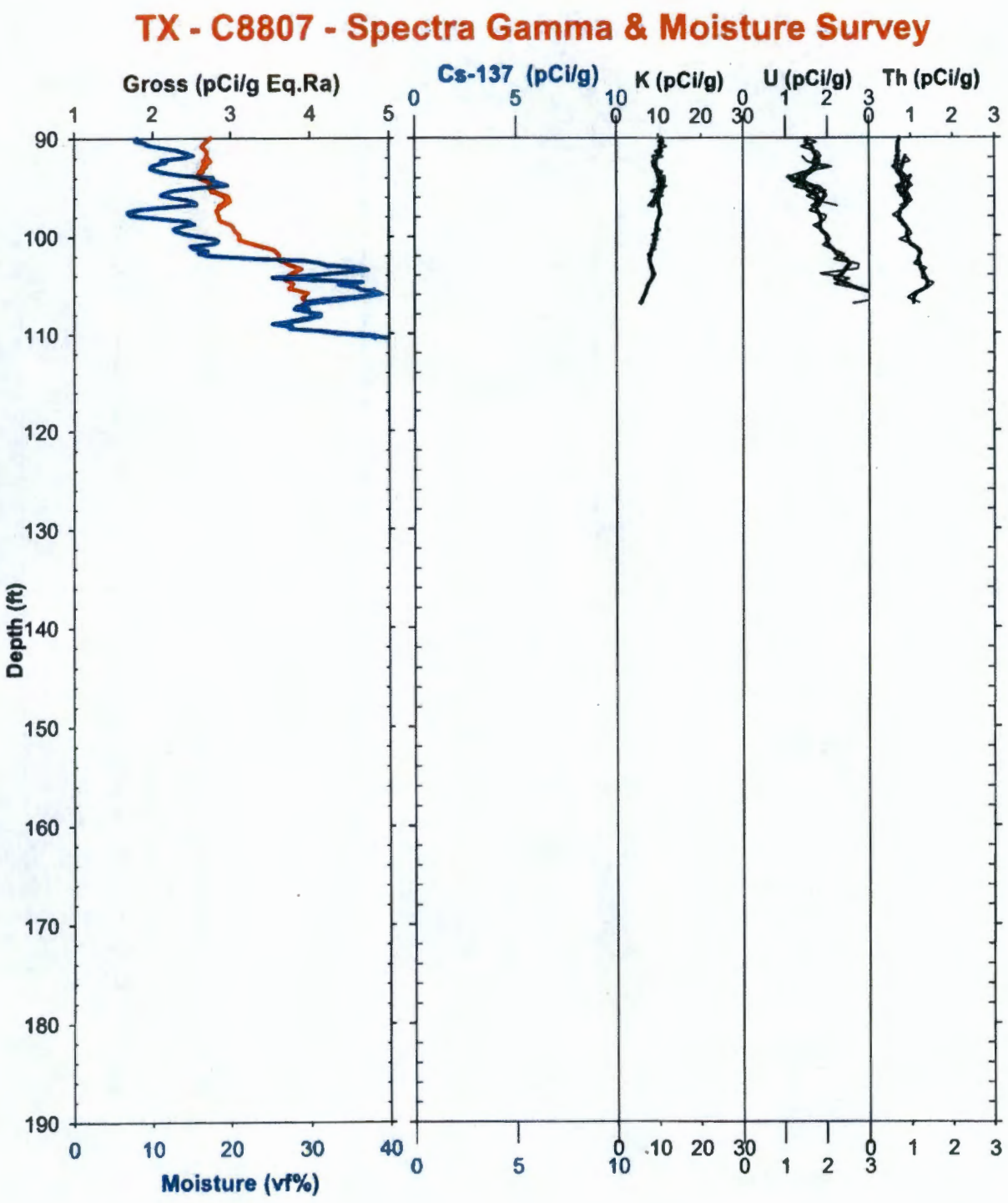
No Cs-137 is observed in this borehole. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

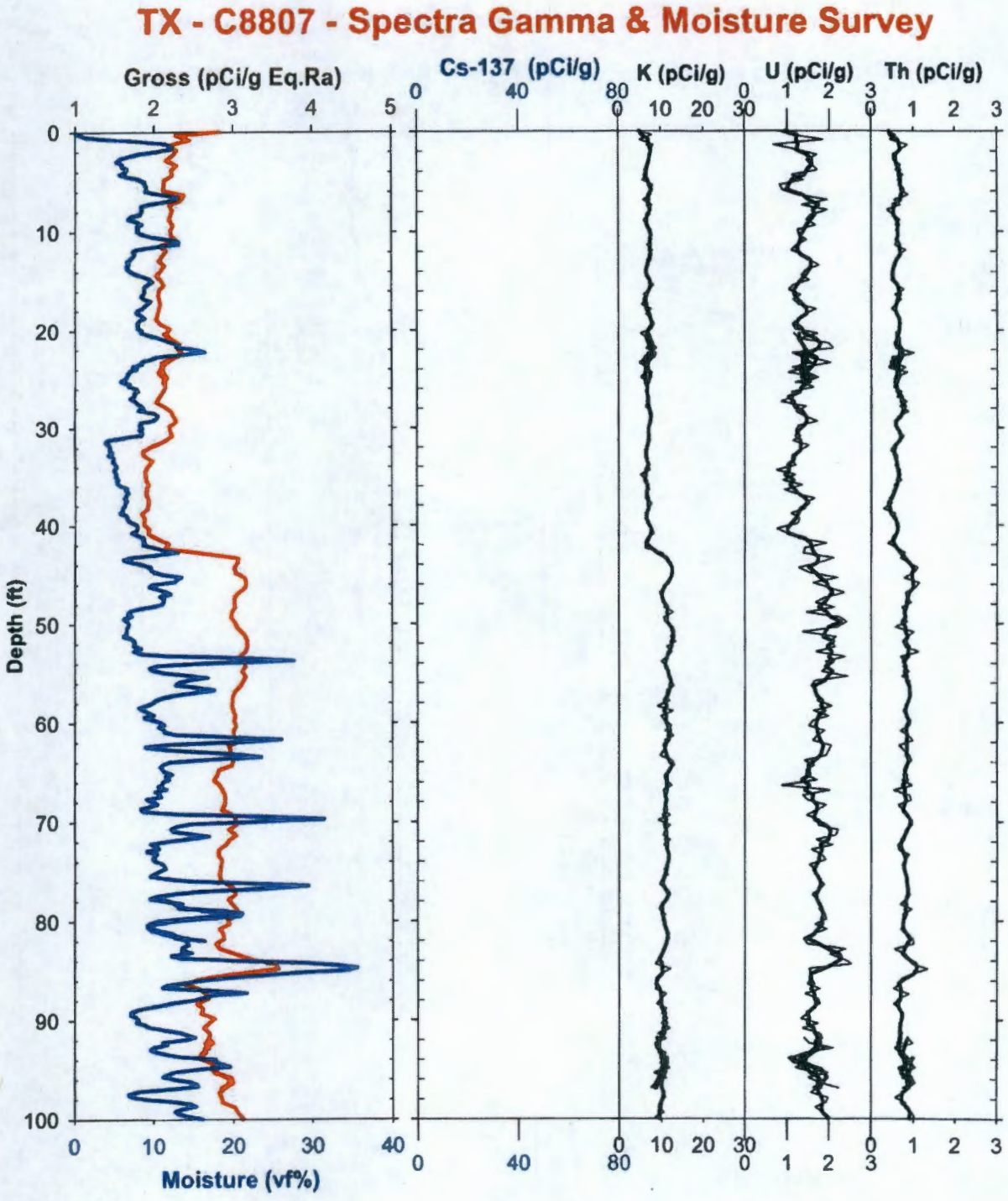
Moisture:

Moisture values range from 3-40%.

Calibration Certificates

Moisture	
Date:	Jan 25, 2013
Electronic File:	N2_097_2013-v0.zip
Gamma BGO	
Date:	Feb 4, 2013
Electronic File:	BGO-1_2013-v0.zip
LaBr	
Date:	Sep 13, 2012
Electronic File:	LaBr-1_2013-v0.zip


TX - C8807 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8807 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8809 Header Information

Small Diameter –Moisture Survey

Probehole:	C8809	Log Date:	June 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136124.78	Elevation:	205.09 m
Easting:	566734.34		672.7576 ft.

20 Repeat/Overlap Intervals

Gamma:	68-63; 65-68
Moisture:	110.5-105.5; 30-25; 27-30
Temperature:	Not Available

21 Observations

Gamma:

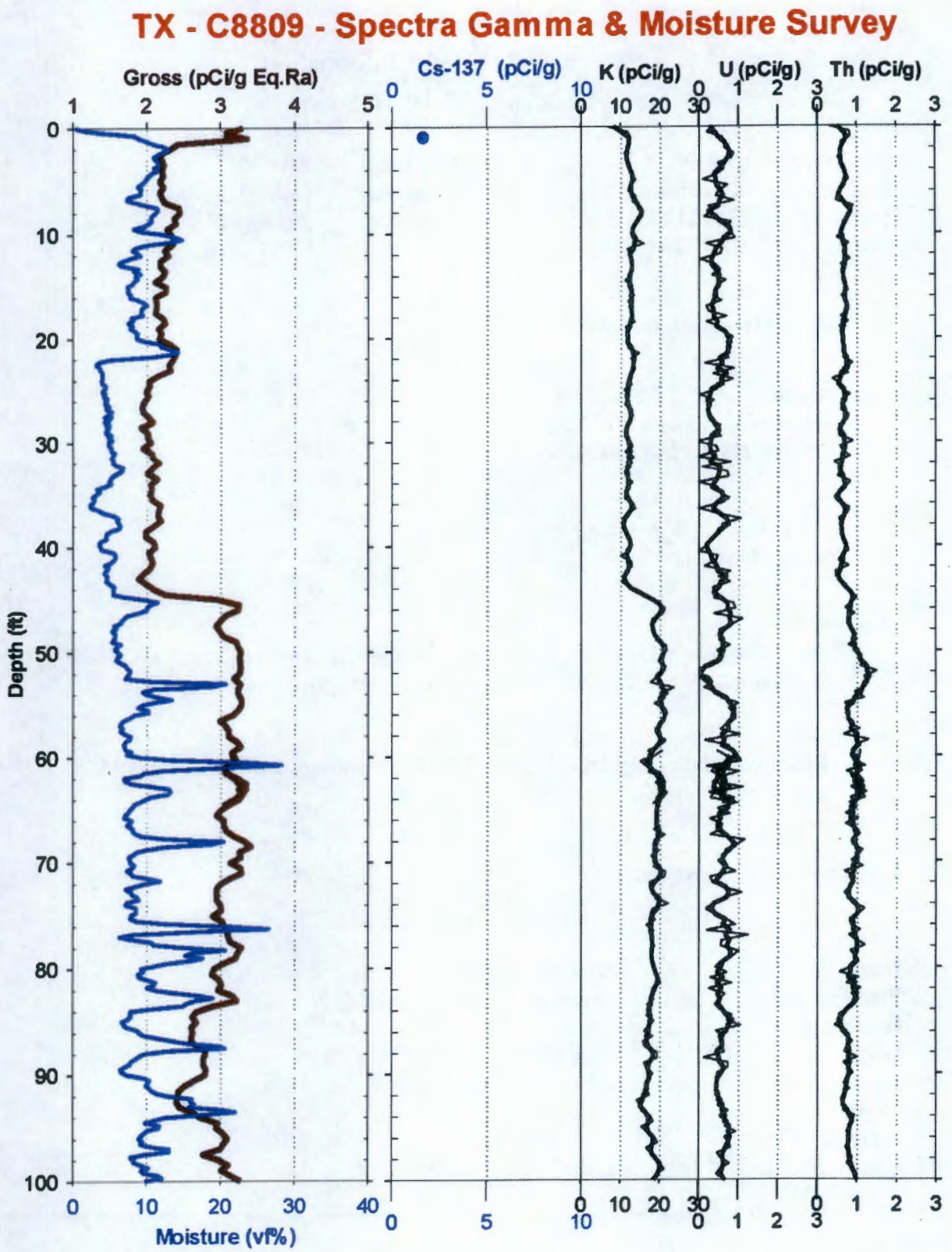
Cs-137 is observed in this borehole near surface. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

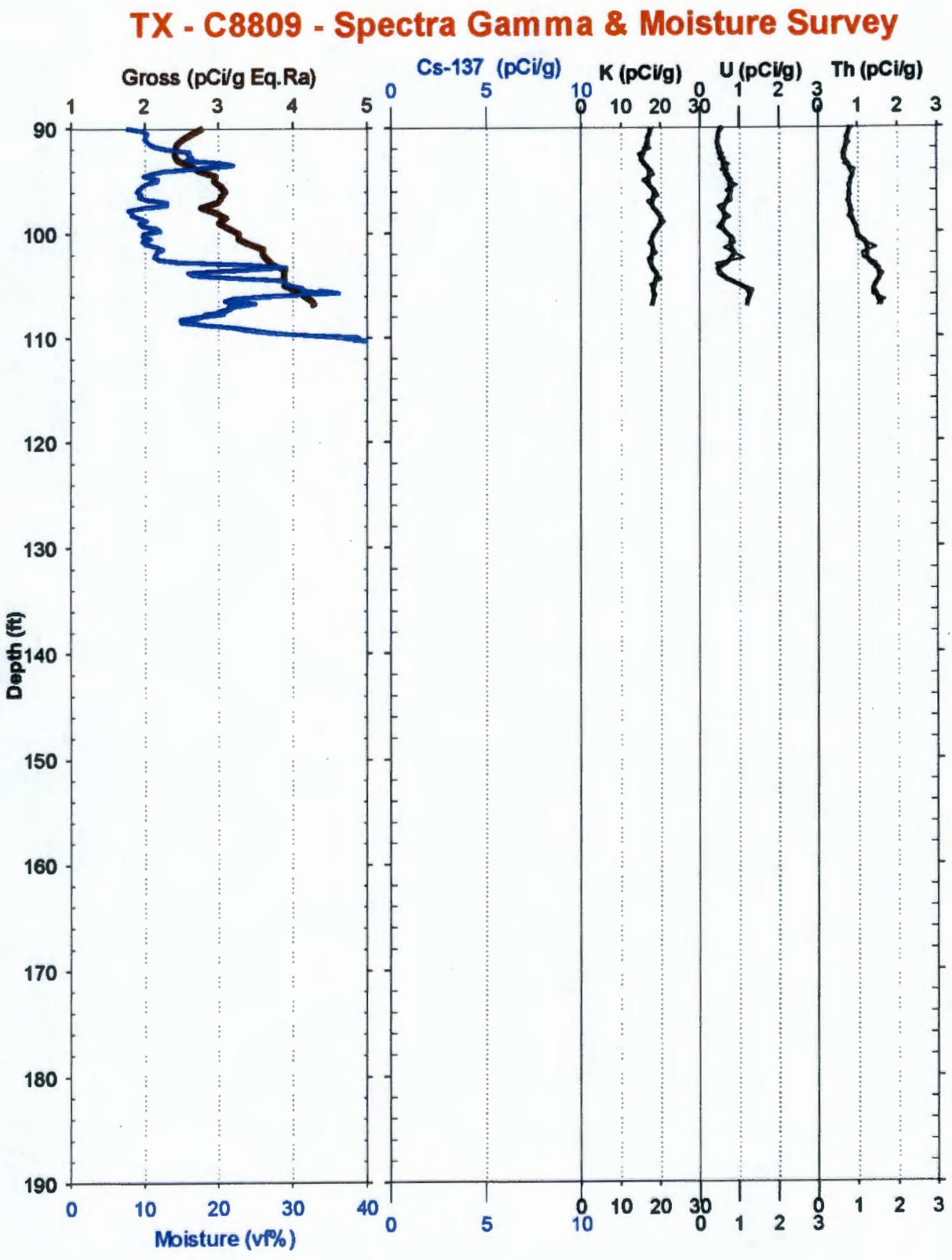
Moisture:

Moisture values range from 3-39%. Thin bed responses are visible from 95 pipe-ft to 50 pipe-ft.

22 Calibration Certificates

Moisture	
Date:	Sept 18, 2013
Electronic File:	Moist-2_2013-v1.zip
Gamma BGO	
Date:	Sept 18, 2013
Electronic File:	BGO-1_2013-v1.zip
LaBr	
Date:	Sept 18, 2013
Electronic File:	LaBr-1_2013-v1.zip


TX - C8809 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8809 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8811 Header Information

Small Diameter –Moisture Survey

Probehole:	C8811	Log Date:	June 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136130.95	Elevation:	206.26 m
Easting:	566793.30		676.4616 ft.

24 Repeat/Overlap Intervals

Gamma: 112.7-107.7; 36-31; 109.7-112.7; 32.7-36
Moisture: none
Temperature: Not Available

25 Observations

Gamma:

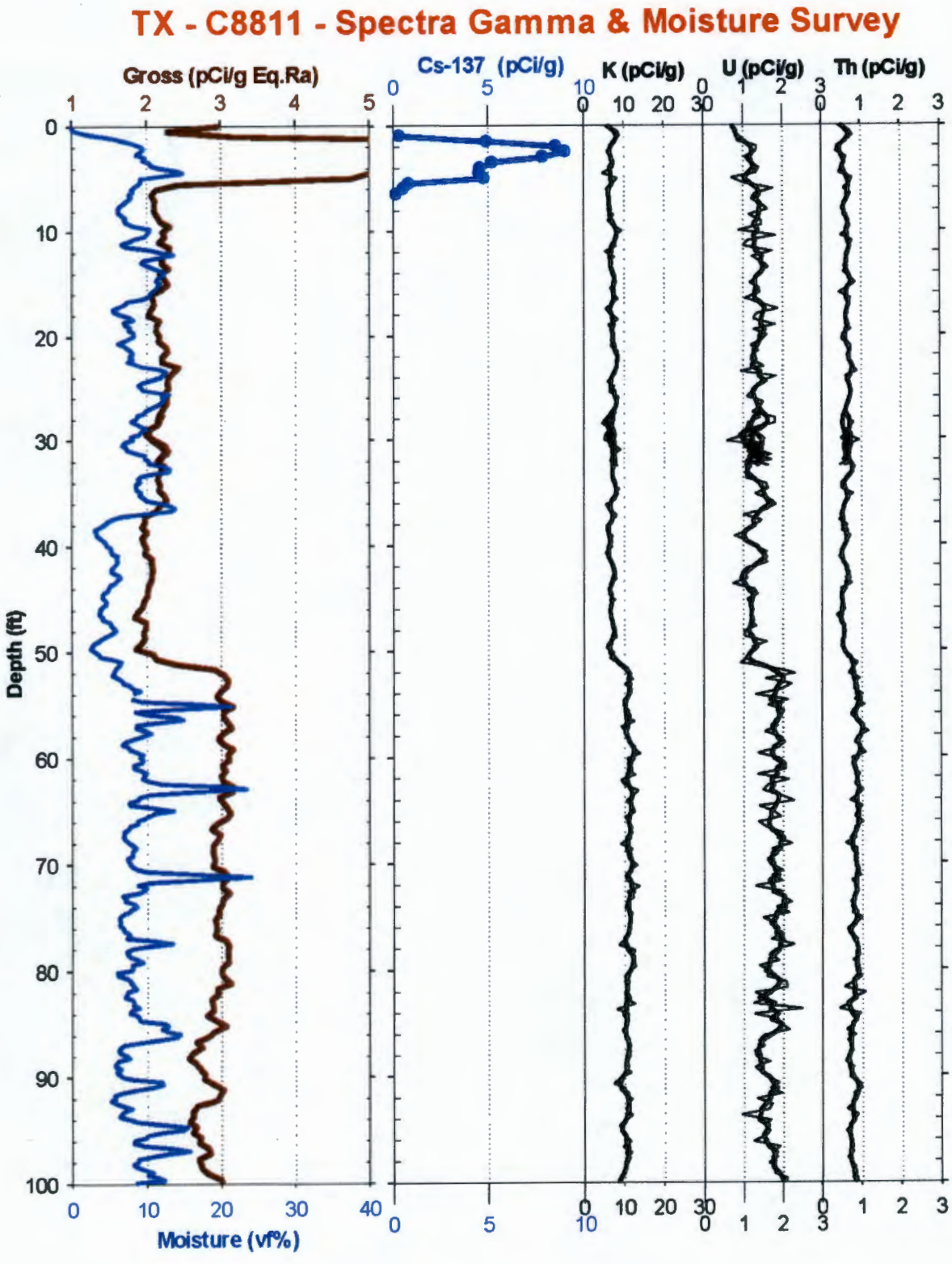
Cs-137 is observed in this borehole near surface. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

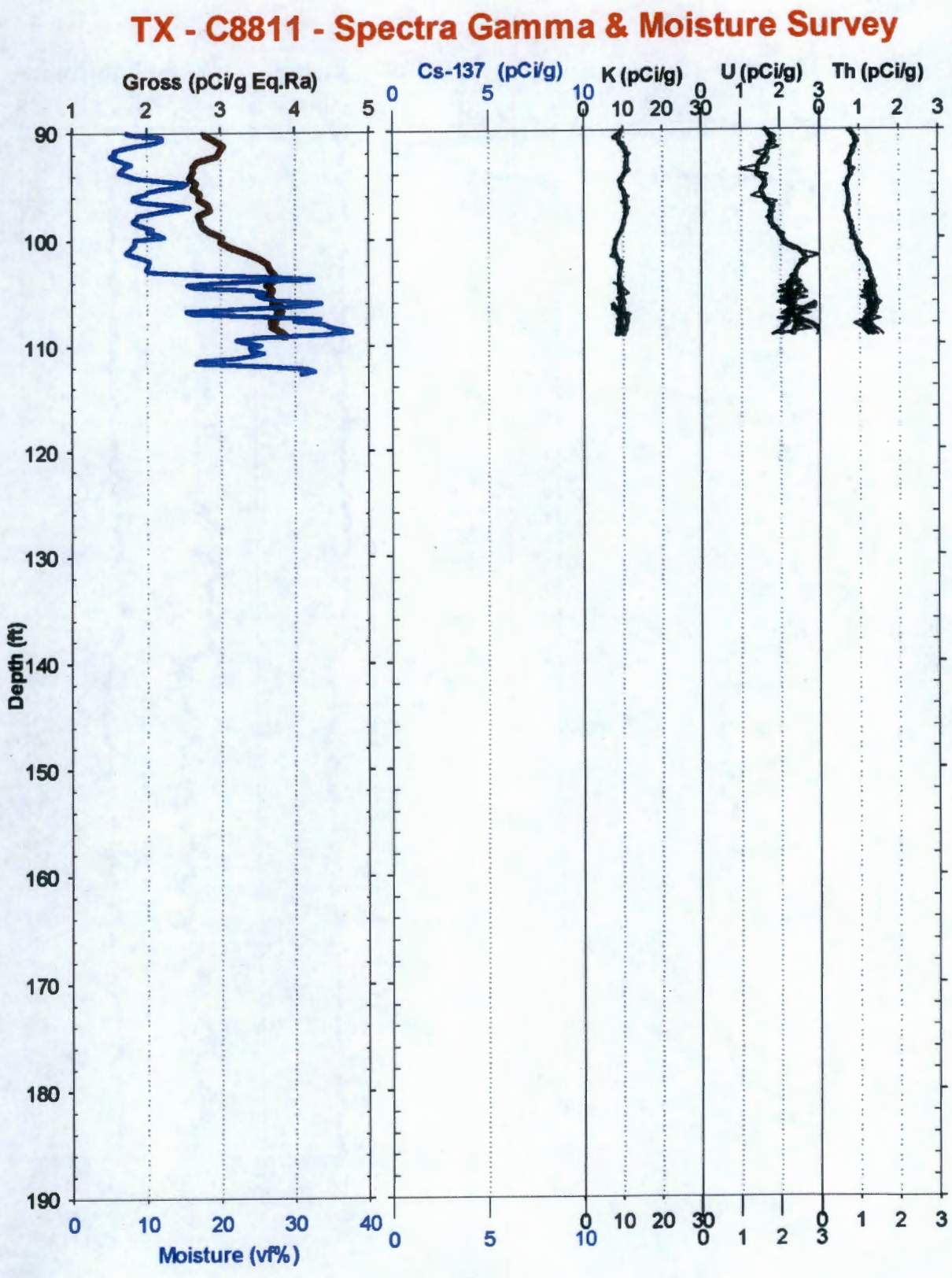
Moisture:

Moisture values range from 3-38%. Thin bed responses are visible from 78 pipe-ft to 55 pipe-ft.

26 Calibration Certificates

Moisture
Date: Sept 18, 2013
Electronic File: Moist-2_2013-v1.zip
Gamma BGO
Date: Sept 18, 2013
Electronic File: BGO-1_2013-v1.zip
LaBr
Date: Sept 18, 2013
Electronic File: LaBr-1_2013-v1.zip


TX - C8811 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8811 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8813 Header Information

Small Diameter –Moisture Survey

Probehole:	C8813	Log Date:	July 2013
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136123.42	elev.	204.68 m
Easting:	566831.67		671.52

Repeat/Overlap Intervals

Gamma:	103-98	Moisture:	106.5-101.5
	88.5-83.5		83-78
	11.5-6.5		

Observations

Gamma:

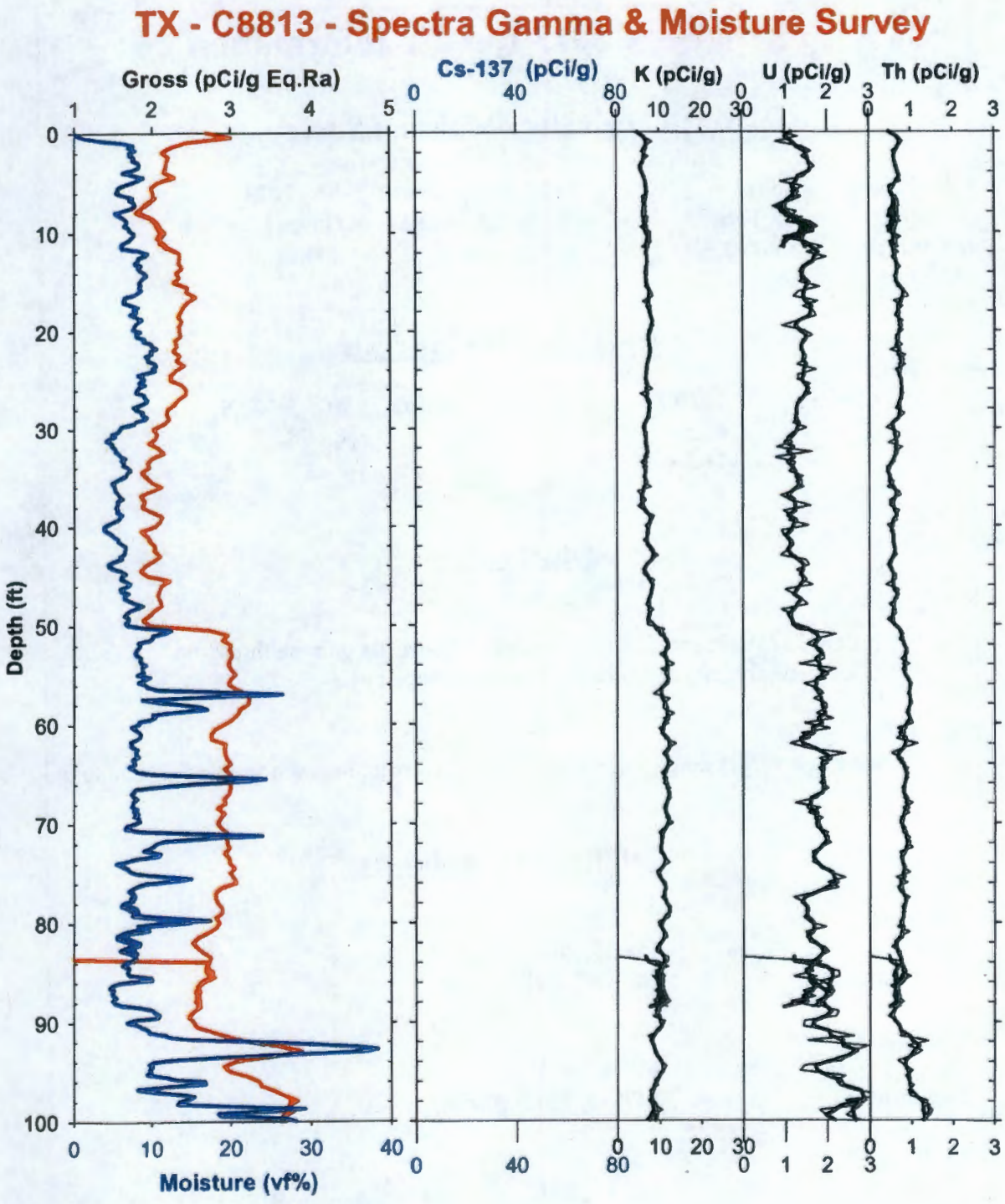
No Cs-137 is observed in this borehole. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

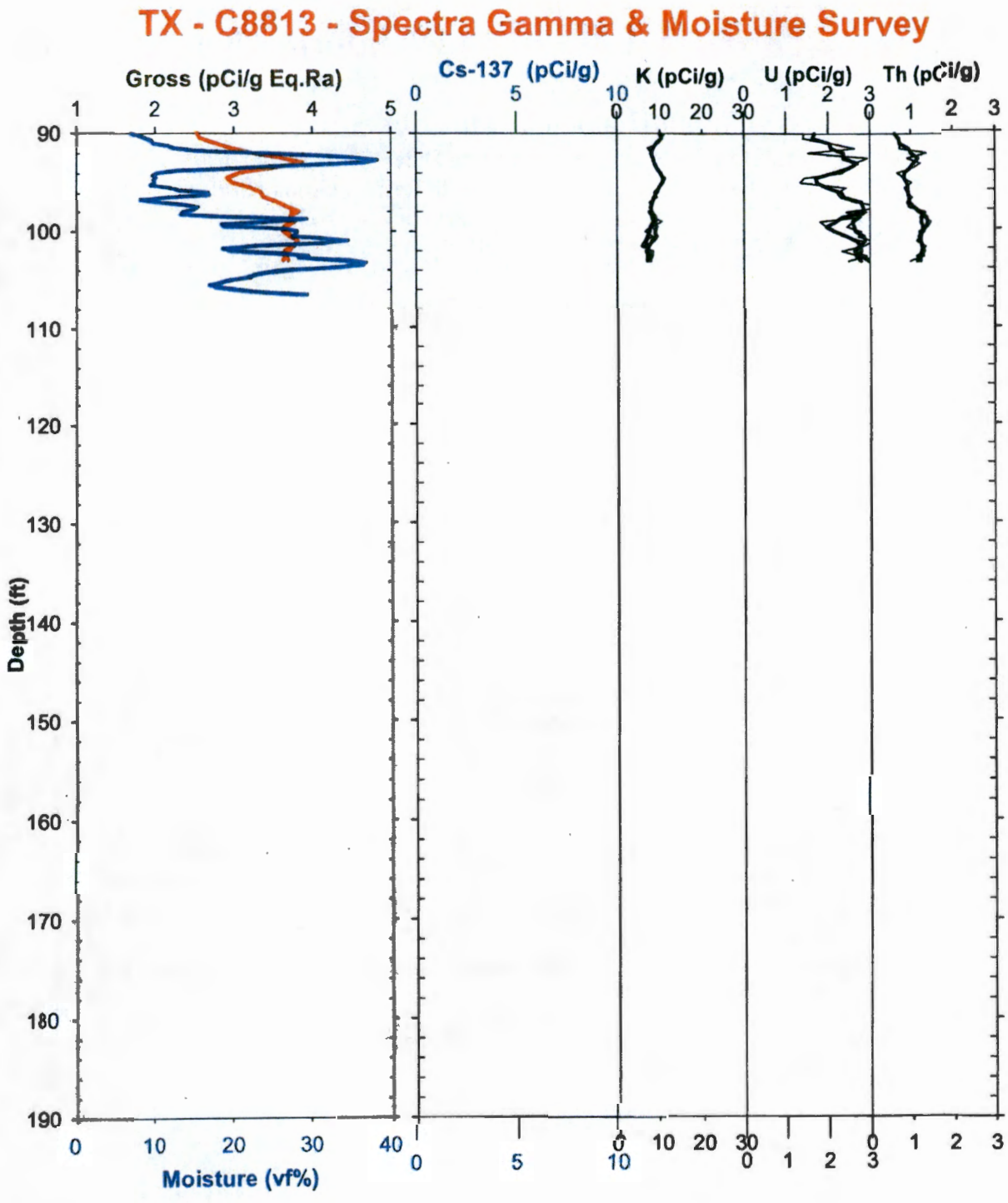
Moisture:

Moisture values range from 4-38%. Thin bed responses are visible from 56 to 80 feet.

Calibration Certificates

Moisture	
Date:	Jan 25, 2013
Electronic File:	N2_097_2013-v0.zip
Gamma BGO	
Date:	Feb 4, 2013
Electronic File:	BGO-1_2013-v0.zip
LaBr	
Date:	Sep 13, 2012
Electronic File:	LaBr-1_2013-v0.zip


TX - C8813 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)


TX - C8813 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)

TX-Farm C8815 Header Information

Small Diameter –Moisture Survey

Probehole:	C8815	Log Date:	January 2014
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136149.13	Elevation:	205.35 m
Easting:	566724.21		673.72 ft.

Repeat/Overlap Intervals

Gamma: 113-108; 53-48; 50-53
Moisture: 113-108; 53-48; 50-53
Temperature: 53-56

Observations

Gamma:

Co-60 is observed between 69 to 71 feet. The maximum reading of Co-60 at 69.5 feet is 12.9 pCi/g. The log response for cobalt in this interval is lower than the real value due to thin bed response. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Co-60 or Cs-137. The interval from 75ft to 69ft has too much interference form the cobalt to have an accurate reading of K-40 from the BGO detector. Therefore the LaBr was used, only this interval, to produce the K-40 readings. Plotted on the same scale and color is the Cs-137 near the surface from 1.5ft to 0 at less than 1pCi/g.

Moisture:

Moisture values range from 3-48%.

Temperature:

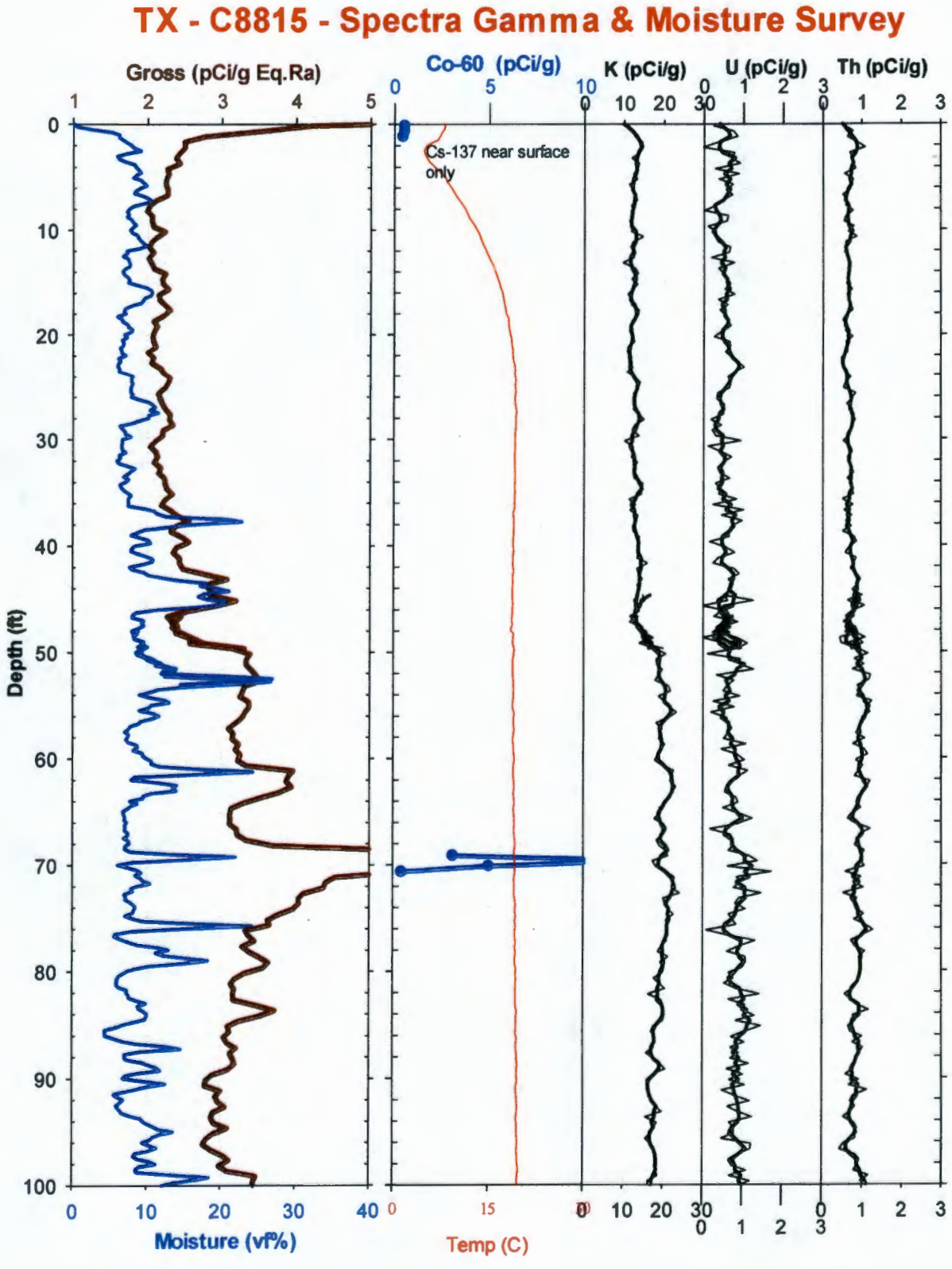
The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

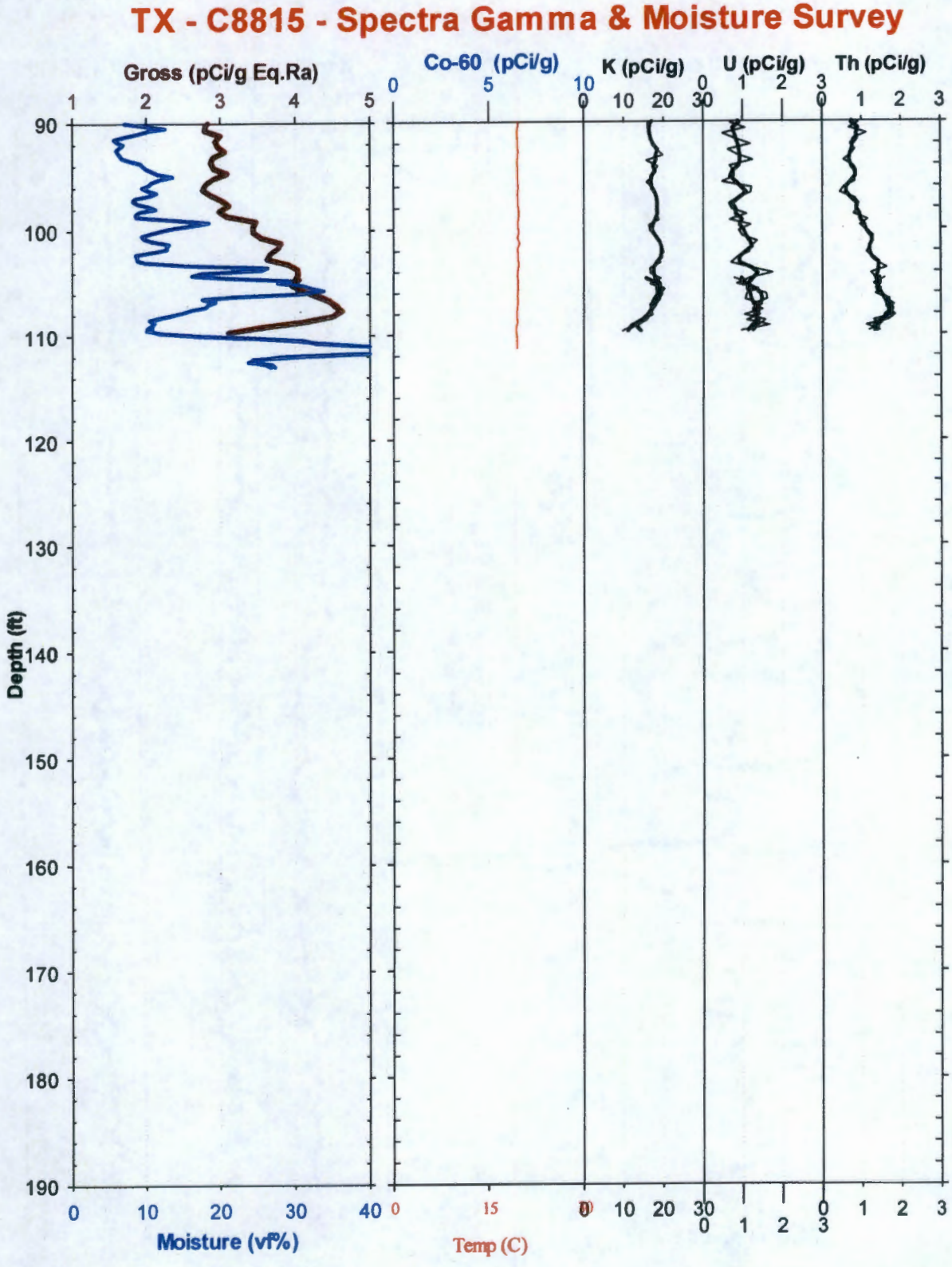
Calibration Certificates

Moisture
Date: Sept 18, 2013
Electronic File: Moist-2_2013-v1.zip

Gamma BGO
Date: Sept 18, 2013
Electronic File: BGO-1_2013-v1.zip

LaBr
Date: Sept 4, 2013
Electronic File: LaBr-2_2013-v1.zip


TX - C8815 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Co-60 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Cs-137 near surface only
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8815 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Co-60 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

TX-Farm C8817 Header Information

Small Diameter –Moisture Survey

Probehole:	C8817	Log Date:	January 2014
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136169.05	Elevation:	205.55 m
Easting:	566733.80		674.38 ft.

Repeat/Overlap Intervals

Gamma:	111.3-106; 47-42; 44-47
Moisture:	50-45; 47.24-50
Temperature:	47-50

Observations

Gamma:
Co-60 is observed between 51 and 82 feet. The maximum Co-60 is observed at 59.5 feet with a reading of 21 pCi/g. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137 observed near surface and Co-60 from 53-75ft. The BGO readings of K-40 cannot be obtained over this interval due to Co-60 interference. Therefore the LaBr data were processed, only in this interval, to produce the K-40 readings, and the BGO data were processed for the remainder of the depths. Plotted on the same scale and color is the Cs-137 detected near the surface only.

Moisture:
Moisture values range from 3-48%.

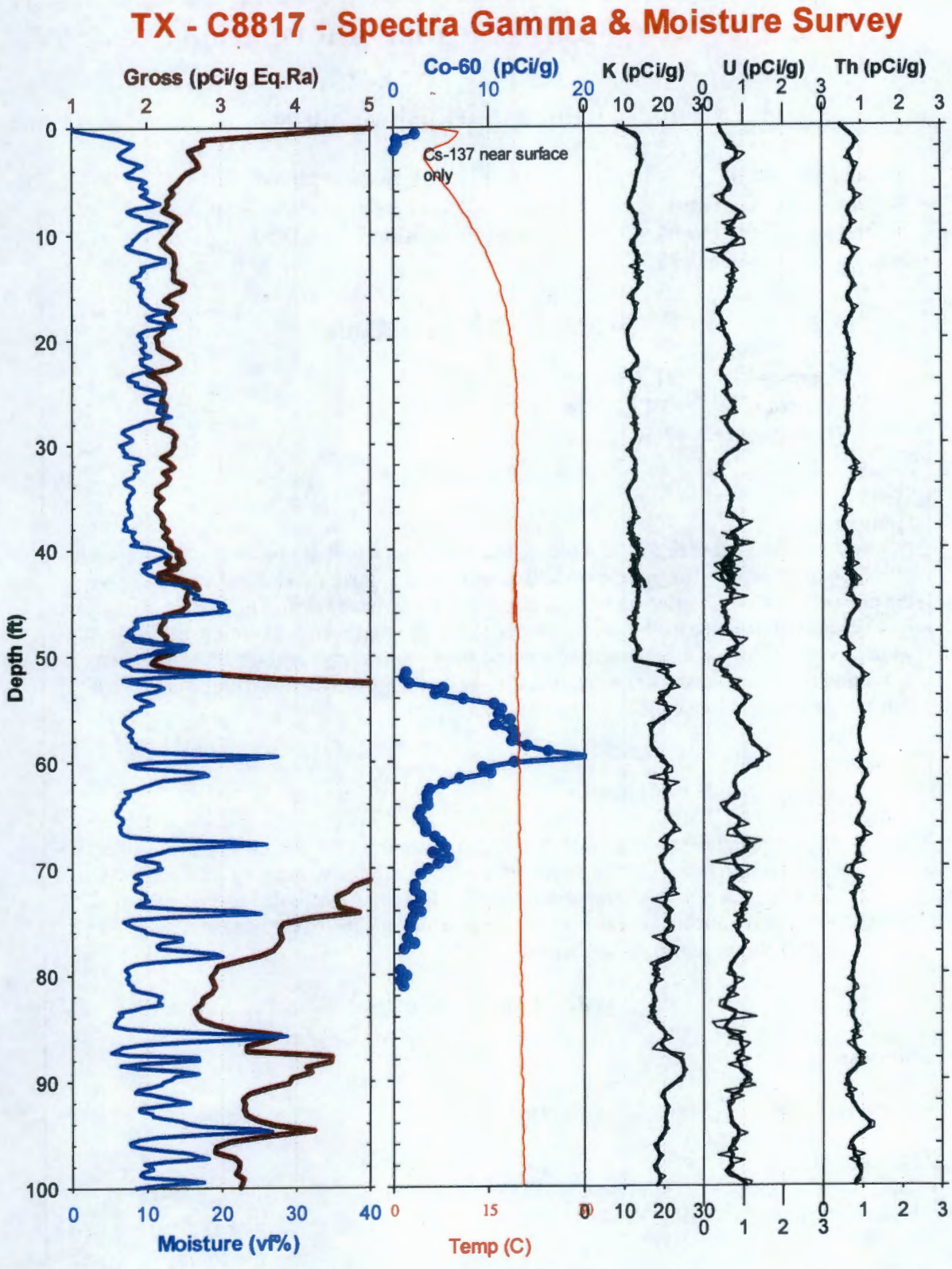
Temperature:
The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

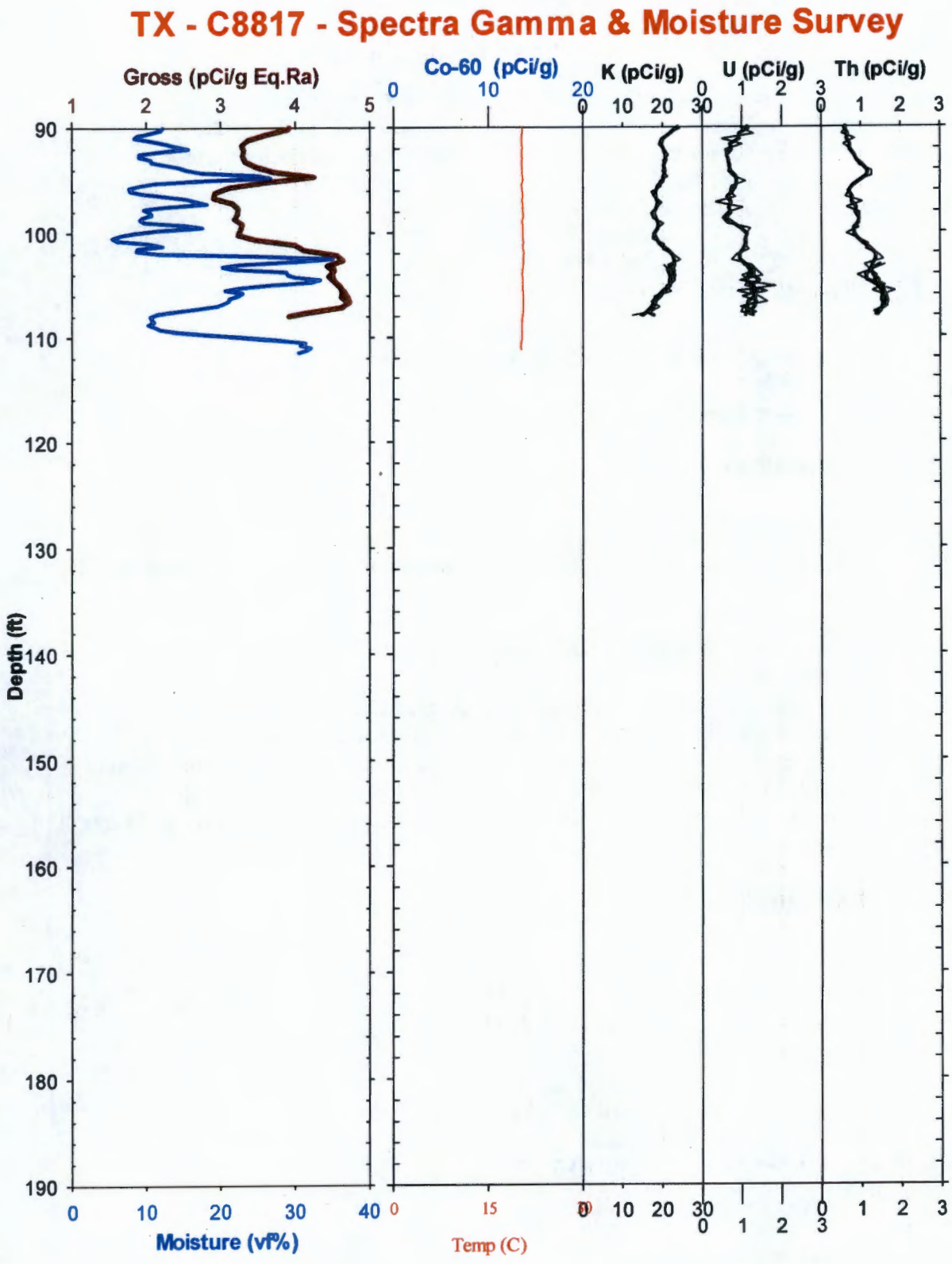
Calibration Certificates

Moisture
Date: Sept 18, 2013
Electronic File: Moist-2_2013-v1.zip

Gamma BGO
Date: Sept 18, 2013
Electronic File: BGO-1_2013-v1.zip

LaBr
Date: Sept 4, 2013
Electronic File: LaBr-2_2013-v1.zip


TX - C8817 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Co-60 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Cs-137 near surface only
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8817 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Co-60 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

TX-Farm C8819 Header Information

Small Diameter –Moisture Survey

Probehole:	C8819	Log Date:	February 2014
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136238.24	Elevation:	205.78 m
Easting:	566782.36		675.23 ft.

39 Repeat/Overlap Intervals

Gamma:	108.9-103.5; 50-45; 47-50
Moisture:	109-104
Temperature:	50-53

40 Observations

Gamma:

The Cs-137 near the surface from 2.5ft to 0.5 is less than 6pCi/g. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

Moisture:

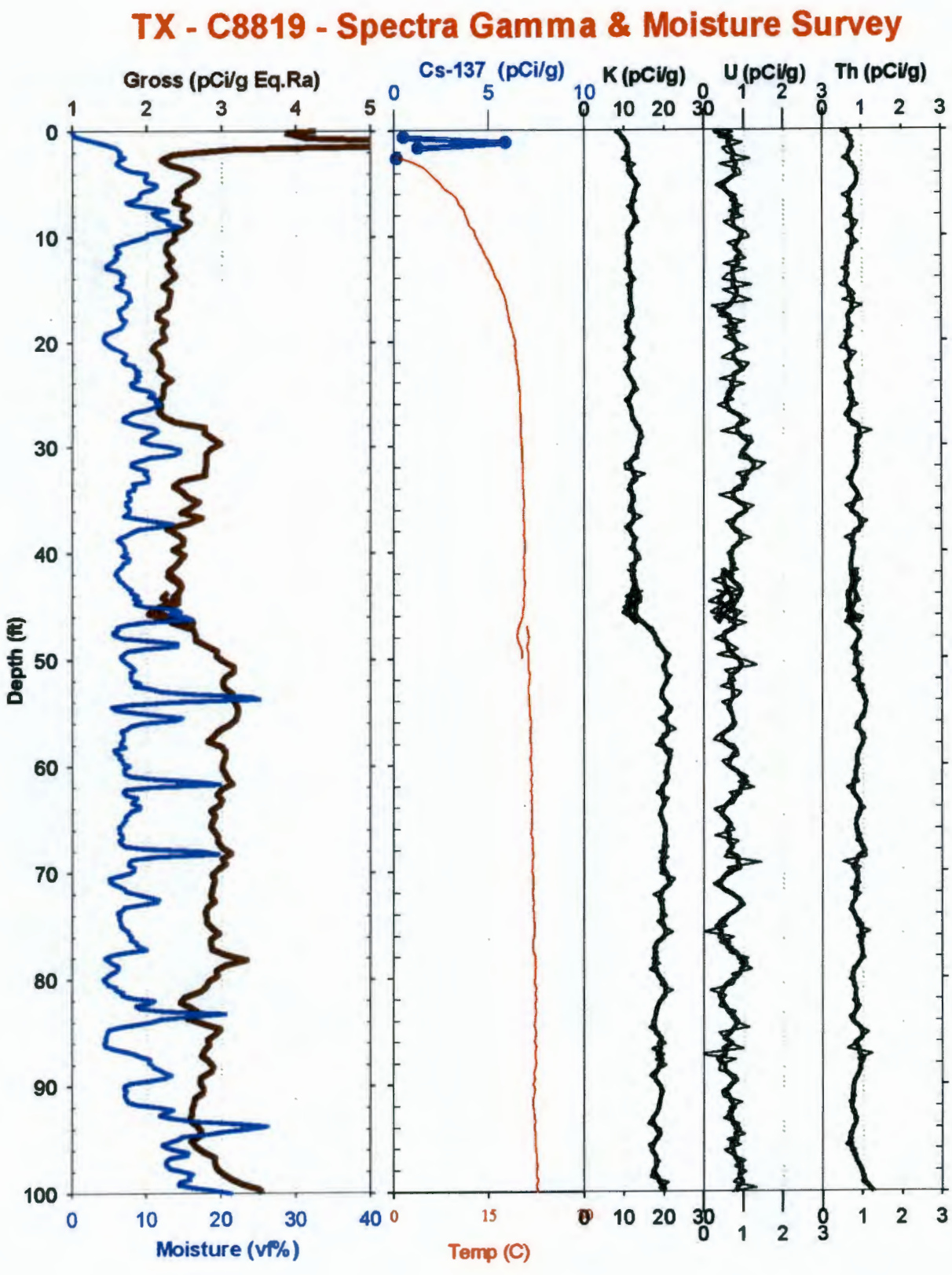
Moisture values range from 4-36%.

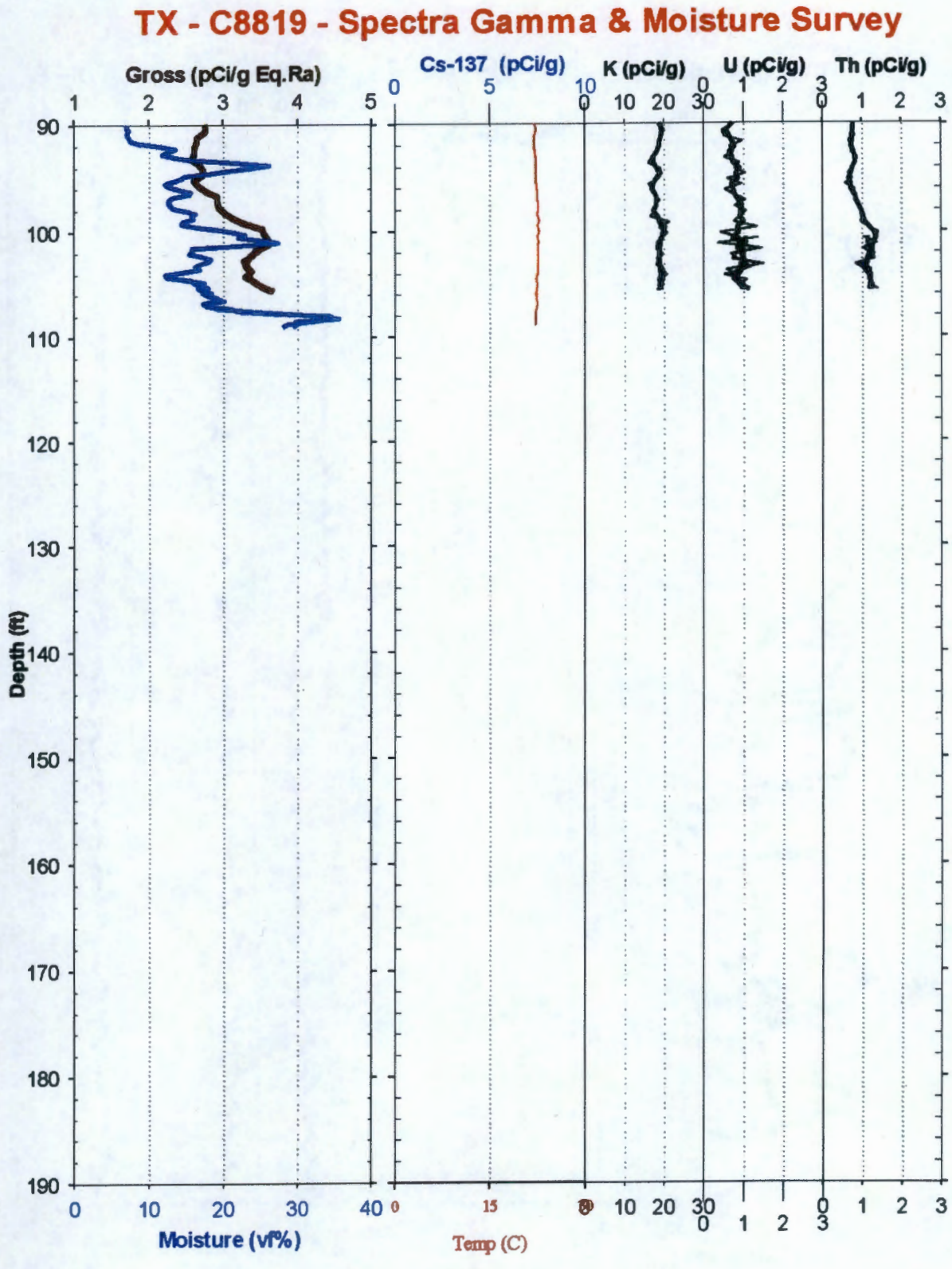
Temperature:

The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

41 Calibration Certificates

Moisture	
Date:	Sept 18, 2013
Electronic File:	Moist-2_2013-v1.zip
Gamma BGO	
Date:	Sept 18, 2013
Electronic File:	BGO-1_2013-v1.zip
Date:	Sept 4, 2013
Electronic File:	BGO-2_2013-v1.zip
LaBr	
Date:	Sept 4, 2013
Electronic File:	LaBr-2_2013-v1.zip


TX - C8819 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8819 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

TX-Farm C8821 Header Information

Small Diameter –Moisture Survey

Probehole:	C8821	Log Date:	February 2014
Project:	TX Farm	Depth Ref:	Ground Surface
Northing:	136264.57	Elevation:	205.48 m
Easting:	566771.76		674.15 ft.

43 Repeat/Overlap Intervals

Gamma:	108.5-103.5; 92.5-87.5; 53-48; 89.5-92.5; 50-53
Moisture:	108.5-103.5
Temperature:	53-56

44 Observations

Gamma:

The Cs-137 near the surface from 6 ft to 0 ft is less than 8pCi/g. The gross gamma threshold is set at 50keV and therefore responsive to the presence of Cs-137.

Moisture:

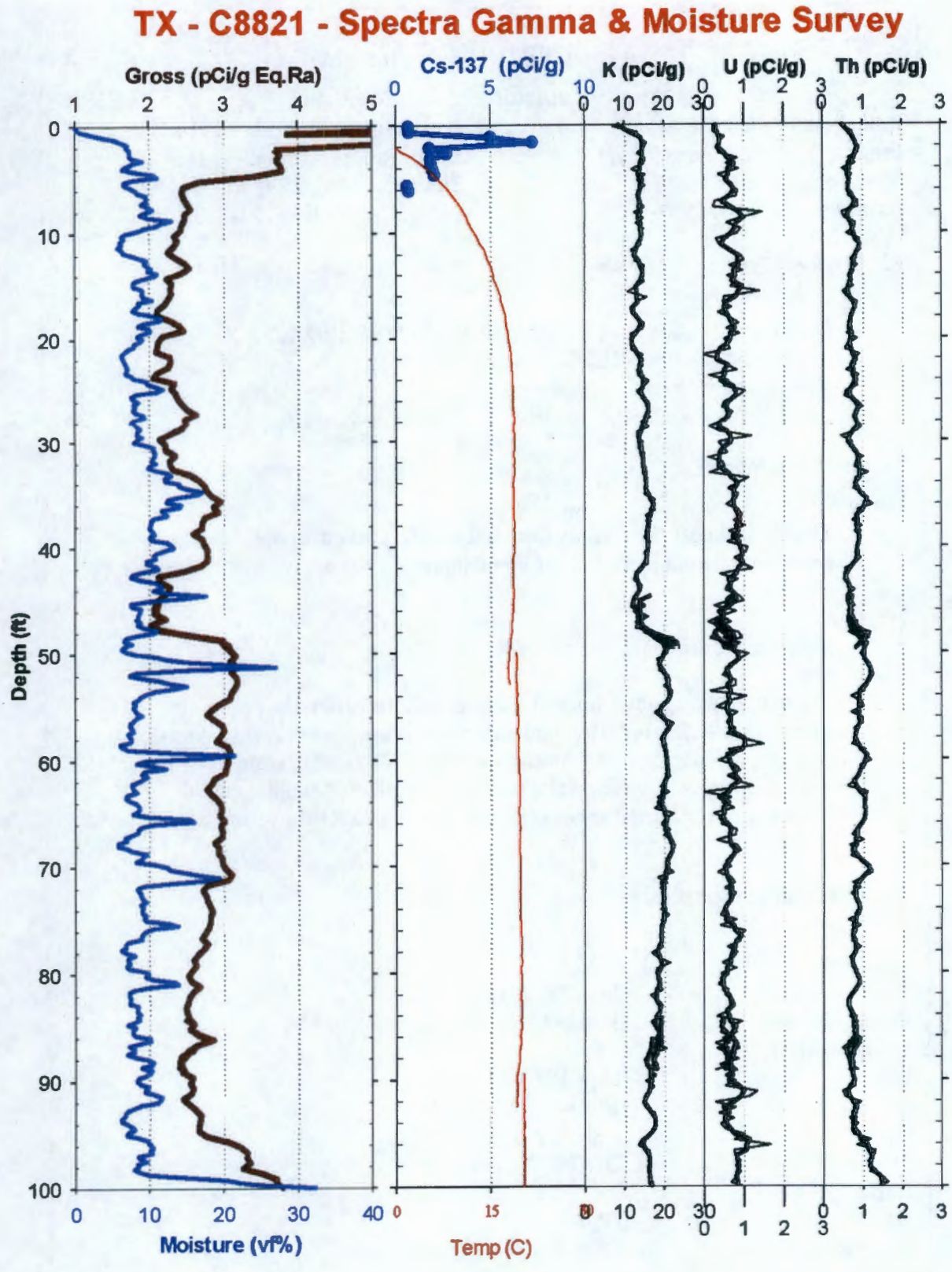
Moisture values range from 5-38%.

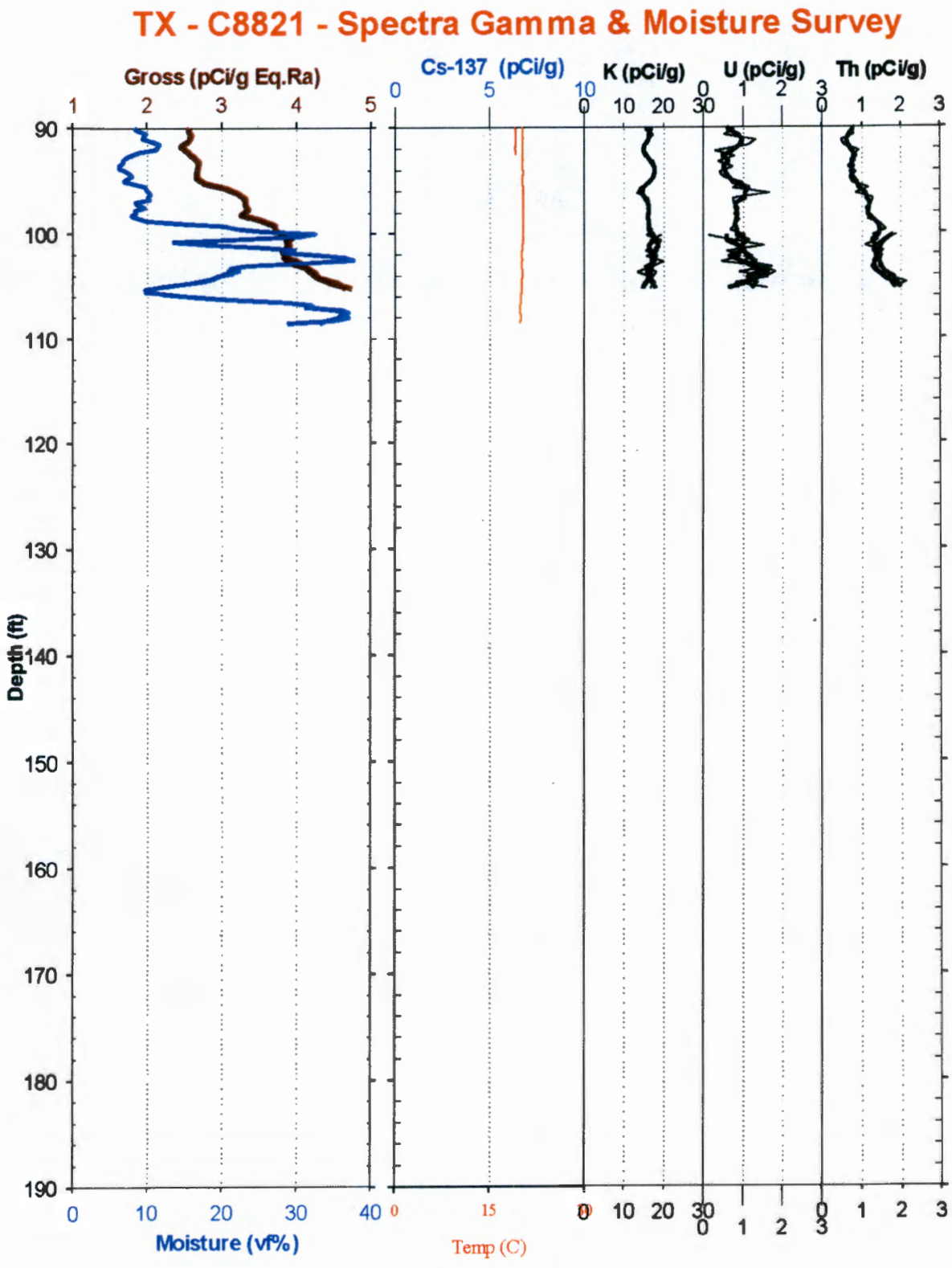
Temperature:

The temperature shows normal geologic gradient from the bottom to approximately 25 feet. The gradient over this deeper interval is very slowly changing temperature as a function of depth. The temperature from 25 feet to surface is due to environmental temperature effects from the outside temperature conducted in the steel casing from 2 feet above surface to 25 feet below.

45 Calibration Certificates

Moisture	
Date:	Sept 18, 2013
Electronic File:	Moist-2_2013-v1.zip
Gamma BGO	
Date:	Sept 18, 2013
Electronic File:	BGO-1_2013-v1.zip
Date:	Sept 4, 2013
Electronic File:	BGO-2_2013-v1.zip
LaBr	
Date:	Sept 4, 2013
Electronic File:	LaBr-2_2013-v1.zip


TX - C8821 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)


TX - C8821 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Depth (ft)
Moisture (vf%)
Temp (C)

APPENDIX E

INTERIM MEASURES INVESTIGATION SAMPLE CHAINS OF CUSTODY

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RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.6.D

Date Samples Received: 10.17.13 Group #: 20130989

Number of Samples: 1 set TX Farm Vadose C8300 I001

Sample Custodian: RHLuke

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	-1.0			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RHL Date 10.7.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-037	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8800 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13 00001	ACTUAL SAMPLE DEPTH: 53.5-55.5	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLP4	SOIL	A	10-7-13	0940	✓
B2PLP5	SOIL	B	10-7-13	0940	✓
B2PLP6	SOIL	C	10-7-13	0940	✓

Group # 20130989 ✓
Samples # S13V000639,
S13V000640,
S13V000641

Temp blank °C
-1.0
RTStark 10.7.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Brett Snook	DATE/TIME: 10-7-13 / 1035	RECEIVED BY/STORED IN: RTStark RTStark APL	DATE/TIME: 10.7.13 1035
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

CL 10-7-13

LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-038**	**PAGE 1 OF 1**
COLLECTOR Snock/ Villarreal	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8800 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 53.5 - 55.5	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing:

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PLP7	SOIL	10-7-13	0940'	✓

Shoe

Group # 20130989'
Samples # ~~S13V000639~~ 513V000642
RLLtar 10-7-13 ✓

Temp blank -1.0 °c
RLLtar 10.7.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME** ✓
Scott Snock / Scott Snock	10-7-13 / 1035	RtSheck ATL	10.7.13 1035
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest, pH is also run via quick turn analysis.

10-7-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.G.0

Date Samples Received: 10.8.13 Group #: 20130987

Number of Samples: 1 cut TX vadose C5800 I002

Sample Custodian: RHtech

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	8°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RH Date 10.8.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		V13-004-039	PAGE 1 OF 1
COLLECTOR: Snook / Catron	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03 / AIR QUALITY: ☐ / DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8800 1002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 71.5 - 73.5	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE / ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLP8	SOIL	A	10-8-13	1035	✓
B2PLP9	SOIL	B	10-8-13	1035	✓
B2PLR0	SOIL	C	10-8-13	1035	✓

Sample # S13V000680 ✓
681 ✓
682 ✓

Group # 20130989 ✓

Temp 0.8°C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Snook	DATE/TIME: 10-8-13 / 1105	RECEIVED BY/STORED IN: Todd McCulloch	DATE/TIME: 10/8/13 1110
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook 10-8-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		V13-004-040	PAGE 1 OF 1
COLLECTOR CATRON / SNOOK	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 / DATA TURNAROUND
SAMPLING LOCATION C8800 I002	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐ / 60 Days / 120 Days
ICE CHEST NO. 10-8-13 ~~TFVS 090~~ TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 71.5 - 73.5	COA N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE — ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A	

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	PRESERVATION	Cool-6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLR1	SOIL	10-8-13	1035	✓ Shoe

Sam # S13V000683
Group # 20130789
Temp 0.8°C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	10-8-13 / 1105	[signature] Todd McCulloch	10-8-13 1110
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook 10-8-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013 A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D. 6.0

Date Samples Received: 10.9.13 Group #: 2013 0989

Number of Samples: 1 Set TX FARM VA dose. @ 8800 I 007

Sample Custodian: RHtech

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	1°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? YES PC/SC Initials RH Date 10.9.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-041	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8800 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 98' - 100'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

GROUP # 20130989 ✓
Sample # S13V000702 ✓
S13V000703 ✓
S13V000704 ✓

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLR2	SOIL	A	10-9-13	1045 ✓	✓
B2PLR3	SOIL	B	10-9-13	1045 ✓	✓
B2PLR4	SOIL	C	10-9-13	1045 ✓	✓

Trip blank ~1°C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Sharp	DATE/TIME: 10-9-13 / 1115	RECEIVED BY/STORED IN: R Tech R Tech AR	DATE/TIME: 10-9-13 1115 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

10-9-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-042**	**PAGE** 1 **OF** 1
COLLECTOR Snook / Sharp	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8800 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 98' - 100'	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLR5	SOIL	10-9-13 ✓	1045	✓

Group # 20130989 ✓

Sample # S13V000705 ✓

Temp blank

~1 °C 10.9.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME** 10-9-13 / 1115	**RECEIVED BY/STORED IN**	**DATE/TIME** ✓ 10.9.13 1115
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

10-9-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.6.0

Date Samples Received: 9.5.13 Group #: ~~20130101~~ 20130986 9.5.13

Number of Samples: 1 set TX Farm vadose C8802 I001

Sample Custodian: [signature]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present				
Record cooler temperature in centigrade, as appropriate	0.6°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			Z B

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? yes PC/SC Initials [initials] Date 9.5.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-031	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8802 1001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 51'-53'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLN2	SOIL	A	9-5-13	0855	✓
B2PLN3	SOIL	B	9-5-13	0855	✓
B2PLN4	SOIL	C	9-5-13	0855	✓

GROUP # ~~20131010~~ 20130985
SAMPLE #
actual 9-5-13
~~S13V000659~~ A
~~S13V000660~~ B
~~S13V000661~~ C

Sample # S13V000579 A
S13V000580 B
S13V000581 C
S13V000582 shoe next page

temp blank - 0.6°C
actual

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Snook	DATE/TIME: 9-5-13 / 1030	RECEIVED BY/STORED IN: RJ Steel RJ Steel	DATE/TIME: 9.5.13 1030
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

9-5-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-032	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8802 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	
ICE CHEST NO.: TFV5-09-004	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: 51' - 53'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLN5	SOIL	9-5-13	0855	✓

RHTank 9.5.13
Group # 20130986
Sample # ~~20130015~~ ~~20130016~~ ~~513V000662~~ Shoe 513V000582
RHTank 9.5.13
Temp blank -0.6 °C

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Scott Snook / Vincent Chavez DATE/TIME: 9-5-13 1030	RECEIVED BY/STORED IN: RHTank RHTank 672 DATE/TIME: 9/5/13 1030	The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	

9-5-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.G. 0

Date Samples Received: 9.6.13 Group #: 20130986

Number of Samples: 1 set FX From VADOSE (C5802/IC02)

Sample Custodian: Pollock

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.8°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			Z B Z B Fridge Z B shelf 4

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? YES PC/SC Initials EFJ Date 9.6.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-033	PAGE 1 OF 1
COLLECTOR: SHARP / Willard	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8802 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09004	FIELD LOGBOOK NO.: TFVR-13-000001	ACTUAL SAMPLE DEPTH: 59'-61'	COA: MA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLN6	SOIL	9-6-13	0850	✓
B2PLN7	SOIL	9-6-13	0850	✓
B2PLN8	SOIL	9-6-13	0850	✓

GROUP # 20130981
SAMPLE # S13V000599
S13V000600
S13V000601

Trip blank ~0.8 ml pellet 9.6.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: [signature] Sharp/Willard	DATE/TIME: 9-6-13 0750	RECEIVED BY/STORED IN: RTSteele RTSteele 222	DATE/TIME: 9-6-13 0950
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

SAMPLE DELIVERED ON 9-5-13 @1020
PROCESSED ON 9-6-13 @0950
PSP 9-6-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-034	PAGE 1 OF 1
COLLECTOR SHotap / Villanewal	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8802 I002	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-000001	ACTUAL SAMPLE DEPTH 59'-61'	COA n/a	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. n/a		BILL OF LADING/AIR BILL NO. n/a		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	PRESERVATION	Cool-6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLN9	SOIL	9-6-13	0950	✓

Group # 20130981
Sample # S13V000602

Temp blank -0.8 °C
[signature] 9-6-13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
[signature] JLKillman	9-6-13 0950	[signature] RTStock AH	9-6-13 0950
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

SAMPLE DRIVEN ON 9-5-13 @ 1020
PROCESSED ON 9-6-13 @ 0945
[signature] 9-6-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 8/18/2013 A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev GG-0

Date Samples Received: 9-10-2013 C8802 Group #: 20131010 / 20130986

Number of Samples: ~~3~~ 1 set TX Farm Vadose I003 + 1 ~~field~~ Blank Equipment

Sample Custodian: RHTate mms 9/10/13

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete	✓			☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	4°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			2 B Fridge 2B Shelf 4

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RHT Date 9.10.13

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-035	PAGE 1 OF 1
COLLECTOR: Snook/Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8802 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 101'-103'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLP0	SOIL	A	9-10-13	0905	✓
B2PLP1	SOIL	B	9-10-13	0905	✓
B2PLP2	SOIL	C	9-10-13	0905	✓

GROUP # 20130986

SAMPLE # S13V000619 A
S13V000620 B
S13V000621 C

Temp blank 0.4 RHtech 9.10.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook/Scott Sharp	9-11-13/1035	RHTech RHTech 222S	9.10.13 1035 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

09-10-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**	**V13-004-036**	**PAGE 1 OF 1**

COLLECTOR Snook | Sharp	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8802 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 101'-103'	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PLP3	SOIL	9-10-13	0905	✓

group # 20130986

Sample # S13V000622 Shoe

Temp blank 0.4°C

RHteel 9.10.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Scott Snook | Scott Snook	**DATE/TIME** 9-10-13 | 1035	**RECEIVED BY/STORED IN** RHteel RHteel ATL	**DATE/TIME** 9.10.13 1035
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

09-10-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-003	PAGE 1 OF 2
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8802 Equipment Blank	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO.: V13-005	AIR QUALITY: ☐	
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 101' - 103'	COA: N/A	METHOD OF SHIPMENT: Govt. Vehicle	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	2	1
VOLUME	500mL	250mL	500mL	60mL	1000mL	1000mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; I129_SEP_GEA (TF);
B2PMT6 (WATER)	✓	✓	✓	✓	✓	✓

SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME: B2PMT6 | WATER | 9-10-13 | 0755

GRP: 20131010

Temp blank 0.4°C 9.10.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Sharp	DATE/TIME: 9-10-13 / 1035	RECEIVED BY/STORED IN: R Steele RJ Steele HT2	DATE/TIME: 9.10.13 1035
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS: SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

9-10-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-003	PAGE 2 OF 2
COLLECTOR Snook/Sharp	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8802 Equipment Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFV3-09-004	FIELD LOGBOOK NO. TFVZ-09-0 13-000001	ACTUAL SAMPLE DEPTH 101' - 103'	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev _____

Date Samples Received: 10-14-13 Group #: 20131011

Number of Samples: _____ 1 Set Tx Vadose Field Blank

Sample Custodian: Jason Frazier

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	-0.6°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g. refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? yes PC/SC Initials CEM Date 10/14/2013

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-004	PAGE 1 OF 2
COLLECTOR SHARP / CATRON	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐	**DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8804 Field Blank	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		**SAF NO.** V13-005		
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFV2-13-00001	**ACTUAL SAMPLE DEPTH** 77-79	**COA** N/A	**METHOD OF SHIPMENT** Govt. Vehicle	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	2	1
VOLUME	500mL	250mL	500mL	~~60mL~~ 125mL	1000mL	1000mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; I129_SEP_GEA (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B2PMT7	WATER	10-14-13	0908	✓	✓	✓	✓	✓	✓

Grp # 20131011

S13V000668
S13V000669
S13V000667
S13V000666
S13V000672
S13V000671

S13V000669 668 666 667 672 671 Temp: -0.6 °C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM Chris Catron	DATE/TIME 10-14-13 1405	RECEIVED BY/STORED IN Jason Fracke	DATE/TIME 10-14-13 1405	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS Scott Swoke 10-14-13
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	**RECEIVED BY**	**TITLE**		**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**		**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-004	PAGE 2 OF 2
COLLECTOR Sharp / Catron	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C8804 Field Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005		
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFV2-13-000001	ACTUAL SAMPLE DEPTH 77-79	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev _____

Date Samples Received: 10-14-13 Group #: 20130995

Number of Samples: 1 fct TX Vadose C8804

Sample Custodian: Jason Frazier

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	-0.6°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? yes PC/SC Initials CEM Date 10/14/2013

If No, comment on communication and resolution: CEM 10/14/13

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-043**	**PAGE 1 OF 1**
COLLECTOR Sharp /Catron	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8804 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFV2-13-000001	**ACTUAL SAMPLE DEPTH** 77-79	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group: 20130985 ✓

SAMPLE NO.	**MATRIX***		**SAMPLE DATE**	**SAMPLE TIME**		
B2PLR6	SOIL	A	10-14-13	1005 ✓	✓	S13V000320
B2PLR7	SOIL	B	10-14-13	1005 ✓	✓	S13V000321
B2PLR8	SOIL	C	10-14-13	1005 ✓	✓	S13V000322

Temp: -0.6°C

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Chris Catron	10-14-13 1405	Jason Frazier	10-14-13 1405
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Sword
10-14-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-044	PAGE 1 OF 1
COLLECTOR: SHARP / CATRON	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8804 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 77-79	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLR9	SOIL	10-14-13	1005	✓

Group: 20130985 ✓

Temp: -0.6°C

S13V000323

SHCC.

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Chris Catron	DATE/TIME: 10-14-13 1405	RECEIVED BY/STORED IN: Jason Frazier	DATE/TIME: 10-14-13 1405 ✓	The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	Brent Shook 10-14-13
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-045**	**PAGE** 1 **OF** 1
COLLECTOR Sharp/Catron	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8804 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFV2-13-000001	**ACTUAL SAMPLE DEPTH** 90-92	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group: 20130985

Temp: -0.6°C

SAMPLE NO.	**MATRIX***		**SAMPLE DATE**	**SAMPLE TIME**		
B2PLT0	SOIL	A	10-14-13	1330	✓	S13V000537
B2PLT1	SOIL	B	10-14-13	1330	✓	S13V000538
B2PLT2	SOIL	C	10-14-13	1330	✓	S13V000539

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Chris Catron	10-14-13 1405	Jason Frazier	10-14-13 1405
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott [illegible]
10-14-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-046	PAGE 1 OF 1
COLLECTOR: Sharp / CATRON	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8804 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 90-92	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLT3	SOIL	10-14-13	1330	✓

Group: 20130985

Temp: -0.6°C

S13V000540
Snare

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Chris Catron	DATE/TIME: 10-14-13 1405	RECEIVED BY/STORED IN: Josh Fuqua	DATE/TIME: 10-14-13 1405
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Swoe
10-14-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev D6-0

Date Samples Received: 10/15/13 Group #: 20130985

Number of Samples: 1 set of TX Barrier Samples C8904 I003

Sample Custodian: TM Colloch

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☐ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	✓			☐ Check if no cooler and/or no ice -0.6°C
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Y Initials [signature] Date 10/15/13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-047	PAGE 1 OF 1
COLLECTOR: Sharp/Crooks	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8804 1003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13 000001	ACTUAL SAMPLE DEPTH: 98'-100'	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

20130985 ✓
S13V000559 ✓
S13V000560 ✓
S13V000561 ✓
-0.6°C

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PLT4	SOIL	A	10-15-13	10:35	✓
B2PLT5	SOIL	B	10-15-13	10:35	✓
B2PLT6	SOIL	C	10-15-13	10:35	✓

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: [signature] DATE/TIME: 10-15-13 1105	RECEIVED BY/STORED IN: [signature] Eddie Colloch DATE/TIME: 10.15.13 1105	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:	

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

[signature]
10-15-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-048**	**PAGE** 1 **OF** 1
COLLECTOR Sharp/Goks	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8804 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 98 -100'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PLT7	SOIL	10-15-13	10:35	✓

20130985 ✓
S13V000562 ✓
.06°c

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
	10 15 13 11:05	TODD McCulloch	10/15/13
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

- The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

10-15-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6-6.a

Date Samples Received: 8.20.13 Group #: 20120815, 942
Number of Samples: (1) set TXUADOSE (C8806 ICOI) + 1 FB
Sample Custodian: [signature]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	*✓		*✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., ~~refrigeration~~)	✓			2 A Fridge

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials pfd Date 8.20.13
If No, comment on communication and resolution:

Other Comments:
* notes
* FB has preservatives on bottle and COC *✓
* samples do not ✓ ATLab

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-025	PAGE 1 OF 1
COLLECTOR: SNOOK / CATRON	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8806 I001 T	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFV5-09-004 TFV2 8-20-13	FIELD LOGBOOK NO.: TFV2-13-00001	ACTUAL SAMPLE DEPTH: 56-58	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKM2	SOIL	A	8-20-13	0855	✓
B2PKM3	SOIL	B	8-20-13	0855	✓
B2PKM4	SOIL	C	8-20-13	0855	✓

G2P# 20130815
Sample# S13V000420 A
S13V000421 B
S13V000422 C

Temp blank 0.2°C
8-20-13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
S. Snook / Scott Sund	8-20-13 / 1105	R Tuck R Tuck ATL	8-20-13 1105
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-20-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-026**	**PAGE** 1 **OF** 1
COLLECTOR SNOOK / CATRON	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **DATA TURNAROUND**
SAMPLING LOCATION C8806 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐ **60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 56-58	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKM5	SOIL	8-20-13	0855	✓

CRD# 20130815
SAMPLE# S13V000423 Shoe

temp blank °C
0.2 8.20.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook /	8-20-13/1105	RTStock ATL	8.20.13 1105
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-20-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-002	PAGE 1 OF 2
COLLECTOR Snook / Catron	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8806 Field Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. ~~IEV2-13-00000~~ IEV2-13-60	ACTUAL SAMPLE DEPTH 56-58	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS							
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
		HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
		TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
		NO. OF CONTAINER(S)	1	1	1	1	2	1
		VOLUME	500mL	250mL	500mL	60mL	1000mL	1000mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; I129_SEP_GEA (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B2PMT5	WATER	8-20-13	0910	✓	✓	✓	✓	✓	✓
			S13V000→	494	493	491	492	497	496

GRP# 20130942
~~201308~~
Temp blank 0.2 °C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	8-20-13/ 1105	RHFleck RHFleck ATL	8.20.13 1105
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

[signature] 8-20-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013 A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-002	PAGE 2 OF 2
COLLECTOR SNOOK / CATRON	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C8806 Field Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005		
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFV2-13-000001	ACTUAL SAMPLE DEPTH 56-58	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

8-20-13

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.60

Date Samples Received: 8.21.13 Group #: 20130815
Number of Samples: 1 set TX Farm Vadose (C8806/I002)
Sample Custodian: RHtad

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? YES Initials RHt Date 8.21.13
If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-027	PAGE 1 OF 1
COLLECTOR: Snook / Grohs	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8806 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 85'-87'	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKM6	SOIL	A	8-21-13	0855	✓
B2PKM7	SOIL	B	8-21-13	0855	✓
B2PKM8	SOIL	C	8-21-13	0855	✓

Group # 20130815

Sample # S13V000451 A
S13V000452 B
S13V000453 C

Temp blank ~0.2°C
RTStrick 8.21.13

CHAIN OF POSSESSION	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM: Scott Snook Scott Snook 8-21-13/0940 — DATE/TIME	RECEIVED BY/STORED IN: RTStrick RTStrick AR 8.21.13 0940 — DATE/TIME
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-21-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-028**	**PAGE** 1 **OF** 1
COLLECTOR Snook / Grohs	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8806 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TSVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 85'-87'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PKM9	SOIL	8-21-13	0855	✓

Group # 20130815

Sample # 513V000454 shoe

Temp blank -0.2 °C

8.21.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Scott Snook / Scott Snook	**DATE/TIME** 8-21-13 / 0940	**RECEIVED BY/STORED IN** RTSteele RTSteele ATL	**DATE/TIME** 8.21.13 0940
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-21-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev G6-0

Date Samples Received: 8-22-13 Group #: 20130815

Number of Samples: 1 Set TX Farm VADOSE C8806

Sample Custodian: T McCulloch

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☐ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	-0.4°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g. refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials TM Date 8/22/13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-029	PAGE 1 OF 1
COLLECTOR: Snook / Grohs	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8806 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS - 09-004	FIELD LOGBOOK NO.: TFVE-13-00001	ACTUAL SAMPLE DEPTH: 101'-103'	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKN0	SOIL	A	8-22-13	0805	✓
B2PLM9	SOIL	B	8-22-13	0805	✓
B2PLN0	SOIL	C	8-22-13	0805	✓

Group # 20130815
Sample # S13V000471 - A
S13V000472 - B
S13V000473 - C
Temp Blank - 0.4°C
8/22/13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook Scott Snook	8-22-13 / 0905	Todd McCollach Todd McCollach	8/22/13 0905
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-22-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-030**	**PAGE** 1 **OF** 1
COLLECTOR Snook/Grohs	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03
SAMPLING LOCATION C8806 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-03-000001	**ACTUAL SAMPLE DEPTH** 101'-103'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA	

DATA TURNAROUND
60 Days / 120 Days

ORIGINAL

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PLN1	SOIL	8.22.13	0805	✓

Group # 20130815
Sample # S13V000474- shoe
Temp Blank -0.4°C
8/22/13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Scott Snook / Scott Snook	**DATE/TIME** 8-22-13 / 0905	**RECEIVED BY/STORED IN** Todd McCulloch	**DATE/TIME** 8/22/13 0915
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-22-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev GG-0

Date Samples Received: 8/23/13 Group #: 20130778

Number of Samples: 1 SET TX Farm Vadose (C8808 I001)

Sample Custodian: _____

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☐ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	✓			☐ Check if no cooler and/or no ice 0.6°C
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials [signature] Date 8/23/13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-019**	**PAGE** 1 **OF** 1
COLLECTOR Sharp/Ullamcel	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐	**DATA TURNAROUND** **60 Days / 120 Days**
SAMPLING LOCATION C8808 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004		
ICE CHEST NO. TFVS-09-009	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 53'-55'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***		**SAMPLE DATE**	**SAMPLE TIME**	
B2PKL0	SOIL	A	8-23-13	10:51	✓
B2PKL1	SOIL	B	8-23-13	10:51	✓
B2PKL2	SOIL	C	8-23-13	10:51	✓

Group 20130778

Sample S13V000260 A
S13V000261 B
S13V000262 C

Temp Blank -0.6°C

8/23/13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM J. Ullamcel	**DATE/TIME** 8-23-13 12:51	**RECEIVED BY/STORED IN** Todd McCulloch	**DATE/TIME** 8/23/13 1251
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-23-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-020	PAGE 1 OF 1
COLLECTOR: Sharp/Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8808 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-C9-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 53'-55'	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKL3	SOIL	8/23/13	10:51	✓

Group 20130778
Sample S13V000263 shoE
Temp Blank - 0.6 °C
8/23/13

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: J.L. Villarreal — DATE/TIME: 8-23-13 12:51	RECEIVED BY/STORED IN: Todd McCulloch — DATE/TIME: 8/23/13 1251	The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	

RA 8-23-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.60

Date Samples Received: 8.26.13 Group #: 20130778

Number of Samples: 1 cf TX FARM VADOSE C8808 I002

Sample Custodian: Rhtab

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.8°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? YES Initials RA Date 8.26.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-021**	**PAGE 1 OF 1**
COLLECTOR Snook/Grooks	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐
SAMPLING LOCATION C8808 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**DATA TURNAROUND** 60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 84'-86'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKL4	SOIL	A	8·26·13	10:02	✓
B2PKL5	SOIL	B	8·26·13	10:02	✓
B2PKL6	SOIL	C	8·26·13	10:02	✓

Group # 20130778
Sample # 513V000280 A
513V000 281 B
513V000 282 C

Temp blank
0.8 °c
8.26.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	8-26-13 / 1040	RTSteele AR	8.26.13 1040
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-26-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-022**	**PAGE** 1 **OF** 1
COLLECTOR Snook / Grohs	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8808 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 84' - 86'	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing:

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PKL7	SOIL	8-26-13	10:02	✓

Group # 20130778

Sample # 513V000283

Temp Blank 0.8 °C

RHSteele 8-26-13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	8-26-13 / 1040	RHSteele RHSteele AH	8-26-13 1040
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-26-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.6.0

Date Samples Received: 8.27.13 Group #: 20130778
Number of Samples: 1 set TX Farm valve e8808 I003
Sample Custodian: [signature]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.5			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	~~✓~~		✓	[initials] 8.27.13
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			ZB Refridger ZB shelf 4

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials [initials] Date 8.27.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-023**	**PAGE** 1 **OF** 1
COLLECTOR Villarreal / Grohs	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8808 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 105-107	**COA** NA	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** NA		**BILL OF LADING/AIR BILL NO.** NA		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***		**SAMPLE DATE**	**SAMPLE TIME**	
B2PKL8	SOIL	A	8·27·13	0830	✓
B2PKL9	SOIL	B	8·27·13	0830	✓
B2PKM0	SOIL	C	8·27·13	0830	✓

Group # ~~S~~ 20130778
Sample # S13V000 300 A
S13V000 301 B
S13V000 302 C

Temp blank -0.5°C
8·27·13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Nathan Grohs /	**DATE/TIME** 8·27·13 1039	**RECEIVED BY/STORED IN** RTSfull	**DATE/TIME** 8·27·13 1039
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-27-13
Scott Snook 8-27-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013
A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-024	PAGE 1 OF 1
COLLECTOR Villarreal/Grohs	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8808 I003	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 105'-107'	COA NA	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	Cool~6C
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKM1	SOIL	8-27-13	0830	✓

Group # 20130778
Sample # S13V000303

temp blank -0.5 °C RHClark 8-27-13

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME
RELINQUISHED BY/REMOVED FROM Nathan Grohs / [signature]	8-27-13 1039	RECEIVED BY/STORED IN RHClark RHClark AH	8-27-13 1039
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

[signature] 8-27-13
Scott Sunh 8-27-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013 A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev G-G.0

Date Samples Received: 7.26.13 Group #: 20130784

Number of Samples: 1 set VADOSE TX FORM C8810 I 001

Sample Custodian: RHotek

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present		✓		
Record cooler temperature in centigrade, as appropriate	3°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			Z A

Notify the PM immediately if any problems are noted.

Samples acceptable for release? yes Initials RH Date 7.26.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-013	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8810 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 60-62	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKJ8	A	SOIL	7-26-13	0922 ✓	✓
B2PKJ9	B	SOIL	7-26-13	0922	✓
B2PKK0	C	SOIL	7-26-13	0922	✓

CRP# 20130184 ✓

Sample #
513V000390 A ✓
513V000391 B ✓
513V000392 C ✓

Temp blank ~3 °C
pH tech 7.26.13

CHAIN OF POSSESSION	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM: Scott Snook Scott Sharp DATE/TIME: 7-26-13 1100	RECEIVED BY/STORED IN: pH Tech pH Tech ATR DATE/TIME: 7-26-13 1100 ✓
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:
RELINQUISHED BY/REMOVED FROM: DATE/TIME:	RECEIVED BY/STORED IN: DATE/TIME:

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

7-26-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-014	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8810 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 60-62	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKK1	SOIL	7-26-13	~~0918~~ 0922	Y

GRPH 20130784 ✓
Sample# - S13V000343 ✓ Shoe

Temp blank 0°C → Rltsh 7.26.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook Scott Snook	DATE/TIME: 7-26-13 1100	RECEIVED BY/STORED IN: RtCheck RtSteele Rtz. 7.26.13	DATE/TIME: 1100 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

7-26-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev G.G.0

Date Samples Received: 7.29.13 Group #: 20130784
Number of Samples: 1 set (TX FARM VADOSE 1002)
Sample Custodian: RHtook

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	0.C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., ~~refrigeration~~)				2A Fridge

Notify the PM immediately if any problems are noted.

Samples acceptable for release? YES Initials RT Date 7.29.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-016**	**PAGE** 1 **OF** 1
COLLECTOR Snook / Sharp	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8810 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 87-89	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing:

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PKK5	SOIL	7-29-13	1135 ✓	✓

GROUP # 20130784 ✓

Sample # S130000 363 ✓ shoe

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Scott Snook	**DATE/TIME** 7-29-13 1400	**RECEIVED BY/STORED IN** RF Steele RFSteele AH	**DATE/TIME** ✓ 7-29-13 1400
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

7-29-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-015	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8810 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 87-89	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool–6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKK2	SOIL	7-29-13	1135 ✓	✓
B2PKK3	SOIL	7-29-13	1135 ✓	✓
B2PKK4	SOIL	7-29-13	1135 ✓	✓

GROUP # 20130784 ✓

SAMPLE # S13V000360 / A

~~S13V000362~~ ~~7.29.13~~ B S13V000361 ✓

~~S13V000363~~ C S13V000362 ✓

Temp 0.C pltbl 7.29.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Sharp	7-29-13 1400	RFStark RFStark 4Fr	7.29.13 1400 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

7-29-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.6.0

Date Samples Received: 7-31-13 Group #: 20130784

Number of Samples: 1 Set TX FARM VADOSE I003

Sample Custodian: RHTook

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	0°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			2A Fridge

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes RKT Initials RKT Date 7-31-13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-017	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION: C8810 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: 09-004 TFVS-~~04-009~~ SAS 7-31-13	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: 102' - 104'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

GRP # 20130784
SAMPLE # S13V000380 A
S13V000 391 B
S13V000 382 C
temp 0.2° C
elevated

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKK6	SOIL	A	7-31-13	0930	✓
B2PKK7	SOIL	B	7-31-13	0930	✓
B2PKK8	SOIL	C	7-31-13	0930	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook Scott Snook	7-31-13 1005	RT Eteck RT Eteck 4M	7.31.13 1405
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

7-31-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-018	PAGE 1 OF 1
COLLECTOR: Snook / Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8810 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 102' - 104'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKK9	SOIL	7-31-13	0930	✓

GRP # 20130784
Sample # S13V000383

Temp 0.2 C
pH Strip

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Brent Sharp	DATE/TIME: 7-31-13 1005	RECEIVED BY/STORED IN: at Stock Refstock Lab	DATE/TIME: 7-31-13 1005
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

7-31-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.6.0

Date Samples Received: 8.1.13 Group #: 20130756

Number of Samples: 1 Set TX FARM vadose

Sample Custodian: R Steele

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	1.2°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			2 A Fridge

Notify the PM immediately if any problems are noted.

Samples acceptable for release? yes Initials RST Date 8.1.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-007**	**PAGE 1 OF 1**
COLLECTOR Snook / Villarreal	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **DATA TURNAROUND**
SAMPLING LOCATION C8812 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐ **60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 54-56	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PKH6	SOIL A	8-1-13	1345	✓
B2PKH7	SOIL B	8-1-13	1345	✓
B2PKH8	SOIL C	8-1-13	1345	✓

Group # 20130756

Sample # S13V000173 A

S13V000174 B

S13V000175 C

Temp -1.2°c

RtSteele

8.1.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook Scott Snook	8-1-13 1420	RtSteele RTSteele ATL	8-1-13 1420
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-1-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-008	PAGE 1 OF 1
COLLECTOR: Snook/Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8812 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFUZ-13-00001	ACTUAL SAMPLE DEPTH: 54-56	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKH9	SOIL	8-1-13	1345	√

GROUP # ~~S13V000~~ plotted 2013756

SAMPLE # S13V000176

TEMP -1.2C

plotted 8.1.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	8-1-13 1420	RETech RTSteele 222	8-1-13 1420
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-1-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.6.0

Date Samples Received: 8.5.13 Group #: *20130756

Number of Samples: 1 Set TX radose I002 +1EQ Blank *20130757

Sample Custodian: _____

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0i°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g. refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials RH Date 8.5.13

If No, comment on communication and resolution:

Other Comments:

A-8005-342 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-005-001**	**PAGE 1 OF 2**
COLLECTOR Snook / Sharp	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8812 Equipment Blank	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		**SAF NO.** V13-005	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 70-72	**COA** N/A	**METHOD OF SHIPMENT** Govt. Vehicle **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	2	1
VOLUME	500mL	250mL	500mL	60mL	1000mL	1000mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; I129_SEP_GEA (TF);

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**						
B2PMT4	WATER	8-5-13	1015 ✓	✓	✓	✓	✓	✓	✓

GRP# 20130757 ✓

Temp blanks 0.2 °C
8.5.13

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	8-5-13 / 1305	RTSteele ATL	8.5.13 1305
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
8-5-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-001	PAGE 2 OF 2
COLLECTOR Snook / Sharp	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C8812 Equipment Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005		
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 70-72	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

Temp blank
0.2 °C
received
8.5.13

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-009	PAGE 1 OF 1
COLLECTOR: Snook/Sharp	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8812 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 70-72	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group # 20130756 ✓

Samples S13V000193 A
S13V000194 B
S13V000195 C

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKJ0	SOIL	A	8-5-13	1130 ✓	✓
B2PKJ1	SOIL	B	8-5-13	1130 ✓	✓
B2PKJ2	SOIL	C	8-5-13	1130	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Sharp	DATE/TIME: 8-5-13 1305	RECEIVED BY/STORED IN: Rebecca Rebecca ATL	DATE/TIME: 8.5.13 1305 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8.5.13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-010	PAGE 1 OF 1
COLLECTOR Smock / Sharp	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐	**DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8812 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004		
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-00000I	**ACTUAL SAMPLE DEPTH** 70-72	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	Cool~6C
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKJ3	SOIL	8-5-13	1130 ✓	✓

Group# 20130756 ✓
Sample# 513V000196 ✓

0.2 °C
Rtstark
8-5-13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Smock / Scott Smock	8-5-13 / 1305	RtStark RtStark 222	8-5-13 1305
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

9-5-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**	
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**	

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev GG-0

Date Samples Received: 8-7-2013 Group #: 20130756

Number of Samples: 1 set TX Fargo Loop

Sample Custodian: RT

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☒ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	1.2°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? Yes Initials RT Date 8-7-2013

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-011	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8812 1003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 103 - 105	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKJ4	SOIL	A	8-7-13	1015 ✓	✓
B2PKJ5	SOIL	B	8-7-13	1015 ✓	✓
B2PKJ6	SOIL	C	8-7-13	1015 ✓	✓

Group # 20130756 ✓
Sample # 513 U 000213 ✓ (Blank 713)
513 U 000214 ✓
513 U 000215 ✓

Temp Blank 1.2°C RTetal 8.7.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	8-7-13 / 1135	RTCtala RTStala AIR	8.7.13 1135
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-7-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-012	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8812 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 103 - 105	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKJ7	SOIL	8-7-13	1015 ✓	✓

Group 20130756 ✓
Sample S13V000216 ✓ shoe

Temp Blank 1.2 °C RTSteele 8.7.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Noah Arwood	8-7-13 / 1135	RTSteele SAF	8.7.13 1135 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-7-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev G.G 0

Date Samples Received: 8.9.13 Group #: 20130752

Number of Samples: 1 Set TX-Farm vadose C8814 I001

Sample Custodian: RHtaels

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			2 A

Notify the PM immediately if any problems are noted.

Samples acceptable for release? yes Initials RH Date 8.9.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-001	PAGE 1 OF 1
COLLECTOR: SHARP/Hubbard	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8814 1001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-00009	ACTUAL SAMPLE DEPTH: 56-57	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKF4	SOIL	A	8-9-13	0910	✓
B2PKF5	SOIL	B	8-9-13	0910	✓
B2PKF6	SOIL	C	8-9-13	0910	✓

GRP # 20130752
Sample # S13V00009 3
S13V00009 4
S13V00009 5

Temp 0.2 °C

RHTank 8.9.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: R.L. Sharp	DATE/TIME: 8-9-13 1110	RECEIVED BY/STORED IN: RHTank RHTank AIR	DATE/TIME: 8.9.13 1110
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-9-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-002**	**PAGE 1 OF 1**
COLLECTOR Sharp/Villarreal	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐	**DATA TURNAROUND** **60 Days / 120 Days**
SAMPLING LOCATION C8814 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004		
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 56'-58'	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2PKF7	SOIL	8-9-13	09:10	✓

Group # 20130752
Sample # S13V000096 ✓ Shoe

Temp 0.2°C
RHteele 8.9.13
0°

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM R.L.Sharp	**DATE/TIME** 8-9-13 1110	**RECEIVED BY/STORED IN** RHteele RHSteele AH2	**DATE/TIME** 8.9.13 1110
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8.9.13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev G.G.0

Date Samples Received: 8.12.13 Group #: 20130752

Number of Samples: 1 Set TX FARM VADOSE (C9814 I002)

Sample Custodian: RHeeb

Sample Custodian to Complete:				
Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.6°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			Z A
Notify the PM immediately if any problems are noted.				

Samples acceptable for release? Yes Initials RH Date 8.12.13

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-003	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8814 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 70-72	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2PKF8	SOIL	A	8-12-13	0930	✓
B2PKF9	SOIL	B	8-12-13	0930	✓
B2PKH0	SOIL	C	8-12-13	0930	✓

Group # 20130752
Sample # S13V000113
S13V000114
S13V000115

Temp blank .6°C attached

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Arcott Lucas	DATE/TIME: 8-12-13 / 1045	RECEIVED BY/STORED IN: RTech R15/416 AR	DATE/TIME: 8-12-13 1045
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

8-12-13

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-004**	**PAGE 1 OF 1**
COLLECTOR Snook / Villarreal	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐	**DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8814 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004		
ICE CHEST NO. TFVS-04-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 70-72	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKH1	SOIL	8-12-13	0930	✓

Group # 20130752
sample # S13V000116

Temp blank .6°C
actual

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	8-12-13 / 1045	RTC tech RTtech ATS	8-12-13 1045
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-12-13

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 6.6.0

Date Samples Received: 8.14.13 Group #: 20130752
Number of Samples: 1 Sulf TX Farm Valdosa (C8814 I0053)
Sample Custodian: Pat Steel

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PM for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.8°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PM immediately if any problems are noted.

Samples acceptable for release? yes Initials RTJ Date 8.14.13
If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		V13-004-005	PAGE 1 OF 1
COLLECTOR Snook / Groks	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 / DATA TURNAROUND
SAMPLING LOCATION C8814 I003	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐ / 60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 92'-94	COA NA	METHOD OF SHIPMENT GOVERNMENT VEHICLE / ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO. NA	

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKH2	SOIL A	8-14-13	0915	✓
B2PKH3	SOIL B	8-14-13	0915	✓
B2PKH4	SOIL C	8-14-13	0915	✓

Group # 20130752
Sample # S13V000133 A
S13V000134 B > c note * ettted
S13V000135 C

Temp blank -0.8 °C ettted 8-14-13

* liners B+C were stuck in Sampler and could not be removed. Soil from liners B+C was knocked out into a bowl + transferred to a 500ml glass bottle.

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME
RELINQUISHED BY/REMOVED FROM Scott Snook / Scott Snook	8-14-13 / 1040	RECEIVED BY/STORED IN RL Ettel RL Ettel	8-14-13 1040
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM		RECEIVED BY/STORED IN	

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

[signature] 8-14-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013 A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-006	PAGE 1 OF 1
COLLECTOR: Snook / Groks	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8814 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000002	ACTUAL SAMPLE DEPTH: 92'-94'	COA: NA	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: NA		BILL OF LADING/AIR BILL NO.: NA		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: **Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.**

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2PKH5	SOIL	8.14.13	0915	✓

Group # 20130752
Sample # S13V000136

Temp blk - 0.8°C
Plotted 8.14.13

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Snook	DATE/TIME: 8.14.13 / 1040	RECEIVED BY/STORED IN: R Hatch / R Hatch	DATE/TIME: 8.14.13 1040
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS: The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

8-14-13

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 6/18/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev 0G0

Date Samples Received: 2-10-14 Group #:

Number of Samples:

Sample Custodian:

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	-0.6			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials [illegible] Date 2-10-14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-097	PAGE 1 OF 1
COLLECTOR: Snook / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8816 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-006	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: 68-70'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group # 20140019

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6W3	A	SOIL	2-10-14	1110	✓
B2V6W4	B	SOIL	2-10-14	1110	✓
B2V6W5	C	SOIL	2-10-14	1110	✓

B2V6W3 – S1400000007
B2V6W4 – S1400000008
B2V6W5 – S1400000009
-0.6°C

SLH
2-10-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	2-10-14 / 1300	Sharon Lidder Shidder	2-10-14 / 1300
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

2/10/14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**	**V13-004-098**	**PAGE** 1 **OF** 1

COLLECTOR Snock / Shupe	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **DATA TURNAROUND**
SAMPLING LOCATION C8816 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐ **60 Days / 120 Days**
ICE CHEST NO. TFVS-09-006	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 68' - 70'	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V6W6	SOIL	2-10-14	1110	✓

Group # - 20140019

B2V6W6 - S14V000010
-0.6 °C

gLH
2-10-14

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snock / Scott Snock	2-10-14 / 1300	Sharon L Holden	2-10-14 1300
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

2/10/14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev DG-0

Date Samples Received: 2-11-14 Group #: ~~2-11-14~~ 2-11-14 20140019

Number of Samples:

Sample Custodian: Shan L Hall

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.6			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RLH Date 2-11-14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-100	PAGE 1 OF 1
COLLECTOR: Sneed / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8816 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-006	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: 74.5' - 76.5'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group # 20140019

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6W8	A	SOIL	2-11-14	1015 ✓	✓
B2V6W9	B	SOIL	2-11-14	1015 ✓	✓
B2V6X0	C	SOIL	2-11-14	1015 ✓	✓

B2V6X0 - SMU000029 - Liner B C
B2V6W8 - SMU000027 - Liner A
B2V6W9 - SMU000028 - Liner B
mms 2/11/14

Temp=0.6
ELH
2-11-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Sneed / Scott Sneed	DATE/TIME: 2-11-14/1300	RECEIVED BY/STORED IN: Sharon Udde / Sharon Udde	DATE/TIME: 2-11-14/1300 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

2/11/14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-101	PAGE 1 OF 1
COLLECTOR Snook / Shupe	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8816 I002	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-006	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 74.5-76.5	COA N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6X1	SOIL	2-11-14	1015 ✓	✓

Group # 20140019 ✓

B2V6X1 - S14U000030 ✓ - Shoe

Temp. - -0.6
[illegible] 2-11-16

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME ✓
Scott Snook [signature]	2-11-14/1300	[signature] Sharon L Wolker	2-11-14 1300
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

[signature] 2/11/14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013 A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev DG-0

Date Samples Received: 2-18-14 (4) TX C8816 I003 Group #: 20140019
Number of Samples: 4 IEQ 20140018-EQ.
Sample Custodian: [redacted]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.6			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials SLH2 Date 2-18-14

If No, comment on communication and resolution:

1 Equipment blank
1 set Vadose

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-005	PAGE 1 OF 2
COLLECTOR: Snook / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8816 Equipment Blank	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO.: V13-005	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: N/A	COA: N/A	METHOD OF SHIPMENT: Govt. Vehicle	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	2	1
VOLUME	500mL	250mL	500mL	60mL	1000mL	1000mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; 1129_SEP_GEA (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B2V7F5 ✓	WATER	2-18-14	1045 ✓	✓	✓	✓	✓	✓	✓

Grp # 20140018

~~B2V75~~ 2-18-14
B2V7F5

Temp -0.6
BLL 2-18-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME ✓	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
Scott Snook / Scott Shupe	2-18-14 / 1330	Ben L Hall Sharon L Bolden	2-18-14 1330	RST 2.18.14
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-005	PAGE 2 OF 2
COLLECTOR Smoot / Shupe	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C8816 Equipment Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005		
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH N/A	COA N/A	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

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A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-103	PAGE 1 OF 1
COLLECTOR: Snook/Shuck	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8816 1003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 105-107	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, Dt.=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6X3	A	SOIL	02-18-14 ✓	12:00 ✓	√
B2V6X4	B	SOIL	02-18-14 ✓	12:00 ✓	√
B2V6X5	C	SOIL	02-18-14 ✓	12:00 ✓	√

GWP # 20140019

B2V6X3 - S14V000046
B2V6X4 - S14V000047
B2V6X5 - S14V000048

Temp -0.6 RLL 2-18-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	2-18-14/1330	RL Wahl Shaw Wahl	2-18-14 1330 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook 2-18-14

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-104	PAGE 1 OF 1
COLLECTOR: Snook / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8816 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFV5-09-004	FIELD LOGBOOK NO.: TFV2-13-000001	ACTUAL SAMPLE DEPTH: 105-107	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

Carp# 20140019
B2V6X6 -314V000049 - Shoe

Temp -0.6
Shu 2-18-14

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6X6	SOIL	02-18-14	12:00	✓

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Swed — DATE/TIME: 2-18-14 1330	RECEIVED BY/STORED IN: Sharon Holdren Sharon Holdren — DATE/TIME: 2-18-14 1830 ✓	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME: 2-20-14	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	
RELINQUISHED BY/REMOVED FROM — DATE/TIME	RECEIVED BY/STORED IN — DATE/TIME	

SPECIAL INSTRUCTIONS: The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Swed 2-18-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev DB-5

Date Samples Received: 2-24-14 Group #: 20140020

Number of Samples: 2 Sets

Sample Custodian: [illegible]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete		✓		☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present				
Record cooler temperature in centigrade, as appropriate	+1.0			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle				
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials [illegible] Date 2-24-14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**	**V13-004-109**	**PAGE** 1 **OF** 1

COLLECTOR Snook / Shupe	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **DATA TURNAROUND**
SAMPLING LOCATION C8818 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐ 60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 59-61	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6Y3	A	SOIL	02-24-14	0945	✓
B2V6Y4	B	SOIL	02-24-14	0945	✓
B2V6Y5	C	SOIL	02-24-14	0945	✓

20140020

B2V6Y3 - ~~S14T000084~~ SW 2-24-14 S14V000084
B2V6Y4 - ~~S14T000085~~ SW 2-24-14 S14V000085
B2V6Y5 - ~~S14T000086~~ SW 2-24-14 S14V000086

Temp - 1.0
SW
2-24-14

CHAIN OF POSSESSION — **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	2-24-14/1330	Sharon [illegible]	2-24-14 1330

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook 2-24-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013 A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-110	PAGE 1 OF 1
COLLECTOR Snook / Shupe	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8818 I001	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFV2-13-000001	**ACTUAL SAMPLE DEPTH** 59-61	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6Y6	SOIL	02-24-14	0945	✓

20140020

B2V6Y6 - S14V0000 87 ~~S14T0000 87~~ SLH 2·24·14

Temp: -1.0
SLH
2·24·14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	2-24-14 / 1330	Sharon Uldden	2·24·14 13 30
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook 2-24-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-112	PAGE 1 OF 1
COLLECTOR Snook/Shupe	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8818 I002	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 67-69	COA N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

201400 20

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V6Y8	A	SOIL	02/24/14	1135	✓
B2V6Y9	B	SOIL	02/24/14	1135	✓
B2V700	C	SOIL	02/24/14	1135	✓

B2V678 - S14V000103
B2V679 - S14V000104
B2V700 - S14V000105

Temp: 4.0 @ 4
2-14-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook/Scott Snook	2-24-14 1330	Sharon Holbe/Sharon Holbe	224-14 1330
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook 2-24-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		V13-004-113	PAGE 1 OF 1
COLLECTOR: Snook/Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03 / AIR QUALITY: ☐ / DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8818 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 67-69	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE / ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing:

2014 0020

B2V701 - S14V000106

Temp = -1.0
BW
2-24-14

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V701	SOIL	02/24/14	1135	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook/Scott Shupe	DATE/TIME: 2-24-14 1330	RECEIVED BY/STORED IN: Sharon L Holder	DATE/TIME: 2-24-14 13 30
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS: The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook 2-24-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.G.0

Date Samples Received: 2.25.14 Group #: 20140020

Number of Samples: 1 Sat Tx Valore C8818-I003 20140025 (quick turn)

Sample Custodian: RTHook

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	1.4°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RTH Date 2.25.14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-115**	**PAGE 1 OF 1**
COLLECTOR Snook / Rivera	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8818 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 103-105	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO **222-S Lab Operations**	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V703 A	SOIL	2/25/14	1045	✓
B2V704 B	SOIL	2/25/14	1045	✓
B2V705 C	SOIL	2/25/14	1045	✓

Temp -1.4 °C pH [illegible] 2/25/14

GRP# 20140020

Sample# S14V000122 A ✓

S14V000123 B ✓

S14V000124 C ✓

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Scott Snook / Scott Snook	**DATE/TIME** 2-25-14 / 1300	**RECEIVED BY/STORED IN** RT Steele [illegible]	**DATE/TIME** ✓ 2-25-14 1300
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook

2-25-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-116	PAGE 1 OF 1
COLLECTOR: Snook / Rivera	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8818 I003	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 103-105	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V706	shoe	SOIL	2/25/14	1045	✓

Temp -1.4 °C pH'ed 2/26/14

GAP # 2014002 0
sample # S14V000125 shoe

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook / Scott Snook	DATE/TIME: 2-25-14/1300	RECEIVED BY/STORED IN: RT Steele RTSteele 4A	DATE/TIME: 2.25.14 1300
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook
2-25-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013 A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.6.0

Date Samples Received: 2-26.14 Group #: 20140022

Number of Samples: 1 Sat TX VADOSE 1 Sat TX VADOSE L6P820-I001 20140026 (Quick Turn)

Sample Custodian: RL Stahl

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0°			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? YES PC/SC Initials RLS Date 2-26-14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-121	PAGE 1 OF 1
COLLECTOR: Snook / Villarreal	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8820 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 53'-55'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V713	A	SOIL	2-26-14	1030	✓
B2V714	B	SOIL	2-26-14	1030	✓
B2V715	C	SOIL	2-26-14	1030	✓

Temp -0.6 °C
Peltab 2/26/14

6RP# 20140022 ✓

Sample # S14V000167 A ✓
168 B ✓
169 C ✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	2-26-14 / 1300	R F Sluck / R F Sluck AM	2.26.14 1300
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

2.26.14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-122	PAGE 1 OF 1
COLLECTOR Snook / Villarreal	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8820 I001	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 53' - 55'	COA N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V716	SOIL	2-26-14	1630 ✓	✓

Temp -0.6 °C RtClark 2/26/14

GEP # 20140022 ✓

Sample # S14V000170 ✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook Scott Snook	2-26-14 / 1300	RtClark R T Clark A12	2-26-14 1300 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

[signature] 2-26-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

E-102

9/16/2014 - 7:29 AM

RPP-RPT-57964, Rev. 0

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev 06.0

Date Samples Received: 2.27.14 Group #: 20140022 20140026 (Quick Turn)

Number of Samples: 1 set 1 set TX vadose (C8820-IOCR)

Sample Custodian: RH Stahl

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete	✓			☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	2°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC initials RH Date 2.27.14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-124	PAGE 1 OF 1
COLLECTOR Snook / Rivera	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8820 I002	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO. V13-004	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	FIELD LOGBOOK NO. TFVZ-13-000001	ACTUAL SAMPLE DEPTH 83'-85'	COA N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V718 A	SOIL	2-27-14	1125 ✓	✓
B2V719 B	SOIL	2-27-14	1125	✓
B2V720 C	SOIL	2-27-14	1125	✓

Temp blank 0.2 °c pHtuck 2-27-14

GRP# 20140022 ✓
Sample # S14V000186 ✓ A
187 ✓ B
188 ✓ C

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook Scott Snook	2-27-14 / 1315	pHtuck RTSH#6 ATZ	2-27-14 1315
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

[signature]

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-125	PAGE 1 OF 1
COLLECTOR: Snook / Rivera	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8820 I002	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-000001	ACTUAL SAMPLE DEPTH: 83'-85'	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V721	SOIL	2-27-14	1125	✓

Temp blank 0.2 °C RHCtech 2-27-14

Group # 2014002Z

Sample # S14V000189 ✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Scott Snook Accott Snook	DATE/TIME: 2-27-14 / 1315	RECEIVED BY/STORED IN: RHCtech RHCtech AM	DATE/TIME: 2-27-14 1325 1315
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS: The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

RHCtech 2-27-14

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D.G.O

Date Samples Received: 3.3.14 Group #: 20140022
20140026 (Quick Turn)
Number of Samples: 1 Set TX FARM + (1) FB 20140021 Field Blank
Sample Custodian: [redacted]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete	✓			☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? YES PC/SC Initials R H Date 3-3-14

If No, comment on communication and resolution:

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-127	PAGE 1 OF 1
COLLECTOR Campbell / Snook	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8820 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TFV2-13-2004 09 (DC 3-3-14)	**FIELD LOGBOOK NO.** TFV2-13-000001	**ACTUAL SAMPLE DEPTH** 100 - 102	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Temp blank 0.2 °C 3-3-14 rlstod

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V723	A	SOIL	3-3-14	1120 ✓	✓
B2V724	B	SOIL	3-3-14	1120 ✓	✓
B2V725	C	SOIL	3-3-14	1120 ✓	✓

GROUP 20140022 ✓
S14V000205 ✓
S14V000206 ✓
S14V000207 ✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	3-3-14 1330	RECEIVED 3-3-14 ATL	1330 ✓

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Snook 3-3-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**		**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-128**	**PAGE 1 OF 1**
COLLECTOR Campbell / Snook	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION CB820 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-00006 1	**ACTUAL SAMPLE DEPTH** 100-102	**COA** n/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** n/A		**BILL OF LADING/AIR BILL NO.** n/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V726	SOIL	3-3-14	1120 ✓	✓

GROUP 20140022 ✓
514V000208 ✓

Temp blank
0.2 °C
3-3-14
RHTech

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Scott Snook / Scott Snook	3-3-14/1550	RHTech RHTech ATL	3-3-14 1550
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook
3-3-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-006	PAGE 1 OF 2
COLLECTOR: Campbell / Snook	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8820 Field Blank	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO.: V13-005	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVZ-13-00001	ACTUAL SAMPLE DEPTH: n/A	COA: n/A	METHOD OF SHIPMENT: Govt. Vehicle	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: n/A		BILL OF LADING/AIR BILL NO.		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	28 Days	7 Days	28 Days/48 Hours	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	2	1
VOLUME	500mL	250mL	500mL	60mL	1000mL	1000mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	300.7_AMMONIUM (TF);	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - TRITIUM; I129_SEP_GEA (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B2V7F6 ✓	WATER	3-3-14	1005 ✓	✓	✓	✓	✓	✓	✓

Temp oc 0.2 RLtbl 3-3-14

Group # 20140021 ✓
Sample #s 514V000160 → 166

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Scott Snook Scott Snook	DATE/TIME: 3-3-14 / 1330	RECEIVED BY/STORED IN: RT Fecht RT Fecht ATC	DATE/TIME: 3.3.14 1330 ✓	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	Scott Snook 3-3-14
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-005-006	PAGE 2 OF 2
COLLECTOR Campbell / Snook	COMPANY CONTACT TABOR, CL	TELEPHONE NO. 373-3981	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C8820 Field Blank	PROJECT DESIGNATION Direct Push Samples for TX Tank Farm - Interim Barrier - QC Sample		SAF NO. V13-005		
ICE CHEST NO. TFVS - 09-004	FIELD LOGBOOK NO. TFV2-13-000001	ACTUAL SAMPLE DEPTH n/a	COA n/a	METHOD OF SHIPMENT Govt. Vehicle	ORIGINAL
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. n/a		BILL OF LADING/AIR BILL NO.		

SPECIAL INSTRUCTIONS

(1) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium}; RADISO_ICPMS (TF) {Neptunium-237, Technetium-99, Thorium-230, Thorium-232, Tin-126, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238};
(2) IC Anions - 9056 {2-Hydroxyacetate, Acetate, Bromide, Chloride, Fluoride, Formate, Nitrate, Nitrite, Oxalate, Phosphate, Sulfate};
(3) GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr;

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev 060

Date Samples Received: 3.4.14 Group #: 20140023

Number of Samples: 1 set

Sample Custodian: [illegible] LMale

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☐ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.8			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle				
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials [illegible] Date 3.4.14

If No, comment on communication and resolution:

1 Set Vadose

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-133	PAGE 1 OF 1
COLLECTOR: Campbell / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8822 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVS-13-000001	ACTUAL SAMPLE DEPTH: 50-52	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group # 20140023 ✓

B2V733 - S14V000243 ✓
B2V734 - S14V000244 ✓
B2V735 - S14V000245 ✓

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2V733 ✓	SOIL	A	3-4-14	1206	✓
B2V734 ✓	SOIL	B	3-4-14	1206	✓
B2V735 ✓	SOIL	C	3-4-14	1206	✓

Temp 0.8
DM
3-4-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: B Campbell	DATE/TIME: 3-4-14 1340	RECEIVED BY/STORED IN: Sharon L Holden	DATE/TIME: 3-4-14 1346 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-134	PAGE 1 OF 1
COLLECTOR: Campbell / Shupe	COMPANY CONTACT: TABOR, CL	TELEPHONE NO.: 373-3981	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8822 I001	PROJECT DESIGNATION: Direct Push Samples for TX Tank Farm - Interim Barrier		SAF NO.: V13-004	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-004	FIELD LOGBOOK NO.: TFVS-13-00001	ACTUAL SAMPLE DEPTH: 50-52	COA: n/a	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: n/a		BILL OF LADING/AIR BILL NO.: n/a		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	G
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

Group # 20140023 ✓

B2V736 - S14U000246 ✓

Temp 0.8

BLH

3-4-14

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V736 ✓	SOIL	3-4-14	1206 ✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: BCampbell	DATE/TIME: 3-4-14 1340	RECEIVED BY/STORED IN: Sharon Holdren	DATE/TIME: 3-4-14 1340 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS: The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev D6-0

Date Samples Received: 3·5·14 Group #: 20140023
Number of Samples: 1 sat
Sample Custodian: Shan C Mallo

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☐ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RHL Date 3·5·14
If No, comment on communication and resolution:

1 sat Oadose

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-136**	**PAGE** 1 **OF** 1
COLLECTOR Campbell / snook	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8822 I002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 59 - 61	**COA** n/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** n/A		**BILL OF LADING/AIR BILL NO.** n/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V738 A	SOIL	3-5-14	1000 ✓	✓
B2V739 B	SOIL	3-5-14	1000 ✓	✓
B2V740 C	SOIL	3-5-14	1000 ✓	✓

Group # 20140023 ✓

B2V738 - S14V000262 ✓
B2V739 - S14V000263 ✓
B2V740 - S14V000264 ✓

Temp 0.2
SLU 3-5-14

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME** ✓
Scott Snook	3-5-14/1300	Sharon Uholen	3-5-14 1300
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Jill DShupe
3-5-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-137	PAGE 1 OF 1
COLLECTOR Campbell / Snook	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8822 1002	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-00001	**ACTUAL SAMPLE DEPTH** 59-61	**COA** n/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** n/A		**BILL OF LADING/AIR BILL NO.** n/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	Cool~6C
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V741	SOIL	3-5-14	1000 ✓	✓

Group # 20140023 ✓

B2V741 - S14V000265 ✓
Temp 0.2
BLR 3-5-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Scott Snook / Scott Snook	3-5-14 1300	Sharon Holder Sharon Holder	3-5-14 1300 ✓
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Jill D Shurr 3-5-14
3-5-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**		**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**		**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev DO-0

Date Samples Received: 3-7-14 Group #: 20140023

Number of Samples: 1 Set 20140027 (Quick Form)

Sample Custodian: [signature]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☐ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.2			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials RLH Date 3-7-14

If No, comment on communication and resolution:

1 set vadose

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V13-004-139	PAGE 1 OF 1
COLLECTOR Campbell / Rivera	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8822 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	60 Days / 120 Days
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 101-103	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	160g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Group # 20140023

SAMPLE NO.	MATRIX*		SAMPLE DATE	SAMPLE TIME	
B2V743	SOIL	A	3-7-14	1030	✓
B2V744	SOIL	B	3-7-14	1030	✓
B2V745	SOIL	C	3-7-14	1030	✓

B2V743 – S14V000281
B2V744 – S14V000282.
B2V745 – S14V000283
5 cm asbestos
Temp Blank: 0.2
BLM 3-7-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
B Campbell B Campbell	3-7-14 1251	Sharon Milder Sharon Milder	3-7-14 1251

SPECIAL INSTRUCTIONS
The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

LABORATORY SECTION	**RECEIVED BY**		**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-140**	**PAGE 1 OF 1**
COLLECTOR Campbell / Rivera	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8822 I003	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFV~~3~~Z-09-004 3-7-14	**FIELD LOGBOOK NO.** TFVZ-13-000001	**ACTUAL SAMPLE DEPTH** 101 - 103	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V746	SOIL	3-7-14	1030	✓

Group # ~~20140220~~ cm 3/7/14
20140023

B2V746-S14U000284

Temp Blank; 0.2
SLU 3-7-14

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
B Cahill B Campbell	3-7-14 1251	Sharon L Udden	3-7-14 1251
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

RPP-RPT-57964, Rev. 0

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	ATS-LO-090-101 Rev 06.0

Date Samples Received: 3.10.14 Group #: 20141023

Number of Samples: 1 set

Sample Custodian: [signature]

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☑ In Project File
Received from an alpha facility?		✓		☐ Contact PC for approval to release
Check that outer custody seal is intact, if present	✓			
Record cooler temperature in centigrade, as appropriate	0.4			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
Verify that COC or RSA is accurate and complete, containing the following information:				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) are noted on the COC/RSA and sample bottle	✓			
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? Yes PC/SC Initials SLM Date 3.10.14

If No, comment on communication and resolution:

1 set Vadose

Other Comments:

A-6005-302 (REV 3)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**		**V13-004-142**	**PAGE 1 OF 1**
COLLECTOR Snook / Campbell	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03 **AIR QUALITY** ☐ **DATA TURNAROUND** 60 Days / 120 Days
SAMPLING LOCATION C8822 I004	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFV2-000001	**ACTUAL SAMPLE DEPTH** 107-109	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE **ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A	

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	160g
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.		MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2V748	A	SOIL	3-10-14	10:45	✓
B2V749	B	SOIL	3-10-14	10:45	✓
B2V750	C	SOIL	3-10-14	10:45	✓

Group 20140023

B2V748 - S14U000300
B2V749 - S14U000301
B2V750 - S14V000302
Temp Blank - 0.4
RM 3-10-14

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
Jill D Shupe / Jill D Shupe	03-10-14 12:58	Sharon Moller / Sharon Moller	3-10-14 1258
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Scott Arndt
3-10-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

Washington River Protection Solutions	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**			**V13-004-143**	**PAGE** 1 **OF** 1
COLLECTOR Snook / Campbell	**COMPANY CONTACT** TABOR, CL	**TELEPHONE NO.** 373-3981	**PROJECT COORDINATOR** SYDNOR, HA	**PRICE CODE** C03	**DATA TURNAROUND**
SAMPLING LOCATION C8822 I004	**PROJECT DESIGNATION** Direct Push Samples for TX Tank Farm - Interim Barrier		**SAF NO.** V13-004	**AIR QUALITY** ☐	**60 Days / 120 Days**
ICE CHEST NO. TFVS-09-004	**FIELD LOGBOOK NO.** TFVZ-000001	**ACTUAL SAMPLE DEPTH** 107-109	**COA** N/A	**METHOD OF SHIPMENT** GOVERNMENT VEHICLE	**ORIGINAL**
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	**POSSIBLE SAMPLE HAZARDS/ REMARKS** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	**PRESERVATION**	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	G
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	**SAMPLE ANALYSIS**	Generic Testing;

SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**	
B2V751	SOIL	3-10-14	10:45	✓

Group 20140023

B2V751 - S14U000303

Temp Blank - 0.4

SM 3-10-14

CHAIN OF POSSESSION		**SIGN/ PRINT NAMES**	
RELINQUISHED BY/REMOVED FROM Jill D Shupe / Jill D Shupe	**DATE/TIME** 3-10-14 12:58	**RECEIVED BY/STORED IN** / Sharon L Udde	**DATE/TIME** 3-10-14 1258
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

The laboratory will determine bulk density for each liner, then the material from the liners and shoe (500 ml glass jar assigned to generic testing) shall be composited and analyzed for the composite analyses. A Quick-turn sample will be analyzed for nitrate, Tc-99 and conductivity on a 1:1 water digest. pH is also run via quick turn analysis.

Scott Snook
3-10-14

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 12/11/2013

A-6003-618 (REV 2)

APPENDIX F

INTERIM MEASURES INVESTIGATION DEEP ELECTRODE PLACEMENT

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APPENDIX F
INTERIM MEASURES INVESTIGATION DEEP ELECTRODE PLACEMENT

TX Farm Direct Push - Depth of Electrodes

Direct Push Location Name	Depth of Electrode (feet below ground surface)			
C8799	40-42	60-62	80-82	99-101
C8801	59-61			101-103
C8803			78-80	99-101
C8805	44-46	64-66	84-86	103.25-105.25
C8807	43-45	63-64	83-85	102.5-104.5
C8809			60-62	103-105
C8811	49.5-51.5	69.5-71.5	89.5-91.5	109-111
C8813	56-58			92-94
C8815		74.5-76.5		105-107
C8817	59-61			103-105
C8819		61.2-63.2	81.2-83.2	100.25-102.25
C8821		60-62	80-82	100.25-102.25

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APPENDIX G

INTERIM MEASURES INVESTIGATION DECOMMISSIONING DATES

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APPENDIX G
INTERIM MEASURES INVESTIGATION DECOMMISSIONING DATES

From: Michael Ehrgott [mailto:MJEHRGOTT@energysolutions.com]
Sent: Tuesday, September 17, 2013 7:36 AM
To: Sydnor, Harold A; Walkup, Mike W; Ehrgott, Mike J
Cc: Gardner, Martin G (Marty); Tabor, Cynthia L; Shrum, Ann; Aquila F. Hoopes; Nardinger, Annette (ES); Withrow, Steven M; Eberlein, Susan J; Shanda Icayan; McKinney, Steve G; Parker, Dan L (Danny); Skoglie, David E; Berlin, Penelope (Energy Solutions); Franzen, Rick (Sr); Steffler, Rory; Wiegman, Rebecca S; Reynolds, Kent D; Hutchings, Kristopher; Throolin, Jacob W; Michael A. Weakley; Amos, Olin
Subject: Daily Activity for "TX" Farm Barrier Characterization

TX-Farm Barrier Characterization

ACTIVITIES COMPLETED ON MONDAY SEPTEMBER 16th, 2013

C8805- Back-pulled 2.5" and decommission from 107.0'BGS to GS and install multilevel probe. During decommissioning set center of probes at 104.25', 85.0', 65.0', and 45.0'BGS.

C8805A-Decommissioned from 11.0'BGS to GS with Bentonite. The top 8.0' of 2.5" was removed. (2.5"drill string abandoned in place from 111.3' to 8.0'BGS (103.3') with bentonite).

C8799-Moved rig #4 and support equipment to C8799 set up and drove 2.5" drill string from GS to 59.0'BGS

ANTICIPATED UPCOMING WORK

C8799-Continue driving 2.5" drill string from 59.0' BGS.

PROGRESS SUMMARY

EXPLORATORY BORINGS

C8799- Drove 2.5" drill string from GS to 59.0'BGS. (performed on 9-16-13)

C8801---Pushed from GS to refusal at 108.5' BGS. (Push activities completed on 08-16-13)
Moisture logging has been completed from 108.0'BGS to GS. (Moisture logging completed on 08-19-13)
Gamma logging has been completed from 108.0' BGS to GS. (Gamma logging completed on 08-23-13)
During Decommissioning...Set center of 1st single point resistivity Probe @ 102.0'BGS.(Performed on 09-11-13)
During Decommissioning...Set center of 2nd single point resistivity Probe @ 60.0'BGS.(Performed on 09-12-13)
Decommissioned C8801 from 108.5'BGS to GS (Completed on 09-12-13)

C8813---Pushed from GS to refusal at 107.9' BGS. (Push activities completed on 07-10-13)

Gamma logging has been completed from 106.5' BGS to GS. (Gamma logging completed on 07-12-13)
Moisture logging has been completed from 106.5' BGS to GS. (Moisture logging completed on 07-15-13)
During Decommissioning...Set center of 1st Resistivity Probe @ 93.0'BGS.(Performed on 08-17-13)
During Decommissioning...Set center of 2nd Resistivity Probe @ 57.0'BGS (Performed on 08-18-13)
Decommissioned C8813 from 107.9.0'BGS to GS (Completed on 08-18-13)

C8811---Pushed from GS to refusal at 113.3' BGS. (Push activities completed on 06-14-13)
Gamma logging has been completed from 112.7' BGS to GS. (Gamma logging completed on 06-20-13)
Moisture logging has been completed from 112.7' BGS to GS. (Moisture logging completed on 06-26-13)
Decommission from 113.3' to 111.0'BGS Knockout tip ready for multi level probe installation.(Performed 08-19-13)
During Decommissioning...Set center of 1st resistivity Probe @ 109.75'BGS.(Performed on 08-28-13)
During Decommissioning...Set center of 2nd resistivity Probe @ 90.5'BGS.(performed on 8-28-13)
During Decommissioning...Set center of 3rd resistivity Probe @ 70.5'BGS.(Performed on 08-28-13)
During Decommissioning...Set center of 4th resistivity Probe @ 50.5'BGS.(Performed on 8-28-13)
Decommissioned C8811 from 113.3'BGS to GS (Completed on 08-29-13)

C8809---Pushed from GS to refusal at 111.3' BGS. (Push activities completed on 06-18-13)
Gamma logging has been completed from 110.5' BGS to GS. (Gamma logging completed on 06-24-13)
Moisture logging has been completed from 110.5' BGS to GS. (Moisture logging completed on 06-26-13)
During Decommissioning...Set center of 1st resistivity Probe @ 104.0'BGS.(Performed on 08-30-13)
During Decommissioning...Set center of 2nd resistivity Probe @ 61.0'BGS. (performed on 08-30-13)
Decommissioned C8809 from 111.3'BGS to GS (Completed on 09-04-13)

C8807A---Pushed from GS to refusal at 66.7' BGS. (Push activities completed on 07-10-13)
Drill string was broken/parted at 16.0' BGS. 2.5" Drill string from 66.7' BGS to 16.0' BGS was abandoned in place with bentonite and remaining 2.5" drill string was back-pulled from 16.0' BGS to GS and decommissioned with bentonite. **Decommissioned (Completed on 07-24-13)**

C8807---Pushed from GS to refusal at 111.5' BGS. (push activities completed on 07-23-13)
Gamma logging has been completed from 110.5' BGS to GS. (Gamma logging was completed on 08-05-13)
Moisture logging has been completed from 110.5'BGS to GS. (Moisture logging completed on 08-07-13)
During Decommissioning...Set center of 1st resistivity Probe @ 103.25'BGS.(Performed on 09-09-13)
During Decommissioning...Set center of 2nd resistivity Probe @ 84.0'BGS.(performed on 9-09-13)
During Decommissioning...Set center of 3rd resistivity Probe @ 64.0'BGS.(Performed on 09-09-13)
During Decommissioning...Set center of 4th resistivity Probe @ 44.0'BGS.(Performed on 09-11-13)
Decommissioned C8807 from 111.5'BGS to GS. (Completed on 09-11-13)

C8805B---Pushed from GS to refusal at 64.3' BGS. Push activities completed on 07-11-13)Boring was decommissioned with bentonite from 29.6' BGS to GS. Drill string from 64.3' BGS to 32.0' BGS was abandoned in place with 6' of knocker bar and ~65.0' of knocker bar cable.
Decommissioned (completed on 07-17-13)

C8805A---Pushed from GS to refusal at 111.3' BGS. (Push activities completed on 07-16-13)
Moisture logging has been completed from 108.5' BGS to GS. (Moisture logging completed on 07-29-13)

Gamma logging has been completed from 108.5' BGS to GS. (Gamma logging completed on 07-31-13)
C8805 (A) Two attempts were made with fishing tool extractor to retrieve 2.5" drill string below 8.0'BGS (broken joint)...which were ***not*** successful (Completed on 9-12-13). WRPS and ES management along with WDOE were notified. The path forward will be to decommission and abandoned 2.5" drill string 111.3'BGS to 8.0'BGS in place with Bentonite and remove the 2.5" drill sting 8.0'BGS to GS. This abandoned hole will be Identified as C8805A. Per WRPS management we will step out ~2.0' to Southwest from C8805A and drive a new C8805 probe hole to Below probe depth of 105.0'BGS. (Rig #2).
Decommissioned C8805A from 111.3'BGS to GS with Bentonite (2.5"drill string abandoned in place (103.5')(Completed on 9-16-13)

C8805---Pushed from GS to 108.0'BGS. Back-pulled from 108.0' to 107.0'BGS and knock-out expendable tip. (Performed on 9-13-13)
C8805- Back-pulled 2.5" and decommission from 107.0'BGS to GS and install multilevel probe. (performed on 9-16-13)
During Decommissioning...Set center of 1st resistivity Probe @ 104.25'BGS.(Performed on 09-16-13)
During Decommissioning...Set center of 2nd resistivity Probe @ 85.0'BGS.(performed on 9-16-13)
During Decommissioning...Set center of 3rd resistivity Probe @ 65.0'BGS.(Performed on 09-16-13)
During Decommissioning...Set center of 4th resistivity Probe @ 45.0'BGS.(Performed on 09-16-13)
Decommissioned C8805 from 108.0'BGS to GS. (Completed on 09-16-13)

SAMPLE BORINGS

C8802---Pushed from 65.0'BGS to 101.0'BGS. (Push activities performed on 09-09-13)
1st sample recovery from 51.0' BGS to 53.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
2nd sampler was driven but not recovered yet. (Performed on 09-05-13)
At 08:43 recover and process second sample on 09-06-13 (interval 59.0' to 61.0'BGS) that was driven at 10:20 on 09-05-13.
2nd sample recovery from 59.0' BGS to 61.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
3rd sample recovery from 101.0' BGS to 103.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%. (QC Equipment blank)
C8802---Decommissioned from 103.0 ' BGS to GS on 09/10/2013.

C8808---Pushed from GS to 105.0'BGS. (Push activities performed on 8-26-13)
1st sample recovery from 53.0' BGS to 55.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
2nd sample recovery from 84.0' BGS to 86.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
3rd sample recovery from 105.0' BGS to 107.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
C8808---Decommissioned from 107.0 ' BGS to GS on 8/27/2013.

C8806--- Drove2 5/8 DWSS from GS to 56.0'BGS first sample interval. (performed on 08-19-13)
1st sample recovery from 56.0' BGS to 58.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%. (QC Field Blank)
2nd sample recovery from 85.0' BGS to 87.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%,

Liner "C"=100%.
3rd sample recovery from 101.0' BGS to 103.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
C8806---Decommissioned from 103.0 ' BGS to GS on 8/22/2013.

C8810---Pushed from GS to 104.0' BGS. (Push activities completed on 07-30-13)
1st sample recovery from 60.0' BGS to 62.0' BGS: Shoe=95.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
2nd sample recovery from 87.0' BGS to 89.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
3rd sample recovery from 102.0' BGS to 104.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
C8810---Decommissioned from 104.0 ' BGS to GS on 7/31/2013.

C8812---Pushed from GS to 105.0' BGS. (Push activities completed on 08-08-13)
1st sample recovery from 54.0' BGS to 56.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"= 100%.
2nd sample recovery from 70.0' BGS to 72.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"= 100%. (QC Equipment Blank)
3rd sample recovery from 103.0' BGS to 105.0' BGS: Shoe=90%, Liner "A"=60%, Liner "B"=75%, Liner "C"= 100%. (These % after NCO's processed samples having to drive samples out of barrel section to retrieve liners)
C8812---Decommissioned from 105.0' BGS to GS on 8/8/2013.

C8814---Pushed from GS to 94.0' BGS. (Push activities completed on 08-13-13)
1st sample recovery from 56.0' BGS to 58.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"= 100%. Note: RCT's found Radioactive contamination on sample during processing of sample by NCO's...2500 dpm Bata, Gamma per FWS.
2nd sample recovery from 70.0' BGS to 72.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"= 100%.
3rd sample recovery from 92.0' BGS to 94.0' BGS: Shoe=100%, Liner "A"=100%, Liner "B"=100%, Liner "C"= 100%.
C8814---Decommissioned from 94.0' BGS to GS on 8/15/2013.

From: Michael Ehrgott [mailto:MJEHRGOTT@energysolutions.com]
Sent: Wednesday, April 23, 2014 7:49 AM
To: Sydnor, Harold A; Ehrgott, Mike J
Cc: Gardner, Martin G (Marty); Tabor, Cynthia L; Shrum, Ann; Aquila F. Hoopes; Eberlein, Susan J; Shanda Icayan; McKinney, Steve G; Parker, Dan L (Danny); Berlin, Penelope (Energy Solutions); Franzen, Rick (Sr); Wiegman, Rebecca S; Reynolds, Kent D; Hutchings, Kristopher; Throolin, Jacob W; Michael A. Weakley; Amos, Olin; Withrow, Steven M; Skoglie, David E; Steffler, Rory
Subject: Daily Activity for "TX" Farm Barrier Characterization FY14

TX-Farm Barrier Characterization FY14

ACTIVITIES COMPLETED ON TUESDAY APRIL 22th , 2014

-Install completion caps and well ID tags on C8815, 17, 19, and 21.
-RCT's completed surveying of support equipment from TX Farm.

ANTICIPATED UPCOMING WORK

-Schedule Rig #4 for transport from TX Farm to ENW.
-WRPS to have land surveyors GPS/shoot in Borehole locations.

PROGRESS SUMMARY

EXPLORATORY BORINGS

-C8815 Pushed from GS to 114.0' BGS TD (refusal) (Completed on 01-20-14)
Moisture logging has been completed from 113.0'BGS to GS. (Moisture logging completed on 01-22-14)
Gamma log from 113.0' to GS. (Gamma logging completed on 01-28-14)
During Decommissioning...Set bottom of 1st resistivity Probe @ 107.0'BGS.(performed on 04-18-14).
During Decommissioning...Set bottom of 2nd resistivity Probe @ 76.5'BGS.(Performed on 04-21-14).
Decommissioned from 114.0'BGS to GS (Completed on 04-21-14).
Completion cap and ID tag installed **(Completed on 04-22-14).**

-C8817 Pushed from GS to 112.55' BGS TD (refusal) (Completed on 01-22-14)
Moisture logging has been completed from 111.5'BGS to GS. (Moisture logging completed on 01-23-14)
Gamma logging has been completed from 111.3' to GS. (Gamma logging Completed on 01-30-14)
During Decommissioning...Set bottom of 1st resistivity Probe @ 105.0'BGS.(performed on 04-08-14).
During Decommissioning...Set bottom of 2nd resistivity Probe @ 61.0'BGS.(Performed on 04-08-14).
Decommissioned from 112.55'BGS to GS (Completed on 04-09-14).
Completion cap and ID tag installed **(Completed on 04-22-14).**

-C8819 Pushed from GS to 110.0' BGS TD (refusal) (Completed on 01-23-14)

Moisture logging has been completed from 109.0'BGS to GS. (Moisture logging completed on 02-04-14)

Gamma logged from 108.9' to GS. (Gamma logging Completed on 02-05-14)

Decommissioned C8819 from 109.15'BGS to GS.(Completed on 04-01-14)

During Decommissioning...Set center of 1st resistivity Probe @ 101.25'BGS.(Performed on 03-31-14)

During Decommissioning...Set center of 2nd resistivity Probe @ 82.2'BGS.(performed on 04-01-14)

During Decommissioning...Set center of 3rd resistivity Probe @ 62.2'BGS.(Performed on 04-01-14)

Completion cap and ID tag installed **(Completed on 04-22-14).**

-C8821 Pushed from GS to 109.15' BGS TD (refusal) (Completed on 1-27-14)

Moisture logging has been completed from 108.5'BGS to GS. (Moisture logging completed on 02-03-14)

Gamma logged from 108.5' to GS. (Gamma logging Completed on 02-05-14)

Decommissioned C8821 from 109.15'BGS to GS (Completed on 03-27-14)

During Decommissioning...Set center of 1st resistivity Probe @ 101.25'BGS.(Performed on 03-26-14)

During Decommissioning...Set center of 2nd resistivity Probe @ 81.0'BGS.(performed on 03-27-14)

During Decommissioning...Set center of 3rd resistivity Probe @ 61.0'BGS.(Performed on 03-27-14)

Completion cap and ID tag installed **(Completed on 04-22-14).**

SAMPLE BORINGS

-C8816 -Pushed from GS to 107.0''BGS. (Push activities performed on 02-18-14)

-Pushed **1st** sample from 68.0' to 70.0'BGS. @ 10:38 (Performed on 02-10-14)

1st sample recovery from 68.0' BGS to 70.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%,

Liner "C"=100%.

- Pushed **2nd** sample from 74.5' to 76.5'BGS. @ 09:37 (Performed on 02-11-14)

2nd sample recovery from 74.5' to 76.5'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.

- Pushed **3rd** sample from 105.0' to 107.0'BGS. @ 11:28 (Performed on 02-18-14)

3rd sample recovery from 105.0' to 107.0''BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.(Equipment Blank)

-C8816- Decommissioned to GS (Performed on 02-21-14).

-C8818 -Pushed from GS to 94.0'BGS (Push activities performed on 02-24-14).

-Pushed **1st** sample from 59.0' to 61.0'BGS. @ 09:25 (Performed on 02-24-14)

1st sample recovery from 59.0' BGS to 61.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%,

Liner "C"=100%.

- Pushed **2nd** sample from 67.0' to 69.0'BGS. @ 11:15 (Performed on 02-24-14)

2nd sample recovery from 67.0' to 69.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%,

Liner "C"=100%.
- Pushed 3rd sample from 103.0' to 105.0'BGS. @ 10:15 (Performed on 02-25-14)
3rd sample recovery from 103.0' to 105.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.(Equipment Blank)

-C8818- Decommissioned to GS (Performed on 02-25-14).

-C8820 -Pushed from GSto 69.0'BGS (Push activities performed on 02-26-14).
-Pushed 1st sample from 53.0' to 55.0'BGS. @ 10:05 (Performed on 02-26-14)
1st sample recovery from 53.0' BGS to 55.0' BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%,
Liner "C"=100%.
- Pushed 2nd sample from 83.0' to 85.0'BGS. @ 11:58 (Performed on 02-27-14)
2nd sample recovery from 83.0' to 85.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.

- Pushed 3rd sample from 100.0' to 102.0'BGS. @ 10:45 (Performed on 03-03-14)
3rd sample recovery from 100.0' to 102.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.(Also obtained Field Blank. Sample# B2V7F6)

-C8820- Decommissioned to GS (Performed on 03-03-14).

-C8822- Pushed from GS to 107.0'BGS (performed on 03-06-14).
Drove from 24.6 ft bgs to 50.0 ft bgs. Sampled at first interval from 50' to 52', Sample numbers B2V733,
B2V734, B2V735, and B2V736 @ 100 % recovery.
Drove from 52 ft bgs to second sampling interval @ 59 ft bgs. (performed on 03-04-14).
- Pushed 2nd sample from 59.0' to 61.0'BGS. @ 09:35 (Performed on 03-05-14)
2nd sample recovery from 59.0' to 61.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.
- Pushed 3rd sample from 101.0' to 103.0'BGS. @ 10:05 (Performed on 03-07-14)
3rd sample recovery from 101.0' to 103.0'BGS: Shoe=100.0%, Liner "A"=95%, Liner "B"=100%, Liner "C"=100%.
- Pushed 4th sample from 107.0' to 109.0'BGS. @ 10:10 (Performed on 03-10-14)
4th sample recovery from 107.0' to 109.0'BGS: Shoe=100.0%, Liner "A"=100%, Liner "B"=100%, Liner "C"=100%.

-C8822- Decommissioned to GS (Performed on 03-10-14).

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