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RPP-RPT-49956, Rev. 0

Completion Report for the 241-C Tank Farm, C-104 Angle Direct Push Characterization

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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: 242

Key Words: 241-C Tank Farm, 241-C-104, Angle Direct Push, , Vadose, Geophysical Logging, Soil Sampling

Abstract: This report contains information for field activites and geophysical logging results.

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SEP 09 2011
DATE:
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STA: 15
ID. 24
Release Stamp

Kelly Wheeler 9/9/11
Release Approval Date

Approved For Public Release

RPP-RPT-49956
Revision 0

Completion Report for the 241-C Tank Farm, C-104 Angle Direct Push Characterization

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

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC27-08RV14800

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TERMS

DOE	U.S. Department of Energy
Ecology	State of Washington, Department of Ecology
Energy*Solutions*	Energy*Solutions* Government Group
msl	mean sea level
RPP	River Protection Project
WAC	*Washington Administrative Code*
WRPS	Washington River Protection Solutions, LLC

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COMPLETION REPORT FOR THE 241-C TANK FARM, C-104 ANGLE DIRECT PUSH CHARACTERIZATION

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) assigned the River Protection Project (RPP) Washington River Protection Solutions, LLC (WRPS) Richland, Washington, to collect and provide subsurface data from inside the 241-C Tank Farm located in the 200 East Area of the Hanford Site. WRPS contracted Energy*Solutions* Government Group (Energy*Solutions*) to perform the field activities required to gather this data. This data was intended to provide information about the distribution and movement of contaminants in the vadose zone under and adjacent to the tank farms, and it will be used for eventual retrieval of stored tank waste and closure planning for the single-shell tanks.

FSWO-DOW-035, *Description of Work: Direct Push 241-C Farm, C-104 Angle FY 2011*, Rev. 1 (see Appendix A) provides a detailed description of the scope of work performed. Energy*Solutions* was responsible for the provision of equipment and personnel to conduct the direct push activities, soil sample collection, and safety oversight. The following were also included in the overall Energy*Solutions* work scope: Providing subcontract geophysical logging services, providing technical support, and preparing final reports. The following appendices contain copies of documentation generated during the performance of the above work scope.

Appendix A, FSWO-DOW-035, *Description of Work: Direct Push 241-C Farm, C-104 Angle FY 2011*, Rev. 1
Appendix B, Global Positioning System Coordinates and Map
Appendix C, Drilling and Sampling Daily Work Records
Appendix D, Small Diameter Geophysical Logging for FY 2011, C-104 Angle Direct Push, 241 C Farm Characterization
Appendix E, Sample Determination Meeting Minutes
Appendix F, Chain of Custody Forms and Sample Documents
Appendix G, Washington State Department of Ecology Documents
Appendix H, Safety Documentation

2.0 SUMMARY OF ACTIVITIES

A Description of Work for this project was prepared and submitted in December 2010. This Description of Work provides detailed work instructions and information for conducting characterization efforts inside the 241-C Tank Farm. A hydraulic hammer unit was used for placing two angled boreholes to the approximate target depth of

66.75 meters (219 ft) below ground surface for geophysical logging and sample collection. The dip angle of the probehole was targeted to be 60 degrees from horizontal. The exploratory borehole was designated as C8099. At the direction of the Closure and Corrective Measures Technical Point of Contact (hereafter referred to as "WRPS technical contact"), the exploratory borehole was extended to a depth of 78.12 meters (256.3 ft) below ground surface. This exploratory borehole was used for geophysical logging and resistivity probe placement. An offset borehole (C8100) adjacent to the exploratory borehole was then pushed for sample collection. The location of this sample borehole was determined by the WRPS technical contact. Sample depths were chosen based on the previously obtained geophysical logging data and available dry well logging information. Total depth for the sample borehole was based on sampling requirements. Meeting minutes for sample depth determination are provided in Appendix E. Sampling information and documentation is provided in Table 1 and Appendix F.

The borehole locations were selected based on ground-penetrating radar data and as-built infrastructure drawings. The initial investigation included geophysical logging from total depth to surface using a Bismuth Germinate Oxide spectral gamma scintillation detector and a neutron-neutron moisture probe. Because angle drilling is can be altered by subsurface geological features, a slim hole gyroscope was also used to track the deviation of the angle hole. This logging data is intended to ensure target accuracy, aid in defining the extent of subsurface contamination, and provide guidance for sample interval selection.

The length of the gyroscope tool and a severe bend in the tubing at a depth of 52.73 meters (173 ft) below ground surface would not allow the gyroscope tooling to pass limited gyroscope data for C8099. At the 52.73 meter (173 ft) depth, the borehole had deviated from the established target by 3.44 meters (11.28 ft). The adjacent sampling borehole, C8100, was advanced to a final depth of 68.52 meters (224.8 ft). Gyroscope data revealed that the bottom of C8100 was 4.37 meters (14.33 ft) off the proposed target.

Low levels of Cesium-137 (Cs-137) were detected in C8099. A maximum concentration of 5.8 pCi/g of Cs-137 was detected at 5.18 meters (17 ft). There was no other low-energy gamma activity other than that from natural activity. At the direction of the WRPS technical contact, moisture logging was conducted on sample borehole C8100 for correlation to the exploration probehole. Detailed results from the geophysical logging activities are provided in Appendix D.

The hydraulic hammer unit and associated personnel initially began mobilization and site setup December 27, 2010. Because of construction in the immediate area of the C8099 investigative push location, Energy*Solutions* field crews staged drilling equipment and support items at the 241-C Tank Farm angle hole investigative location on January 11, 2011 and initiated pushing the first borehole on January 12, 2011. The work scope was completed April 7, 2011.

There were 65 field days for completion of the 241-C Tank Farm activities. Including construction interference, there were 330.5 hours (36.72 nine-hour days) of down time

associated with this task. For exact dates and explanations of down time, refer to the Drilling and Sampling (Percussion) Daily Work Records located in Appendix C.

Table 1. C8100 Sample Intervals.

Borehole Number	Depth In Ft (Pipe run from ground surface)	Sample Number	QC/Percent Recovery
C8100	NA	B2B1L6	Surface Sample
	NA	B2B1L7	Surface Sample Duplicate
	5.7-7.7	B2B1M0, B2BX79, B2BX80, B2BX81	69%
	15-17	B2BX89, B2B1M1, B2B1M2, B2B1M3	40%
	17-19	B2BX90, B2B1M4, B2B1M5, B2B1M6	48%
	54-56	B2BXR4, B2B1M7, B2B1M8, B2B1M9	45%
	56-58	B2B435, B2B1N0, B2B1N1, B2B1N2	43%
	76-78	B2B436, B2B1N3, B2B1N4, B2B1N5	100%
	NA	B2B1N6	Equipment Blank
	118-120	B2B437, B2C1K8, B2C1K9, B2C1L0	100%
	168.6-170.6	B2B438, B2C1L1, B2C1L2, B2C1L3	100%
	202-204	B2C1L4, B2C1L6, B2C1L7, B2C1L8	90%
	222.8-224.8	B2C1L5, B2C1L9, B2C1M0, B2C1M1	100%

3.0 DIRECT PUSHING, SAMPLING AND LOGGING DETAILS

3.1 DIRECT PUSHING

In accordance with FSWO-DOW-035, Rev. 1, exploration hole placement and sampling was accomplished with the use of a hydraulic hammer system mounted on a tractor-type carrier. For investigative purposes, a 6.35 centimeter (2.5-in.) outside diameter x 4.45 centimeter (1.75-in.) inside diameter casing was driven at predetermined locations to specified depths, or refusal. Once a push location was geophysically logged, the data was reviewed by WRPS, DOE, and the State of Washington, Department of Ecology (Ecology) personnel and sample locations and depths were selected. A second location within approximately 0.6 meter (2 ft) of the exploratory hole was then pushed for sample collection.

3.2 SOIL SAMPLING

Soil sampling with the rotary hammer unit was accomplished with the dual-wall sampling system. With the dual-wall system, once sample depth has been reached, the inner rod with the dummy drive tip is removed, and the drive tip is replaced with a sampler. The sampler consists of a 6.67 centimeter (2.625-in.) outside diameter x 4.76 centimeter (1.875-in.) inside diameter outer sample barrel, which holds a 4.13 centimeter (1.625-in.) outside diameter x 48.63 centimeter (18.75-in.) long inner sample barrel. The inner sample barrel houses three 3.18 centimeter (1.25-in.) outside diameter x 15.24 centimeter (6-in.) long stainless-steel sample liners. Once the sampler and inner rod have been lowered and seated into the outer drive rod, the two are simultaneously advanced far enough to ensure that the sampler is completely filled with material. Unless refusal is met, the sampler is typically driven 0.61 meters (2 ft). Table 1 shows the locations, intervals, sample numbers, and percent of sample recovered. Table 2 shows the coordinates and elevations of the midpoint of each sample location as determined by the gyroscope.

Table 2. C8100 Sample Interval Coordinates.

Sample Mid Point (Pipe run from ground surface, ft)	Northing	Easting	Elevation (Ft)
Surface	136515.05	575116.28	664.00
6.7	136515.505	575117.18	658.16
16.0	136516.143	575118.43	650.06
18.0	136516.28	575118.7	648.33
55.0	136518.879	575123.75	616.38
57.0	136519.025	575124.03	614.64
77.0	136520.483	575126.81	597.49
119.0	136523.746	575132.82	561.65
169.6	136528.154	575140.21	520.04
203.0	136531.556	575145.27	493.30
223.8	136533.902	575148.43	477.01

The sample tip, drive head, sample liners, and inner sample barrel were cleaned by 222-S lab technicians using standard *Resource Conservation and Recovery Act of 1976* protocol cleaning methods in accordance with ATL LO-080-157, *Cleaning of Containers and Sample Collection Equipment*. The purpose of this cleaning is to ensure that no cross contamination is introduced from any previous use of the equipment or from the manufacturing process. In accordance with RPP-PLAN-38777, 2011, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev 2, an equipment blank was taken to verify the cleaning process is working as intended.

Samples were obtained and analyzed in accordance with WRPS Sample Authorization Form #V11-001 and #V11-003. Samples were analyzed for inductively coupled plasma metals, anions, polychlorinated biphenyls, pH, radioisotopes and several other analytes. Copies of the sample authorization forms, chain of custody forms, and associated paperwork are provided in Appendix F.

3.3 GLOBAL POSITIONING SATELLITE SURVEYING

With the use of a Trimble[1] 5800 Global Positioning Satellite Survey system and per FSWO-DOW-035, Rev. 1, the original locations of the exploratory boreholes were identified using paint and stakes. Once the task was completed and the boreholes

[1]Trimble is a registered trademark of Trimble Navigation Ltd., Sunnyvale, California.

decommissioned, each exploratory and sample borehole was re-surveyed for accuracy. These recorded coordinates were placed on a map showing their locations in direct relation to structures and underground storage tanks in the vicinity. The borehole starting coordinates, elevations, and a map showing completed boreholes are provided in Appendix B.

3.4 GEOPHYSICAL LOGGING

Pacific Northwest Geophysics and Three Rivers Scientific conducted the geophysical logging data collection and analysis services on the exploration 6.35 centimeter (2.5-in.) probe borehole and the 6.67 cm (2.625 in.) sampling probe borehole. For the geophysical logging, a portable small diameter logging system was used to collect spectral gamma and moisture data from the bottom of the borehole to the ground surface. A slim hole gyroscope was used to collect survey data to establish the boreholes true trajectory. Calibration and operation details, survey results and data interpretation, as well as copies of the collected and processed log data, are provided in Appendix D.

4.0 BOREHOLE DECOMMISSIONING

Decommissioning of all the boreholes was conducted in accordance with the *Washington Administrative Code* (WAC) 173-160 requirements. To decommission the sample borehole, the tubing was back pulled while granular bentonite was simultaneously added to the tubing until it reached the surface.

The logging borehole required decommissioning with simultaneous placement of resistivity probes. This was accomplished by knocking the drive tip out of the bottom of the tubing then back pulling the tubing while filling it with bentonite to near the desired probe placement depth. Approximately 0.3 meter (1 ft) of silica sand was then added to within 0.15 meter (6 in.) of the depth at which the resistivity probe was to be placed. The resistivity probe was placed, and then approximately 0.91 meter (3.0 ft) of diatomaceous earth was added to the borehole, encasing the probe. Approximately 3.79 liters (1.0 gal) of water was then added, followed with another 0.3 meter (1 ft) of silica sand. Granular bentonite was then placed from above the sand to near the next probe depth. This process was repeated for the second probe location. After both probes were placed, granular bentonite was added to surface while back pulling the remaining tubing. A protective steel casing was cemented in place approximately 30.48 centimeters (12 in.) deep at the surface to protect the protruding probe wiring. The protective steel casing was then identified with a brass tag. Ecology documentation (Resource Protection Well Reports) is provided in Appendix G.

Table 3 shows the exploration and sampling borehole well identification numbers, coordinates, total depth, and placement depths of resistivity probes.

Table 3. Borehole Information.

Borehole # and Type	Northing (meters)	Easting (meters)	Elevation (msl) (meters)	Hole Depth (ft)	Multi-Level Probe(s) Depth (ft)
C8099 Logging	136514.24	575116.69	202.39	256.3	102 and 171
C8100 Sampling	136515.05	575116.28	202.39	224.8	NA

5.0 ENVIRONMENTAL, SAFETY AND HEALTH

During the 241-C Tank Farm activities Energy*Solutions* Operations Safety personnel provided periodic site surveillances for safety and health compliance. The work scope conducted under the subject statement of work was completed with no lost time, reportable *Occupational Safety and Health Act of 1970* injuries, or first aid cases, and there were no incidences of equipment or personnel being radiologically contaminated. Associated safety documentation is provided in Appendix H.

6.0 REFERENCES

ATL LO-080-157, *Cleaning of Containers and Sample Collection Equipment*, Advanced Technologies and Laboratories International, Inc., Richland, Washington.

RPP-PLAN-38777, 2011, *Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C*, Rev. 2. Washington River Protection Solutions, LLC, Richland, Washington.

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," *Washington Administrative Code*, as amended.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

Occupational Safety and Health Act of 1970, 29 USC 651 et seq.

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APPENDIX A

FSWO-DOW-035, *DESCRIPTION OF WORK: DIRECT PUSH241-C FARM C-104 ANGLE FY 2011,* REV. 1

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ENERGYSOLUTIONS

DATA CHANGE NOTICE (DCN)

DCN Controlled Number: 01243

Release Information: 12/14/10

DCN Category (mark one)	Originator's Name/Phone Number	Client/Company
	P. C. Berlin/375-9512	H. A. Sydnor/WRPS/372-3967

Supplemental [ ]	Project Title		Required Response Date
Direct Revision [X]	FY 11 C Farm Characterization – C-104 Angle Push		NA
Change DCN [ ]	Document Numbers Changed by this DCN (include sheet no. and rev.)	Related DTF/DCN No(s)	Project/Crosswalk No.
Cancel/Void [ ]	FSWO-DOW-035, Rev.0	See DTF 01769	141905-3647224.001

Design Baseline Document? [ ] Yes [ ] No	Affected Documents (Procedures, etc.)	Related PO Number

Description of Change

Document was revised to correct figure and coordinates of direct push locations.

Justification

Previous figure and coordinates were incorrect.

Was QA-managed safety software (Level A, B, or C) used in the documentation attached to this DCN (i.e., report, evaluation, or calculation)? [ ] Yes [X] No [ ] N/A If the answer to this question is "yes," per FSWO QP 3-2 and QP 3-10, identify the applicable software by name and version in the space below.

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Design Verification

Design verification required? [ ] Yes [X] No

Design verification of this change was performed and the change(s) were found not to adversely impact the underlying safety basis.

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SIGNATURES

Title	Name	Signature	Date
Originator	PC Berlin		12/14/10
Project/Task Manager	KD Reynolds	for	12/14/10
QA	N/A		
Responsible Manager	MG Gardner		12/14/10
Safety	RW Zane/KD Hutchings		12/14/10
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FSWO-004 11/07

FSWO-DOW-035
Revision 1

DESCRIPTION OF WORK: DIRECT PUSH 241-C FARM C-104 ANGLE FY 2011

December 2010

Prepared for
Washington River Protection Solutions, LLC

by
Technical Services
Energy*Solutions* Federal Services, Inc., Northwest Operations

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TERMS

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
DOE	U.S. Department of Energy
DOW	description of work
Energy*Solutions*	Energy*Solutions* Federal Services, Inc., Northwest Operations
ES&H	Environmental, Safety, and Health
ID	inside diameter
OD	outside diameter
RCRA	*Resource Conservation and Recovery Act of 1976*
RPP	River Protection Project
SST	single-shell tank
WAC	*Washington Administrative Code*
Well ID	Well identification
WMA	Waste Management Area
WRPS	Washington River Protection Solutions, LLC

FSWO-DOW-035, Rev. 0

DESCRIPTION OF WORK: DIRECT PUSH 241-C FARM C-104 ANGLE FY 2011

1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

To meet the requirements of the *Resource Conservation and Recovery Act of 1976* (RCRA) and to provide for integration of these requirements with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) an implementation plan (RPP-PLAN-37243, *Phase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas*) was generated. This implementation plan integrates the RCRA treatment, storage, and disposal unit closure process with the CERCLA groundwater and operable unit remedial investigation/feasibility study process. RPP-RPT-38152, Rev. 0, *Data Quality Objectives Report Phase 2 Characterization for Waste Management Area C Corrective Measures Study* outlines data that is to be collected to support the integration of these two regulatory drivers and meet the unit closure objectives. Washington River Protection Solutions, LLC (WRPS) generated a work plan (RPP-PLAN-39114, Rev. 1A) which describes the field work necessary to collect the data identified in the data quality objective document. This description of work (FSWO-DOW-035, Rev. 1) provides the work instructions for conducting characterization and sampling efforts inside the 241-C Tank Farm at Site J as listed in RPP-PLAN-39114, Rev. 1A or latest revision. The document was revised to correct probehole coordinates. The scope of work includes: providing equipment and personnel to conduct direct push activities; supporting soil sample collection by WRPS sampling personnel; providing safety oversight; providing geophysical logging services; attending meetings and planning sessions; and providing a written report documenting field activities and data collection at the conclusion of field activities. This work is being conducted at the direction of WRPS Closure and Corrective Measures group.

1.2 BACKGROUND

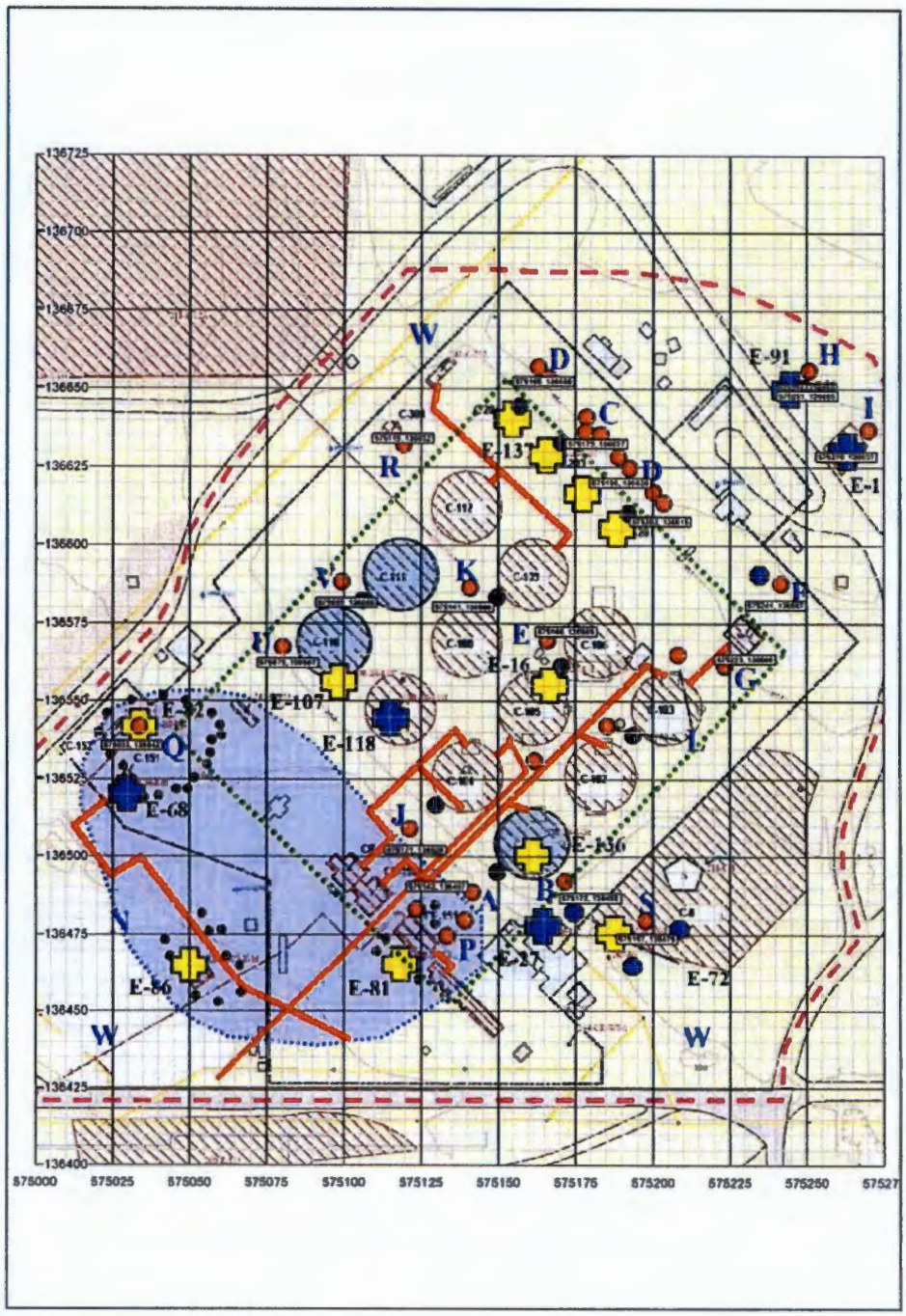
The U.S. Department of Energy (DOE) assigned the River Protection Project (RPP) Single-Shell Tank Program the tasks of transferring waste from the single-shell tanks (SST) to double-shell tanks, and developing and implementing a strategy to retrieve SST and miscellaneous underground storage tank waste. The WRPS Closure and Corrective Measures group was given responsibility for collecting and providing subsurface data from the SST farm facilities. This contributes to preparation for the eventual retrieval of the storage tank waste. The intent of the SST Waste Management Area's (WMA) characterization program is to collect and analyze samples to provide an understanding of the distribution and movement of contaminants in the vadose zone under and adjacent to the tank farms. These SST farms are designated as Radiological Buffer Areas or Contamination Areas.

1.3 TANK FARM BACKGROUND

The Hanford Site has 149 underground SSTs that store hazardous radioactive waste. These tanks are grouped into 12 tank farms that are further grouped into eight WMAs and are regulated under RCRA. WMA C encompasses the C Tank Farm located in the east central portion of the 200 East Area (Figure 1) and includes soil and groundwater contaminated by C Tank Farm operations. C Tank Farm was constructed from 1944 to 1945, and began operations in the late 1940s. In general, the WMA C boundary is represented by the fence line surrounding the C Tank Farm. Many of these tanks have leaked, and there have been leaks in the associated infrastructure (e.g., pipelines, diversion boxes). Some of the leaked waste has been shown to have impacted groundwater and exceeded compliance standards.

The C Tank Farm contains twelve 100-series tanks and four 200-series tanks. The 100-series tanks are 23 m (75 ft) in diameter, have a 5 m (15-ft) operating depth, and have an operating capacity of 1,892,700 L (530,000 gal) each. The 200-series tanks are 6 m (20 ft) in diameter with a 7.32 m (24-ft) operating depth and an operating capacity of 208,000 L (55,000 gal) each. The tanks sit below grade with at least 2 m (7 ft) of soil cover that shields operating personnel from radiation exposure. Tank pits are located on top of the tanks and provide access to the tanks, pumps, and monitoring equipment.

Figure 1. 241-C Tank Farm Location Map.



1.4 PHYSICAL SETTING

The SST tank farms were constructed in excavations into the near-surface sediments that overlie the Columbia River Basalt Group. The Columbia River basalt forms the basement bedrock. There are approximately 150 m (500 ft) of continental sediments that overlie the basalt. From oldest to youngest, these deposits include the following.

- Several facies of the Miocene-to-Pliocene age, fluvial-lacustrine Ringold Formation.
- Variably cemented and pedogenically altered deposits of the Plio-Pleistocene unit, which developed on the eroded and weathered surface of the Ringold Formation.
- A relatively loose, fine-grained silty-to-sandy unit designated as the Hanford formation/Plio-Pleistocene unit interval.
- Deposits from Pleistocene age cataclysmic floods (i.e., Hanford formation) that blanket the study area with mostly sand- and silt-dominated facies, capped by a sequence of gravel-dominated facies.

2.0 METHOD

The method selected to outline the vertical and horizontal extent of contamination is a hydraulic hammer-driven probe system mounted on a tractor-type carrier. For this application, the locations for investigation (exploration) are selected through an iterative process as outlined in Section 3.0, "Push Locations." Sample depths are to be determined by evaluation of data from the moisture and gamma logs collected from the exploration probeholes. Deepest targeted sample depths will be determined by review of the geophysical data and the total depth achieved by the initial exploratory push. One investigative site (J) is the object of this phase of investigation by exploratory push, geophysical log data collection, and subsequent sampling. At the direction of the Closure and Corrective Measures Technical Lead approximately eight samples will be collected in the adjacent sampling probehole.

2.1 EXPLORATORY PROBEHOLE

The exploratory activities are initiated by placement of a single tubing string that is 6.4 cm (2.5-in.) outside diameter (OD) x 4.45 cm (1.75-in.) inside diameter (ID) (e.g., the exploratory push). This tubing is advanced to the target depth or refusal. Geophysical logging with bismuth germinate oxide gamma and neutron-neutron moisture instrumentation is conducted. The logging data is reviewed by the WRPS Closure and Corrective Measures and Energy*Solutions* Federal Services, Inc., Northwest Operations (Energy*Solutions*) technical personnel to determine target sample collection points. The exploratory push hole will be decommissioned per applicable *Washington Administrative Code* (WAC) 173-160, "Minimum Standards for Construction and Maintenance of Wells," requirements (e.g., filled with bentonite or

bentonite/cement grout as required) as the push tubing is extracted. Multi-resistivity electrodes may be placed in the exploration probeholes during decommissioning at the direction of the Closure and Corrective Measures Technical Lead. When these actions are taken, sand and diatomaceous earth are placed in layers around the sending/receiving segment of the electrode assembly and bentonite is used for the intervals between the electrode assemblies. Cement seals and surface protection will be placed to protect the wire leads at ground surface.

2.2 MULTIPLE SAMPLE PUSH HOLES

Sampling is conducted with outer push tubing that is 6.67 cm (2.625-in.) OD x 4.76 cm (1.875-in.) ID and inner tubing that is 3.81 cm (1.5-in.) OD x 2.54 cm (1.0-in.) ID. The dual wall system with a "dummy" tip is advanced to the predetermined sample depth. When sampling depth is achieved and the rods back-pulled for sampling, the entire tubing string (inner and outer casing) is back-pulled 0.06 m (approximately 2 in.) to 0.12 m (approximately 5 in.) to relieve pressure from the drive shoe and tip. The removable tip is removed by extracting the inner rods. When the inner string of tubing has been removed, a sampler is attached to the inner string and returned to the bottom of the outer casing/push tubing and positioned against the inner receiver face of the drive shoe. The inner and outer tubing strings are "locked" together by use of a proprietary method, and the entire assembly is advanced through the targeted sample interval.

The sampler body holds three stainless steel liners that are 3.17 cm (1.25-in.) OD x 2.7 cm (1.08-in.) ID. After the sampler is advanced approximately 0.6 m (2 ft) the inner string is released and retrieved to surface. The liners are removed from the sampler body and surveyed. Trained sample-handling technicians document recovery, sample condition, and volume recovery percent; then the samples are packaged and transported to the selected laboratory for analysis. The "dummy" tip is reattached to the inner string and returned to bottom and placed in the casing shoe, and the entire assembly is then advanced to the next designated sample depth. This process is repeated until all requested samples have been collected or the tubing meets refusal.

Upon completion of the final sample extraction, or upon meeting refusal, the dummy tip or sampler is removed and the borehole is decommissioned per WAC 173-160 requirements, as described in Section 2.1, "Exploratory Probehole."

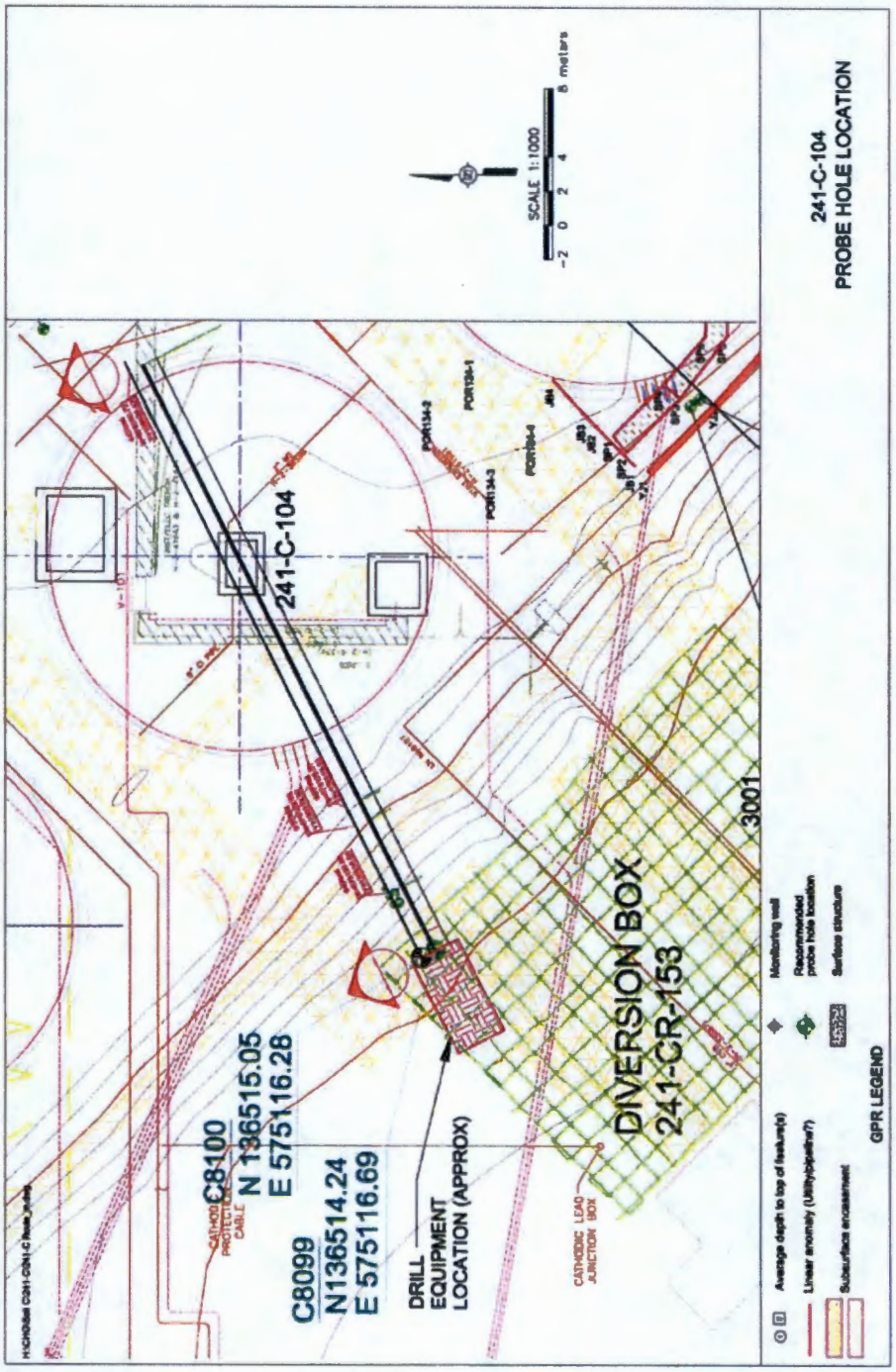
2.3 PLACEMENT OF ANGLE PROBEHOLES

Site J (C-104 push location) will be placed at an angle (60° from horizontal -30° from vertical) to investigate the area under tank C-104. Figure 2 (below) is a map view of the projected exploration probe path originating from the surface at Site J (C-8099) and concluding approximately 66.75 m (219 ft) below ground surface on the east-northeast side of tank C-104. The push location will be staked by use of Global Positioning Satellite equipment, and a bearing azimuth of 63° from true north will be staked in addition to the entry point of the probehole (C-8099 on Figure 2). A 0.76 m x 1.02 m (30-in. x 40-in.) plate with a 60° footplate stop will be placed to act as a guide device to control the angle of the probe as it is advanced. The alignment

of the plate to the 63° bearing and the leveling of the plate will be completed and verified before the plate is secured and the exploratory tubing is driven.

At the conclusion of the exploratory push logging, gyroscope data collection and placement of resistivity electrodes, the surface plate will be moved 0.91 m (3 ft) to either side (as directed by the Closure and Corrective Measures Technical Lead) and re-staked to the ground. The plate will be moved until it is exactly parallel to the original azimuth direction of the exploratory hole.

Figure 2. Map View of C-8099 Position and Path.



3.0 PUSH LOCATIONS

3.1 PUSH LOCATION DOCUMENTATION

Figures 1, 2, and 3 are location maps of the area targeted for direct push activities under tank C-104. This location was selected through an iterative process using ground-penetrating radar data and review of as-built infrastructure drawings. The infrastructure was then plotted in a cross-section view and the planned path of the probe plotted with consideration for clearing the tank wall footer by a minimum of 3.05 m (10 ft). The current planned trajectory will pass the footer elevation at 185.32 m (608 ft) above mean sea level at a distance of 3.41 m (11.2 ft).

The final location coordinates of the selected sites are then plotted with computer-aided drafting. The push locations will be documented on a Well Information Report/Field Activity Report. In addition to the coordinate position of the probe location, the push depth, geophysical log data, and other pertinent information derived during the activity (e.g., depth of contamination as identified from geophysical log interpretation, degree of contamination observed on push rods during extraction) is included in the Field Activity Reports and Washington State Department of Ecology-required documentation.

3.2 PUSH LOCATION TABLES AND NUMBERING

All exploratory and sampling push location activities are tracked and documented on Field Activity Reports by referencing the Well identification (Well ID) number as provided in Figures 2 and 3 or assigned during progress of the work. If sample collection is attempted, a unique Well ID number will be used to track the push location on the Field Activity Report, and the sample will be identified with that Well ID number on the sample label and the shipping documentation. The Well ID for a sample probehole is one number greater than the corresponding exploration probehole (e.g., if a zone of interest is identified during pushing at location Well ID C-8099, the Well ID of the subsequent sampling push is C-8100). The unique Well ID number for the exploratory push location is listed, and the unique sample push Well ID number has been assigned and reserved for use during the Phase 2 C Tank Farm Characterization investigation by the Hanford Site Well Coordinator. The sampling and the single exploration push actions will be documented in the Field Activity Reports and sampling chain of custody forms and located by use of global positioning survey equipment.

4.0 WORK TASKS

4.1 SITE SETUP

The push equipment will be mobilized and a controlled work area set up surrounding the preselected and marked locations (see Figure 2). A radiological presurvey of the tractor and

equipment will be conducted (per WRPS procedure) prior to moving the equipment into the work zone. As noted above, ground-penetrating radar scans and as-built drawing reviews and comparisons have been completed to properly select the push location. The equipment consists of a crawler-mounted mobile unit with a hydraulically powered hammer and mast system. Support equipment to be used during field activities will be mobilized into the work area as needed. A forklift will transport needed support equipment to and from the push locations. Tank farm personnel will provide support, as necessary, for guiding the equipment onto location and for subsequent movement of the unit to the listed push locations.

WRPS Radiological Control Technicians and Nuclear Chemical Operators will be onsite to support work during activities that create potential personnel exposure. Contamination control measures will consist of laying spill protection material beneath the equipment (when required). Spill protection consists of placement of felt and plastic sheeting on and around the direct push unit when necessary and prudent. Control of the work area and control of potential contamination are aided by restricting site entries by unnecessary personnel. WRPS Health Physics personnel will provide direction and support to ensure radiological protection is maintained for all personnel associated with the work.

4.2 PRECAUTIONARY MEASURES

During advancement of the push holes, casing (push rods) will be driven into the subsurface by use of the hydraulic hammer impact system. The push locations have been positioned to avoid impacting known/mapped structures (see Figure 3). The mapped points will be investigated with all due caution and careful observation of the push advance rates, and resistance will be observed to preclude damage to any tank farm infrastructures should the as-built drawings be erroneous. If rod advance indicates that obstructions are present, push advance will stop, the direct push equipment and work area will be placed in safe condition and the Closure and Corrective Measures Technical Lead or his designee, and the WRPS shift supervisor will be notified. If during push operations a push hole is deemed to be "at refusal" as defined by trained operators of the direct push equipment (refusal is defined as a minimum of one inch of advance per minute of impact operations), the depth will be noted in the Field Activity Report and the next sequential task as defined in Section 2, "Method," will be performed.

During pushing activities a gyroscope will be used to verify that the tubing is on the planned trajectory. Three locations have been identified to verify the trajectory. Table 1 represents the three-dimensional locations northing, easting, and mean sea level elevation (xyz) of the center path of the tubing for the exploratory push. Table 3 represents the three-dimensional locations (xyz) of the center path of the tubing for the corresponding sampling push. The data will be reviewed at each location to confirm that the center point of the tubing path is within a 0.76 m (2.5 ft) radius of the three-dimensional locations (xyz) listed in Table 1. A fourth and final gyroscope run will be conducted at total depth to plot the trajectory of the entire probehole. Figure 3 is an A-A' cross-section depicting the tank farm infrastructure near the probe path and the locations where gyroscope data will be collected.

Table 1. Gyroscope Data Collection Points for Site J—Tank C-104.

Northing (x)	Easting (y)	Elevation (msl) m/ft (z)	Pipe run length from surface
136514.24	575116.69	202.39 m (664 ft)	-0-surface
136516.15	575120.48	195.07 m (640 ft)	8.44 m (27.7 ft)
136518.14	575124.40	187.45 m (615 ft)	17.25 m (56.58 ft)
136518.69	575125.50	185.32 m (608 ft)	19.71 m (64.66 ft)
136531.68	575151.10	135.64 m (445 ft)	77.08 m (252.88 ft)

The probe will be advanced 1.04 m (3.4 ft) past each of the pipe run lengths noted above before a gyroscope run is performed. The additional length is necessary to assure that the midpoint of the gyroscope is at the correct elevation for data collection at the pipe run lengths noted above. Table 2 and 4 show the actual measured pipe length that must be pushed before each gyroscope run in the exploratory push and the sampling push respectively.

Table 2. Pipe Run Lengths for Gyroscope Data Collection For Site J—Tank C-104.

Data Collection Point	Total pipe run length
8.44 m (27.7 ft)	9.48 m (31.1 ft)
17.25 m (56.58 ft)	18.28 m (59.98 ft)
19.71 m (64.66 ft)	20.74 m (68.06 ft)
77.08 m (252.88 ft)	78.11 m (256.28 ft)

At each of the data collection points the data will be analyzed and a plot will be constructed depicting the path of the probe. The center point of the probe path will be evaluated to determine the actual position relative to the three-dimensional location (xyz) shown in Table 1. If the data indicates that the path is within a 0.76 m (2.5-ft) radius of the target location, the probe can be advanced. The Closure and Corrective Measures Technical Lead will provide the final decision for advancement of the probe beyond the data collection points listed. If the data indicates that the probe path is not within the 0.76 m (2.5 ft) radius, but is not directed toward the tank, the technical lead can direct that the probe be advanced.

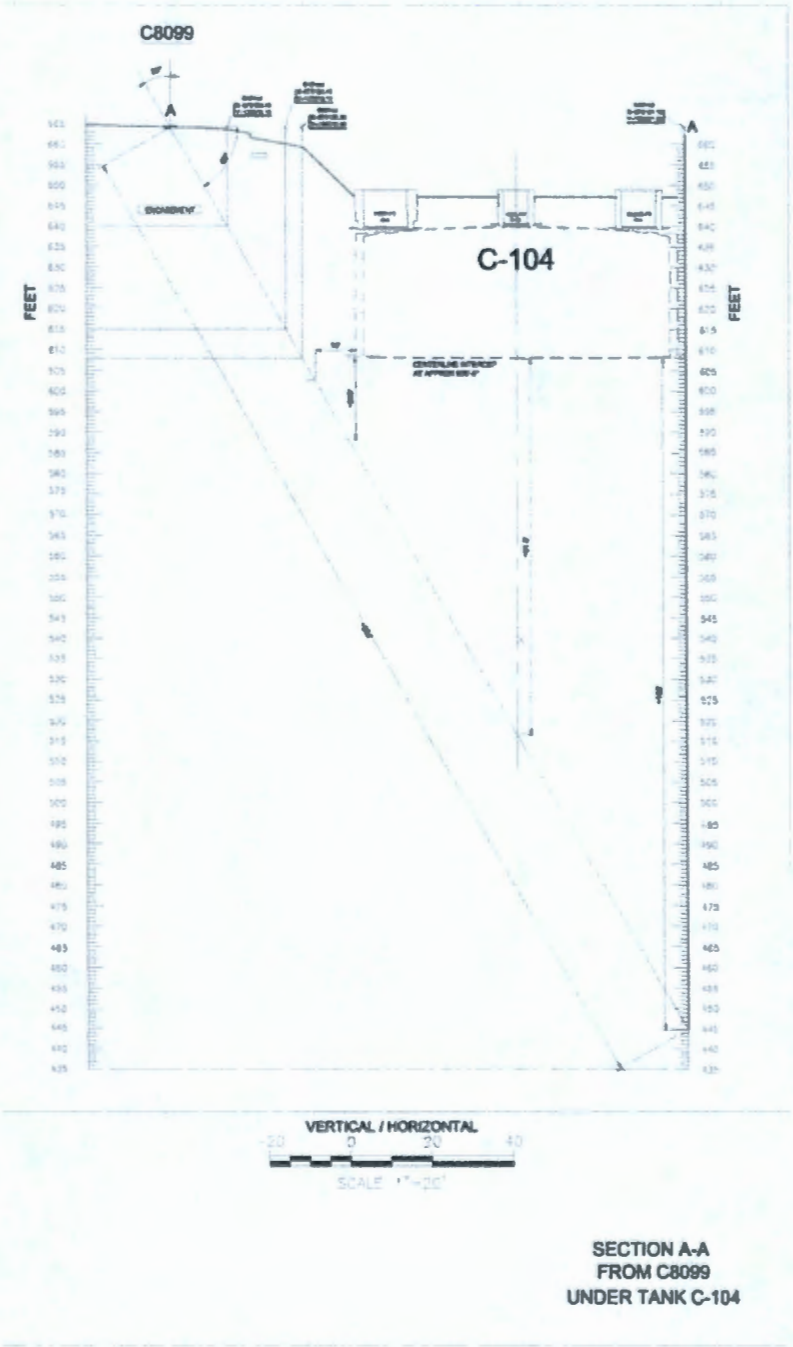
Table 3. Sampling Gyroscope Data Collection Points for Site J—Tank C-104.

Northing (x)	Easting (y)	Elevation (msl) m/ft (z)	Pipe run length from surface
135515.05	575116.28	202.39 m (664 ft)	-0-surface
136516.98	575120.06	195.07 m (640 ft)	8.44 m (27.7 ft)
136518.97	575123.98	187.45 m (615 ft)	17.25 m (56.58 ft)
136519.53	575125.07	185.32 m (608 ft)	20.32 m (66.66 ft)
136532.43	575150.72	135.64 m (445 ft)	77.08 m (252.88 ft)

Table 4. Sampling Pipe Run Lengths for Gyroscope Data Collection for Site J—Tank C-104.

Data Collection Point	Total pipe run length
8.44 m (27.7 ft)	9.48 m (31.1 ft)
17.25 m (56.58 ft)	18.28 m (59.98 ft)
20.32 m (66.66 ft)	20.74 m (68.06 ft)
77.08 m (252.88 ft)	78.11 m (256.28 ft)

Figure 3. Cross Section of Path for C-8099.



All activities using the hammer unit will conform to the manufacturer's operating manual and applicable procedures and Work Package instructions that relate to the specific phase of work. As the push rods are extracted from the exploratory and sampling holes, the onsite Health Physics Technician will monitor for radiological contamination. WRPS tank-farm-qualified Nuclear Chemical Operators will perform any decontamination required. The sealing requirements for decommissioning of the push holes are defined in the appropriate sections of WAC 173-160.

4.3 GEOPHYSICAL LOGGING

At refusal or target total depth of the exploratory investigations, Pacific Northwest Geophysics will conduct logging operations to gather geophysical information. These geophysical investigations will be conducted in addition to the gyroscope data collection noted above in Section 4.2, "Precautionary Measures." The following logging suites will be used.

1. Bismuth germanium oxide @ 100 seconds/0.5 ft.
2. Additional logging with the "Red" and/or "Green" Geiger/Muller equipment, if necessary, based on observed bismuth germanium oxide results.
3. Moisture logging @ 15 seconds/0.25 ft.

Logging data will be collected from surface to the total depth of the tubing. The logging analyst, Energy*Solutions* personnel and the WRPS Closure and Corrective Measures Technical Lead will review the field log data. Based on the log data sets, sampling intervals may be selected. Logging activities will be conducted in accordance with applicable Pacific Northwest Geophysics and Energy*Solutions* procedures and the Energy*Solutions* Quality Assurance Plan.

5.0 SAMPLING

5.1 SAMPLING PROCESS

The sampling process will entail a multiple sampling method as described in Section 2.0.

After retrieving the sampler to surface, the sampling system will be disassembled and the stainless steel liners will be removed for packaging and shipment to the designated laboratory. If opening of the retrieved sampler would result in more than the allowable dose rates per the Radiation Work Permit, the sampler will be placed in a transportation drum and opened under controlled conditions at the designated laboratory, or as directed by the Radiation Control organization.

5.2 CLEANING

Quality control requires that all materials (e.g., sample liners, material retaining baskets [finger baskets], sample caps) used for the performance of sampling activities will be cleaned using U.S. Environmental Protection Agency guidelines/specifications as referenced in the RCRA. Cleaning of samplers, liners, etc. is the responsibility of the 222S Laboratory personnel. WRPS Nuclear Chemical Operators will transport the clean sampling equipment to the job site. Equipment used for push advance purposes (e.g., push rods, tips) will be high-pressure washed using an approved nonphosphate cleaner. If it is not possible to remove the push equipment from the tank farm for cleaning Washington State Department of Ecology has granted a variance to allow for hand cleaning and wiping of the rods to meet WAC cleaning requirements. The push equipment will be visibly free of dirt, grease and other possible contamination, which would potentially provide for cross-contamination of retrieved samples. After being cleaned, the equipment will be protected from unwanted contamination from surface chemicals and push operation-related chemicals. This protection will be accomplished by covering the materials with plastic or other acceptable materials, if necessary. The cleaned and protected equipment will be tracked by use of cleaning certification documentation.

5.3 RINSATE SAMPLES

Field equipment rinsate blanks may be required for analysis purposes. This determination and collection of these rinsate samples is the responsibility of WRPS and their designated personnel.

5.4 EXPLORATION AND SAMPLING PUSH HOLE DECOMMISSIONING

Applicable requirements contained in WAC 173-160 will be used to control and guide actions for decommissioning the sampling and exploratory probeholes. Each probe and sampling hole will be filled with bentonite, a bentonite slurry, and/or grout (neat cement or cement-bentonite mixture) during the push rod extraction process. At the direction of the WRPS Closure and Corrective Measures Technical Lead, subsurface resistivity probes may be placed in the exploratory probeholes. Placement of the restivity instrumentation and decommissioning materials used will be documented on the daily Field Activity Report and WAC Well Report.

6.0 ENVIRONMENTAL, SAFETY, AND HEALTH PROGRAM

The primary concern for Energy*Solutions* and the client (WRPS) is the safety of personnel assigned to perform activities related to the 241-C Tank Farm Phase 2 investigation and characterization. These issues are addressed and all Energy*Solutions*, WRPS, and applicable *Occupational Safety and Health Act of 1970* safety and health requirements are applied and adhered to during the field operations. An activity-specific Job Hazard Analysis outlines the specific activity hazards and the mitigation methodologies. The documentation governing the

operation of the direct push rig, sampling, and decommissioning activities (JHA-10-007, *C-104 Hydraulic Hammer Unit Operations,* Rev. 0, or most current revision) is included as a portion of the WRPS Tank Farm Work Package.

Both Energy*Solutions* Safety personnel and WRPS Tank Farm Industrial Hygiene and Safety personnel will survey the job site for safety and health compliance. Energy*Solutions* personnel and safety representatives will provide onsite inspections and visits during drilling, sampling and decommissioning/construction activities to ensure compliance with the guidance outlined in the Job Hazard Analysis. Routine inspection reports will be provided to the WRPS Closure and Corrective Measures Technical Lead.

Energy*Solutions* subscribes to the Integrated Safety Management System and has implemented an Integrated Safety Management System approach into all of its work tasks. These requirements flow down, not only internally to Energy*Solutions* employees but also to Energy*Solutions* subcontractors. All of the following are in effect and will be observed, enforced and followed.

- Safety rules and procedures for safe job performance.
- Radiological Work Permit.
- WAC 173-160, as amended.
- *Occupational Safety and Health Act of 1970.*
- Client-identified standards.

These requirements are communicated to everyone associated with the project (visitors included) using the Energy*Solutions* Activity Hazard Analysis. The Activity Hazard Analysis is part of the Energy*Solutions* Environmental, Safety, and Health (ES&H) Program.

This program encompasses environment, safety and health, including pollution prevention and waste minimization. All work for this project will be analyzed in accordance with the five core functions of the Energy*Solutions* Integrated Safety Management System.

- Define the scope of work.
- Identify the work hazards and ES&H requirements.
- Analyze the work hazards and implement controls.
- Perform the work activity within the developed controls.
- Provide feedback on the adequacy of controls and safety management improvement.

The specific procedures used to accomplish these core functions are found in the Energy*Solutions* ES&H Program.

6.1 ENVIRONMENTAL, SAFETY, AND HEALTH PROGRAM KEY ELEMENTS

- Line management is responsible for the protection of employees, the public, and the environment.
- Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels.
- Personnel have "stop work" authority.
- Personnel possess the experience, knowledge, skills and abilities that are necessary to discharge their responsibilities.
- Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.
- Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements is established which, if properly implemented, provides adequate assurance that employees, the public and the environment are protected from adverse consequences.
- Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents, unplanned releases, and exposures.

6.2 WRPS-REQUIRED ENVIRONMENTAL, SAFETY, AND HEALTH ELEMENTS

WRPS has provided a comprehensive list of WRPS, DOE and Hanford Site-specific procedures and requirements for conducting work within the confines of the C Tank Farm. While executing the work scope detailed in this DOW, Energy*Solutions* will comply with all applicable directives and orders resulting from WRPS requirements.

7.0 QUALITY ASSURANCE

All work on the Hanford Site is subject to the requirements of DOE Order 5700.6C, *Quality Assurance*. A Quality Assurance program has been described in applicable sections of FS-WO-QAPP-001, *Federal Services Hanford Quality Assurance Program Plan*, and FSWO-QAP-001, *Quality Assurance Procedures*.

All work will be performed in accordance with approved procedures and this work plan.

8.0 REFERENCES

JHA-10-007, 2010, *C-104- Direct Push Hydraulic Hammer Unit Operations*, Rev 0, Energy*Solutions* Technical Services, Richland, Washington.

DOE Order 5700.6C, 1991, *Quality Assurance*, U.S. Department of Energy, Washington, D.C.

FS-WO-QAPP-001, *Federal Services Hanford Quality Assurance Program Plan*, Energy*Solutions* Federal Services, Western Operations, Richland, Washington.

FSWO-QAP-001, *Quality Assurance Procedures*, Energy*Solutions* Federal Services, Western Operations, Richland, Washington.

Occupational Safety and Health Act of 1970, 29 USC 651 et seq.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

RPP-PLAN-37243, 2010, *Phase 2 RCRA Facility Investigation/Corrective Measures Study Master Work Plan for Single-Shell Tank Waste Management Areas*, Rev. 2, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-PLAN-39114, 2010, *Phase 2 RCRA Facility Investigation/Corrective Measures Study Work Plan for Waste Management Area C*, Rev. 1A, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-RPT-38152, 2008, *Data Quality Objectives Report Phase 2 Characterization for Waste Management Area C Corrective Measures Study*, Rev. 0, Cenibark International, Inc., Richland, Washington.

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells," *Washington Administrative Code*, as amended.

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APPENDIX B

GLOBAL POSITIONING SYSTEM COORDINATES AND MAP

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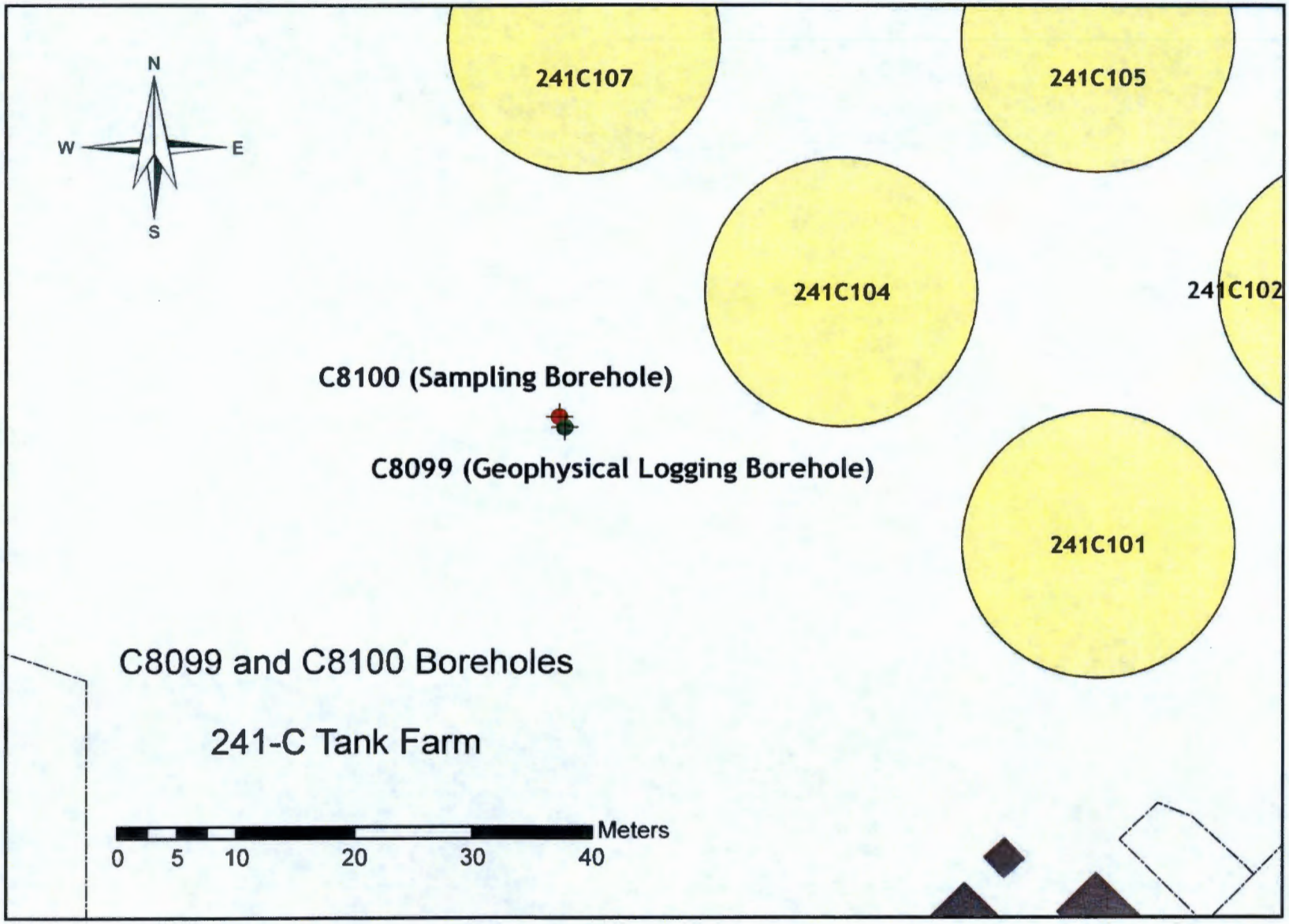
N
W
E
S
241C107
241C105
241C104
241C102
C8100 (Sampling Borehole)
C8099 (Geophysical Logging Borehole)
241C101
C8099 and C8100 Boreholes
241-C Tank Farm
Meters
0
5
10
20
30
40

C8100	136515.1	575116.2	202.198
C8099	136514.2	575116.6	202.378

APPENDIX C

DRILLING AND SAMPLING DAILY WORK RECORDS

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Attend pre-job. Mobilize into farm and begin setting steel plate.		**DATE:** 12-27-10
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 01

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.	NA	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	NA	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Slips, trips, falls
0630	Travel to 'C' farm
0700	Stand-by for pre-job
0800	Pre-job for BY Logging (no package for 'C' farm single package)
	stand-by for package
1130	Lunch
1200	Continue stand-by for package
1530	End of shift
	NA

OPERATOR/LICENSE: Amos/ *ES SUPPORT:* Olson, Repko *NCO:* Stook, Ulkreal *HPT:* Templeton, Bucknard *FWS:* Clark	**WEATHER:** 45 F, Showers **DOWNTIME:** 9 hr for work-package	**DISCARDED ITEMS:** NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Kelly Olson	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Kelly Olson	**SIGNATURE:** David E Skoglie **DATE:** 12/29/10

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Attend pre-job. Mobilize into farm and begin setting steel plate.		**DATE:** 12-28-10
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 02

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes* (No)	*HHU CASE#1 HHU CAT #2* (*HHUXL#3*)

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # _____	*Tubing (*	*) @*	*to*	*ft bgs: S.U.* ____
Borehole # _____	*Tubing (*	*) @*	*to*	*ft bgs: S.U.* ____
Borehole # _____	*Tubing (*	*) @*	*to*	*ft bgs: S.U.* ____

N/A

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Courtesy And Safe Driving.
0900	AT C-Farm, waiting for Prejob
0900	Bill clark is in the Hospital this morning, waiting for direction (?)
0900	Prejob for By - Clark is back on site giving prejob
0910	Prejob on C-104 - clark + Davis on site
0955	End Prejob, waiting for construction supervisor (Dave moore) To do a walkdown of hole
1015	Enter C-Farm to locate hole
1030	Need to relocate Angle hole, Mike walkup will call mike Porsey
1100	Porsey will be out Tomorrow morning (lunch)
1130	waiting to locate hole
1530	End shift

N/A

OPERATOR/LICENSE: Amos/ 1224 *ES SUPPORT:* ~~Weakley~~ Walkup *NCO:* ~~Sharp~~, Snook *HPT:* Templeton, *FWS:* Clark	**WEATHER:** 47 F. Mostly cloudy, winds from the south at 10-15 mph and higher gusts. **DOWNTIME:** Down for Prejob 2 hrs. Down waiting to locate hole 6 hrs.	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 12/29/10

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Mobilize into farm and begin setting steel plate. Re-stake angle hole.		**DATE:** 12-29-10
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 03

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2* (HHUXL#3)

Sample #'s Interval %

1. 2. 3. 4. } N/A

BOREHOLE SUMMARY

Borehole # ~~C8099~~ C8099 ME *Tubing ( ) @ to ft bgs: S.U.* ____

Borehole # N/A *Tubing ( ) @ to ft bgs: S.U.* ____

Borehole # N/A *Tubing ( ) @ to ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Boring # Interval Type

1. 2. 3. } N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: How To Read A MSDS.
0615	LEAVE OFFICE FOR ACE-STATION - C-FARM.
0645	ON SITE AT MO-524, STAND BY FOR PRE-JOB
0720	G. DAVIS (FWS) ON SITE
0740	RCT'S ON-SITE, PRE-JOB BY G. DAVIS.
—	WAITING FOR M. DORSEY RE-SURVEY (STAKE) C8099 ANGLE
—	PUSH HOLE. DUE TO CONSTRUCTION ACTIVITIES.
0900	M. DORSEY ON SITE FOR PRE-JOB, WAITING FOR (CHANGE TRAILER KEY)
0940	DRESS AND ENTER FARM, RE-STAKE C8099. NOTICED
—	ITEMS IN WORK AREA FROM CONSTRUCTION, THAT WILL NEED
—	TO BE MOVED, BEFORE WE PROCEED WITH ANGLE PUSH C8099.
1010	EXIT FARM, STAND BY UNTIL ITEMS FROM CONSTRUCTION ARE
—	MOVED. SECURE WORK AREA & CARGO TRAILER
1210	LEAVING C-FARM, MO524 FOR OFFICE, COMPLETE PAPER
—	WORK, TIME CARDS.
1530	END OF SHIFT.

NOT USED ME

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT: Weakley, Ehrgott* *NCO:* SWOOK, VILLARREAL *HPT:* TEMPLETON, BARNARD *FWS:* Clark (Davis)	**WEATHER:** 39 F. Mostly cloudy with rain and snow showers. Winds from the southwest at 5-10 mph. **DOWNTIME:** 2 HR 55 MIN: WAITING FOR PRE-JOB & KEY TO CHANGE TRAILER • 5 HR 35 MIN: STANDBY FOR ANGLE	**DISCARDED ITEMS:** NONE

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: MIKE EHRGOTT	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Mike Ehrgott	**SIGNATURE:** David E. Skoglie **DATE:** 12/31/10

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 12-30-10
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 04

START CARD NO. SE08643	**DECOMMISSION NO. AE11450**	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

Sample #'s Interval %

1. 2. 3. 4. } N/A

BOREHOLE SUMMARY

Borehole # C8099 *Tubing (* *)@* *to* *ft bgs: S.U.* ____

Borehole # N/A *Tubing (* *)@* *to* *ft bgs: S.U.* ____

Borehole # N/A *Tubing (* *)@* *to* *ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Boring # *Interval* *Type*

1. 2. 3. } N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Pedestrian Crossing.
0615	TRAVEL TO C-FARM MO-524
0645	ARRIVE AT MO-524, NO HPT AT ACE-STATION C-FARM.
—	TRAVEL TO SMURF TO ACE-IN.
0725	ARRIVE BACK AT MO 524. STANDBY FOR PRE-JOB
0735	NCO TRAVEL TO SMURF FOR "WORK PACKAGES"
0750	G. DAVIS, RCT'S ON SITE WITH NCO & WORK PACKAGES,
—	ON STANDBY FOR C-FARM ANGLE PUSH WORK, DUE
—	TO CONSTRUCTION EQUIPMENT IN THE WAY.
—	C-FARM ES CREW TO SUPPORT BY-FARM VADOSE WORK.
1425	TRAVEL TO OFFICE. COMPLETE PAPER WORK, TIMECARD.
1530	END OF SHIFT

NOT USED N/A

ME

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT: Weakley, Ehrgott* *NCO:* SWOOK, VILLAREAL *HPT:* TEMPLETON, BARNARD *FWS:* ~~Clark~~/Davis	**WEATHER:** 32 F. Mostly sunny. Winds from the west at 5-10 mph. **DOWNTIME:** 9 HRS STANDBY	**DISCARDED ITEMS:** NONE

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: MIKE EHRGOTT **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Mike Ehrgott	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 12/31/10

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 01-03-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 05
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

N/A

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Flashing Yellow.
0700	AT C Farm, waiting for prejob
0800	No Activity at C Farm today, still waiting for mat. To get moved at The Angle hole location. (waiting on construction forces)
1100	Lunch
1130	Still waiting on construction to move material out of The ~~hole~~ way so we can access ~~And hole~~ set up on the hole
1530	end shift

N/A

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT: Weakley, Ehrgott, Amos* *NCO:* Snook *HPT:* Templeton, Bernard *FWS: Clark Davis*	**WEATHER:** 21 F, mostly cloudy with north winds at less than 10 mph. **DOWNTIME:** 8 hrs. waiting on construction	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: L C Amos	**REVIEWED BY:** D.E. Skuglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: L C Amos	**SIGNATURE:** David Skuglie **DATE:** 1-4-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 01-04-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 06

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.	NA	
3.		
4.		

BOREHOLE SUMMARY

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ NA to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	NA	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Stay Alert!
0700	AT C-Farm, waiting for POD
0800	Glenda on site, hold prejob. (slips, trips, + falls) ladders
0900	Cannot enter the Farm because construction is pumping concrete near our location.
1100	lunch
1130	Still waiting for Farm access.
1530	End shift
	NOTE: Seems to be an issue with the forklift also. Smokes and battery is not charging
	NA

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT: Weakley, Amos* *NCO:* Snook *HPT:* Templeton and Bernard *FWS: Clark/Davis*	**WEATHER:** 24 F, partly cloudy with light and variable winds. **DOWNTIME:** 8hrs. down due to construction	**DISCARDED ITEMS:** NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Ames	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David Skoglie **DATE:** 1/4/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 1/5/11
LOCATION: *C – Tank Farm 200 West Area Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #:** 10275349	**REPORT #:** 07
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601.Rev. 5 AHA-10-007 Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes* (No)	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

Borehole # _____ *Tubing (* *)@* N/A *to* *ft bgs: S.U.*

Borehole # - _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Good Hygiene on the job.
0700	AT C Farm waiting for POD
0800	POD at C Farm, waiting for crane to move pump out of the way.
1020	Crew is in C Farm rigging the pump to move it out of the way. (construction)
1100	Enter C Farm to level pad/ Mike Dorsey will be out at 12:00 we will take lunch now.
1130	Dress up to enter zone at C-Farm to set plate foundation
1330	Leveled pad and mike Dorsey relocated Angle hole, and azimuth line stakes
1530	End shift
	NOTE: No Forklift available due to mechanical Problem

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT* ,Ehrgott Weakley,Passey *NCO:* williams, *HPT:* Templeton *FWS Clark/Davis:*	**WEATHER:** 34°F **DOWNTIME:** 3 hrs. down waiting on pod + construction	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos **TITLE :** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 1/6/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 1/6/11
LOCATION: "C – Tank Farm 200 West Area Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #:**10275349	**REPORT #:** 08
START CARD NO.SE08643	**DECOMMISSION NO.** AE11449	**RWP:** CO-601.Rev.5 AHA-10-007 Rev.0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

Sample #'s *Interval* *%*

1. N/A
2.
3.
4.

BOREHOLE SUMMARY

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

Borehole # _____ *Tubing (* *)@* N/A *ft bgs: S.U.*

Borehole # - _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

GEOPHYSICAL LOGGING

Boring # *Interval* *Type*

1.
2.
3.

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Preventing cold stress injuries.
0700	POD for BV,
0800	Glenda arrived with the package, we will discuss moving the plate by hand because we have no fork lift. Kris with Energysolutions is giving a plan to lift the plate by hand and move by cart to location. Still waiting for a diecion on loading plate. Two possibilitys are getting a fork lift or lifting by hand.
0930	waiting on an answer.
1100	Lunch
1130	Still looking for a forklift or solution to moving plate
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT* .Ehrgott Weakley.Passey *NCO:* Villareo *HPT:* Templeton, Bernard *FWS:* Clark/Davis	**WEATHER:** 40°F **DOWNTIME:** 8 hrs. down	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035;ECN-10-001557

REPORT BY: Olin Amos **TITLE :** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 1/10/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.		**DATE:** 01-~~04~~ 10-11 DES
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #**10275349	**REPORT #:** ~~06~~ 09 DEA
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 **AHA**-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.		
3.	NA	
4.		

BOREHOLE SUMMARY

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.* ____

Borehole # _____ *Tubing (* *)@* NA *to* *ft bgs: S.U.* ____

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.		
2.	NA	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Quarterly Safety Meeting At Sterlings. Discussed 4-man lift Technics.
0800	AT C-Farm waiting for POD. Direction was given to us by Bill clark not to preform 4-man lift that was planned and practiced. We are waiting to get a forklift to make the lift. Glenda has a forklift we can have tomorrow morning. We will wait for it.
1100	Lunch
1130	waiting for forklift. We stay plan on one in the morning
1530	End shift
	NA

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup, Ehrgott, Passey* *NCO:* Snooks *HPT:* Templeton, Dornord *FWS: Clark/Davis*	**WEATHER:** 31 F, partly cloudy with light and variable winds. **DOWNTIME:** 7hrs. down due to no forklift	**DISCARDED ITEMS:** NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: O Li Ames	**SIGNATURE:** David E. Skoglie **DATE:** 01/11/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly mobilize HHUXL into farm and begin set-up of angle plate.

DATE: 01-11-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 10

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 5 AHA-10-007, Rev. 0

SAMPLING SUMMARY

Sample #'s Interval %

1.
2. NA
3.
4.

SITE/EQUIPMENT INSPECTION: (Yes) No

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C-8099 *Tubing (* 2½" *)@* 0 *to* \ *ft bgs; S.U.* \

Borehole # \ *Tubing (* \ *)@* \ *to* \ *ft bgs; S.U.* \

Borehole # \ *Tubing (* \ *)@* \ *to* \ *ft bgs; S.U.* \

GEOPHYSICAL LOGGING

Boring # Interval Type

1. NA
2.
3.

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: General Safety---Attitude And Behavior.
0630	Travel to 'C' farm, Acc in at Acc station
0715	Stand-by for Pre-job
0800	Pre-job
0815	Stand-by for fork-lift
1000	Fork-lift arrives, Move rig int RMA/RBA, dress into whites,
\	move angle plate, forklift and Rig #3 into 'C' farm,
\	unload and place plate into position, level plate, begin
\	zone set-up.
1145	lunch
1215	Enter farm, finish zone set-up, Drove four nails
	and anchored angle plate; move rig onto plastic,
	clean-up and survey out
1430	Travel to office, paperwork, time cards
1530	End of shift
	NA

OPERATOR/LICENSE: Olson/1217
ES SUPPORT: Weakley, Walkup, Ehrgott
NCO: Smoky, U: Hereel, Williams
HPT: Templeton, Barnard
FWS: Clark/Davis

WEATHER: 27 F, mostly cloudy with a chance of rain/snow mix. Winds from the north at 5-10 mph.

DOWNTIME: .75 hr for pre job
1.75 hr for forklift

DISCARDED ITEMS: NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Kelly Olson
TITLE : *ES TECHNICAL PREPARER*
SIGNATURE: Kelly Olson

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 1/12/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete set-up of angle plate and HHUXL on probe hole #C8099.		**DATE:** 01-12-11
LOCATION: "C" Tank Farm. 200 East Area. Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 11
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 5 AHA-10-007, Rev. 0
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes No*	*HHU CASE#1 HHU CAT #2 HHUXL#3*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	NA	
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 0 to 31.1 ft bgs: S.U. 3.2

Borehole # _____ Tubing ( ) @ NA ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	NA	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Review RWP CO-601, Rev. 5 with WRPS Rad-Con personnel at pre-job at MO 524.
0700	AT C-Farm waiting for POD
0745	POD begins, Go over RWP & Standing orders, dislikes, Likes RCT required in Farm at this time
0815	Go Ace in
0830	Dress into c-Farm and set up XL
1030	Set up and ready to push, Lunch, Re. Ace to new RWP
1100	waiting for review of the RWP change.
1105	Glenda arrived and gave review of RWP. Dress into c Farm and begin pushing Angle hole
1240	Down to 31.1 feet below ground surface with the 2.5" rods. The angle is reading 59.8 on the electronic gauge and 60° on the mechanical gauge, deviated to the west about 1/4" after the third rod was driven. Randy will run the Geo probe in the morning
1315	head to office
1530	End shift

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup, Ehrgott* *NCO:* Snooks, [illegible] *HPT:* Templeton, Bernard *FWS: Davis*	**WEATHER:** 37 F, mostly cloudy with a chance of rain/freezing rain mix. Winds from the south at 5-10 mph. **DOWNTIME:** 1 hrs. POD	**DISCARDED ITEMS:** 8-Rods out of Rack 1 in The hole

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Ames	**SIGNATURE:** David E. Skoglie **DATE:** 1/13/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: PNG run 1st gyro in probe hole #C8099.		DATE: 01-13-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	EXCAVATION: DAN-11-0004287 U-DIG #10275349	REPORT #: 12
START CARD NO. SE08643	DECOMMISSION NO. AE11450	RWP: CO-601, Rev. 6 AHA-10-007, Rev. 1

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

NA

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 31.1 to — ft bgs: S.U. 3.2

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

NA

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Review JHA-10-007 REV. 1 with WRPS FWS in pre-job at farm.
0700	AT C-Farm waiting for POD / Randy Price will run Gyro today
0800	POD on today activities, Emergency notifications to crews inside farm, JHA Review. Trying to determine the best way to communicate Emergency's to crew.
0855	Randy Price is onsite to run Gyro
~~1000~~	Dress into C Farm to help Randy run Gyro
1100	Exit Farm Gyro complete. (Lunch)
1130	Waiting for Gyro information before advancing rods
1530	End shift

NA

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO: Snooks, 1234
HPT: Templeton, Bernard
FWS: Davis *PNG:* Price

WEATHER: 42 F, cloudy with rain throughout the day. Winds from the west at 5-10 mph.

DOWNTIME:
2 hrs. POD
4 hrs. Gyro Info

DISCARDED ITEMS:

NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Ames

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David Skoglie **DATE:** 1/14/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Advance probe hole #C8099 to next gyro interval at 60.0' bgs.		**DATE:** 01-14-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 13

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 6 AHA-10-007, Rev. 1
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8099 Tubing (25) @ 31.1 to — ft bgs: S.U. 3.2

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Review with WRPS personnel temporary plan to communicate with crews in the farm.
0700	AT C Farm, waiting for POD, The Plan is to get all Players together and work out communications
0800	POD, Talking about emergency communications in the Farm. Mike Powers, Liz Morton, Rob Zane, Chris Hutchings on site. The ~~outcome~~ outcome was that there will be no work in the Farm until the headsets come in. There will be no extra man in the Farm for communication purposes due to ARRA concerns, we will regroup on Monday
1100	Lunch
1530	End Shift.
	NOTE: Bill Clark, Glenda Davis, Mike Powers say's no work in Farm until headsets come in.

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup, Zane* *NCO:* Sucoks, 1334 *HPT:* Templeton, Bernard *FWS: Davis* *PNG: Price*	**WEATHER:** 49 F, cloudy with rain throughout the day. Winds from the south at 10-20 mph with higher gusts. **DOWNTIME:** 9hrs. due to communications	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 1/17/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Standby for headsets to come in.		**DATE:** 01-17-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 14

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 6 AHA-10-007, Rev. 1
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 31.1 to — ft bgs: S.U. 3.2

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Continuing 30 Hr. OSHA Training by ESFS Safety Staff. (PPE)
0700	Waiting for headsets to arrive
1100	lunch
1130	waiting for headsets to arrive
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup, Ehrgott
NCO: —
HPT: —
FWS: Davis

WEATHER: 57 F, partly cloudy with winds from the west at 20-30 mph.

DOWNTIME: 9 hrs. waiting for headsets

DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 1/18/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Standby for headsets to come in and receive training.		**DATE:** 01-18-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 15

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 6 AHA-10-007, Rev. 1
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	HHU CASE#1 HHU CAT #2 HHUXL#3

SAMPLING SUMMARY

Sample #'s	Interval	%
1		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8099 Tubing (25) @ 31.1 to 0 ft bgs: S.U. 3.2

Borehole # ___ Tubing (___) @ ___ to ___ ft bgs: S.U. ___

Borehole # ___ Tubing (___) @ ___ to ___ ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: General Safety---Carelessness.
0630	waiting for headsets
1100	Lunch
1130	still waiting on headsets
1300	headsets arrive
1430	headset training
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup, Ehrgott* *NCO:* *HPT:* *FWS: Davis*	**WEATHER:** 47 F, partly cloudy with a chance of rain. Winds from the south at 5-10 mph. **DOWNTIME:** 9 hrs. headsets	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Lc Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: C Lin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 1/20/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Standby for JHA to be re-written.		**DATE: 01-19-11**
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #10275349**	**REPORT #: 16**
START CARD NO. SE08643	**DECOMMISSION NO. AE11450**	**RWP: CO-601, Rev. 6 AHA-10-007, Rev. 1**
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes* (No)	***HHU CASE#1 HHU CAT #2*** (***HHUXL#3***)

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8099 *Tubing* 4½" *) @* N/A *to* 31 *ft bgs: S.U.* 3.2'

Borehole # _____ *Tubing (* *) @* *to* *ft bgs: S.U.* ___

Borehole # _____ *Tubing (* *) @* *to* *ft bgs: S.U.* ___

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	**Safety meeting at office. Topic: Cumulative Trauma Disorders---How Can You Prevent Them?**
0700	Training on headset communications devices with ESFS Safety.
0945	Travel to ENW and test equipment under actual conditions.
0945	Travel to SMURF to attend meeting concerning issues with ESFS and NCO's. Attendees were M. Walkup, G. Davis, B. Clark,
-----	M. Gardner, C. Tabor and H. Sydnor.
1230	Attend meeting at Smurf with ESFS personnel and NCO's.
1330	Travel to office. Complete paperwork and timecard.
1530	End of shift.

N/A

OPERATOR/LICENSE: Ehrgott/3115 *ES SUPPORT: Weakley, Walkup* *NCO:* N/A *HPT:* N/A *FWS: Davis*	**WEATHER: 41 F, partly cloudy with a chance of rain. Winds from the west at 5-10 mph.** **DOWNTIME:** 9 HRS. – JHA REVIEW	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: MIKE WALKUP **TITLE :** *ES TECHNICAL PREPARER* **SIGNATURE:** [signature]	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 01/20/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Standby for JHA to be re-written.

DATE: 01-20-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 17

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 6 AHA-10-007, Rev. 1

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 31.1 to — ft bgs: S.U. 3.2

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Seven-Tenths of a Second.
0700	Head to Smith building for Headset meeting
1100	Lunch (meeting was from 7:30 to 9:00)
1130	waiting for AJHA to be completed to start work
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO:
HPT:
FWS: Davis

N/A

WEATHER: 40 F, partly cloudy with a chance of rain. Winds from the southwest at 5-10 mph.

DOWNTIME: 9 hrs. Paperwork

DISCARDED ITEMS:

N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 01/20/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Stand-by for JHA to be re-written.		**DATE:** 1/24/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #:10275349	**REPORT #:** 18
START CARD NO.SE08643	**DECOMMISSION NO. AE11450**	**RWP:** CO-601.Rev. 6 AHA-10-007 Rev.1
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

Sample #'s Interval %

1. N/A
2.
3.
4.

BOREHOLE SUMMARY

Borehole # C8099 *Tubing (* 2.5 *)@* 31.1 *to* — *ft bgs: S.U.* 3.2

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

Borehole # - _____ *Tubing (* *)@* *to* *ft bgs: S.U.*

GEOPHYSICAL LOGGING

Borng # *Interval* *Type*

1. N/A
2.
3

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Safety and Saving Time.
0700	Head to C Farm to move the trailer out of the
	way. Still waiting on JSA to restart work
1100	lunch
1130	waiting for JSA to be reviewed
1530	End shift

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT* .Ehrgott,Weakley *NCO:* *HPT:* *FWS:* Clark/Davis	**WEATHER:** 45 F, partly cloudy **DOWNTIME:** 9hrs. JSA	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Olin Amos **TITLE :** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E Skoglie **DATE:** 1/24/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Attend pre-job. Continue angle push #C8099.		**DATE:** 01-25-11
LOCATION: "C" Tank Farm. 200 East Area. Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 19

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 6 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.	NA	
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 31.1 to 59.98 ft bgs: S.U. 2.32

Borehole # — Tubing ( ) @ to ft bgs: S.U. —

Borehole # — Tubing ( ) @ to ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	NA	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Everyone Is Responsible For Safety.
0815	Head to C-Farm
0640	AT C-Farm waiting for POD
0900	POD, Glenda is going over JSA, RWP, work to be done
0830	Acc into farm, waiting RWP update
0905	Enter farm and push rod to 59.98'
1010	AT 59.98 with rods, exit zone
1030	out of zone waiting for Randy to run Gyro.
1100	Lunch
1130	waiting for Randy
1230	Randy on site, but C Farm is shut down due to waste Transfer.
1530	End shift
	NOTE: Down due to waste transfer in C-Farm until further notice.
	NA

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snook, Salvez *HPT:* Templeton, Bernard *FWS: Davis*	**WEATHER:** 50 F, partly cloudy with winds from the south at 0-5 mph. **DOWNTIME:** 1.0 - wait Randy 1.5 hrs. POD 3.0 hrs. waste Transfer	**DISCARDED ITEMS:** NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 1/26/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Run gyro in #C8099 and drive to next gyro interval at 68.06' bgs. **DATE:** 01-26-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford | **EXCAVATION:** DAN-11-0004287, U-DIG #10275349 | **REPORT #:** 20

START CARD NO. SE08643 | **DECOMMISSION NO.** AE11450 | **RWP:** CO-601, Rev. 7 AHA-10-007, Rev. 2

SAMPLING SUMMARY

Sample #'s	Interval	%
1.	N/A	
2.		
3.		
4.		

SITE/EQUIPMENT INSPECTION: Yes (No) | *HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 59.98 to — ft bgs: S.U. 2.32

Borehole # — Tubing ( ) @ to ft bgs: S.U. —

Borehole # — Tubing ( ) @ to ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Lift It Twice.
0615	head to C-Farm
0645	AT C-Farm, waiting for POD
0800	Glenda on site, POD discussed Stop work Authority, gyro logging.
0804	Randy on site, Ace into C-Farm, Enter to Gyro hole
1000	Exit Farm, Gyro is not working, Survey Randy's equipment out of the Farm so he can work on it. Randy will take tooling to Town and check out.
1100	Lunch
1130	wait for Randy to fix the gyro.
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO: Snooks, Williams
HPT: Templeton, Bernard
FWS: Davis

WEATHER: 46 F, partly cloudy with winds from the north at 5-10 mph.

DOWNTIME: 1 hr. POD, 5 hrs. Randy

DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Ames

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David Skoglie **DATE:** 1/26/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Standby for PNG to repair gyro.		DATE: 01-27-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	EXCAVATION: DAN-11-0004287 U-DIG #10275349	REPORT #: 21
START CARD NO. SE08643	DECOMMISSION NO. AE11450	RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: Yes (No)	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8099 Tubing ( ) @ 59.98 to ft bgs: S.U 2.32

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Portable Abrasive Wheels.
0700	waiting on Gyro
1100	Lunch
1130	waiting on Gyro
1530	End shift
	NOTE: Gyro may be fixed for Tomorrow

N/A

OPERATOR/LICENSE: Amos/1224 ES SUPPORT: Weakley, Walkup NCO: HPT: N/A FWS: Davis	WEATHER: 42 F, partly cloudy with winds from the northwest at 5-10 mph. DOWNTIME: 8 hrs. Down on Gyro	DISCARDED ITEMS:

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	REVIEWED BY: D.E. Skoglie
TITLE: ES TECHNICAL PREPARER	TITLE: ES TECHNICAL REVIEWER
SIGNATURE: Olin Amos	SIGNATURE: David E. Skoglie DATE: 1/28/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: PNG run gyro at 2nd interval in #C8099.		**DATE:** 01-28-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 22

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

Sample #'s	Interval	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 59.98 to — ft bgs; S.U. 2.32

Borehole # — Tubing ( ) @ to ft bgs; S.U.

Borehole # — Tubing ( ) @ to ft bgs; S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: General Safety---A Single Second.
0700	AT C-Farm, waiting for POD
0730	Randy on site, waiting POD
0813	RCT and everyone on site, Hold POD
0830	Randy, Roney, weakley, & Amos enters C-Farm to run Gyro from 0 To 56.58'
1015	Gyro completed successful. Exit Farm
1040	out of Farm await Gyro Data.
1100	lunch
1130	waiting on Gyro information to continue driving pipe.
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Walkup *NCO:* Salvae, Williams *HPT:* Templeton, Bernard *FWS:* Simons	**WEATHER:** 40 F, cloudy with early morning fog. Winds from the south at 5-10 mph. **DOWNTIME:** 1.0 POD 4.0 hrs Gyro	**DISCARDED ITEMS:**

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 1/31/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Drive to 3rd interval. PNG run gyro in #C8099.		DATE: 01-31-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	EXCAVATION: DAN-11-0004287 U-DIG #10275349	REPORT #: 23
START CARD NO. SE08643	DECOMMISSION NO. AE11450	RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: (Yes) No	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	NA	
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing ( ) @ 58.98 to 68.06 ft bgs: S.U. 2.24

Borehole # — Tubing ( ) @ — to — ft bgs: S.U. —

Borehole # — Tubing ( ) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	NA	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Continuing 30 Hr. OSHA Training by ESFS Safety Staff.
0700	AT C-Farm waiting for POD
0810	POD, watch hillside, push to 68.06 and run Gyro
0910	Pushed to 68.06. Exit Farm, waiting on Randy to enter Farm and Gyro
0945	Enter C-Farm with Randy and Rory to help set up for Gyro
1015	Running Gyro NOTE: Got word that we will have to lock-out the rig to replace lynch pins.
11:35	Done with Gyro, Exit Farm.
12:00	Lunch
12:30	Waiting for results from Gyro.
1530	End Shift
	NA

OPERATOR/LICENSE: Amos/1224 ES SUPPORT: Weakley, Walkup NCO: Sharp, Williams HPT: Templeton, Bernard FWS: Simons	WEATHER: 31 F, mostly sunny and cold. Winds from the north at 5-15 mph. DOWNTIME: 1 hr. POD 5.5 hrs. Gyro	DISCARDED ITEMS: 1 lynch pin

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	REVIEWED BY: D.E. Skoglie
TITLE: ES TECHNICAL PREPARER	TITLE: ES TECHNICAL REVIEWER
SIGNATURE: Olin Amos	SIGNATURE: David E. Skoglie DATE: 2/1/11

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ENERGYSOLUTIONS

ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Begin driving #C8099 towards T.D.

DATE: 02-01-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 24

START CARD NO. SF08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2

SAMPLING SUMMARY

SITE/EQUIPMENT INSPECTION: (Yes) No

HHIU CASE#1 HHIU CAT #2 (HHUXL#3)

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 68.06 to 150.3 ft bgs: S.U. 4.0

Borehole # — Tubing ( ) @ — to — ft bgs: S.U. —

Borehole # — Tubing ( ) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: General Safety---Attitude And Behavior.
0700	AT C-Farm, waiting for POD, (hrs 429.7 on Rig)
0800	POD, discussed Lock + Tag, SHA
0830	Enter site and push 2 rods
0900	out of rods, waiting for electrician
0930	Found electrician to go in with us to pull rods out of Danger Zone (SGE). Begin driving rods
1115	Exit Farm
1130	Lunch
1200	waiting for operator to open change trailer
1230	Enter Farm and push to 150.3
1340	Pack rods out of SGE Danger area.
1415	Exit Farm
1440	Head to office
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Wilkup
NCO: Snook, Williams, Salvador
HPT: Templeton, Barnard
FWS: Simons

WEATHER: 30 F, mostly sunny and cold. Winds light and variable.

DOWNTIME:
1 hr - POD
.5 - wait on key (NCO)

DISCARDED ITEMS:

N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 2/2/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue driving #C8099 towards T.D.

DATE: 02-02-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 25

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2

SITE/EQUIPMENT INSPECTION: (Yes) No

HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.	N/A	
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 150 to 218 ft bgs: S.U. 0

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Begin preparing desktop instructions for HHU's with ESFS safety.
0700	AT C-Farm, waiting for POD
0800	POD, (JHA, RWP, Todays Activities were the subject)
0830	Enter Farm and push rods
1100	Lunch, Rod # 48 is on. Finish pushing it in after Lunch
1200	Lunch over
1210	In Farm and push Rods
1345	out of Farm, at 218" bgs. Rod #54 To ground level.
1350	Move Pipe To sight. (Enter Farm).
1410	Leave for office.
1445	To office
1530	end of Day

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup, Passey
NCO: Snoek, Williams, Villarreal
HPT: Templeton, Barnard
FWS: Simons

WEATHER: 33 F, mostly sunny and cold. Winds from the north at 5-10 mph.

DOWNTIME: 1 hr. POD

DISCARDED ITEMS:
Rock # 1 had 53 (2.5)
Discard 1 for Thread
Rock # 3 Pulled 9 Pipe.

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: David E. Skoglie **DATE:** 2/3/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue driving #C8099 towards T.D. PNG possibly run gyro.		**DATE:** 02-03-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 26
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

Sample #'s Interval %

1. NA
2.
3.
4.

BOREHOLE SUMMARY

Borehole # C8099 *Tubing (* 2.5 *) @* 218 *to* 256.3 *ft bgs: S.U.* ____

Borehole # ____ *Tubing ( ) @ to ft bgs: S.U.* ____

Borehole # ____ *Tubing ( ) @ to ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Boring # Interval Type

1. NA
2.
3.

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Tricks Of The Trade.
0700	AT C-Farm, waiting for POD
0800	POD, Simons on site discuss JHA, RWP, work for the day.
0815	Enter Farm drive pipe. (Proposed TD is 256.3)
1040	Break (Randy Price on site to run Gyro when we TD)
1100	Back in farm push rods (rods pushing very hard)
1200	Rods at 256.3, ready to run gyro. Exit Farm
1230	Lunch
1300	Randy Price called off on Gyro due to not enough time left will log gyro on Monday.
	NOTE: locked out rig for lynch pin replacement at 10:05
	Back drilling at 1040
1530	End shift
	NA

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Walkup *NCO:* ~~Shamp~~ Snoots, Zeay *HPT:* Templeton, Bernard *FWS:* Simons *PNG—Price*	**WEATHER:** 36 F, partly cloudy with light and variable winds. **DOWNTIME:** 1 hr. POD 3 hrs. wait on Gyro	**DISCARDED ITEMS:** 3 Lynch Pins

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Ames	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E Skoglie **DATE:** 2/4/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: PNG/ESFS run gyro and possibly begin moisture logging #C8099.		**DATE:** 02-07-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #**10275349	**REPORT #:** 27
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

NA

BOREHOLE SUMMARY

Borehole # C8099	Tubing ( ) @	to	ft bgs: S.U. ___
Borehole # ___	Tubing ( ) @	to	ft bgs: S.U. ___
Borehole # ___	Tubing ( ) @	to	ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1. C8099	255'-0'	Moisture
2.		
3.		

TIME	WORK SUMMARY
0600	**Safety meeting at office. Topic: General Safety---Signs.**
0720	Arrive at C Farm. No support personel on site yet. No PNG support.
0820	PNG support arrived.
0825	P.O.D meeting. Gyro C8099. HPTs to tag hole before proceeding.
0840	Enter farm + set up Gyro on C8099. Performed a test run to see if gyro would go to total depth, after HPT Bernard swabbed and surveyed borehole. Gyro would not proceed past 176'. Warmed Gyro and proceeded to do 4 runs to 173'.
1200	Exited farm. Lunch.
1230	Gathered equipment to commence with moisture logging. Missing a cord from the cart. Randy left the site to retrieve missing cord.
1325	Re-enter farm for moisture logging.
1410	Begun moisture logging on C8099 at 255'.
2100	Moisture logging complete.
2145	Left site. Not enough time to start gamma logging. Also, extremely low on fuel in generators.
2230	End of shift.

NA

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT:* ~~Bassey~~ Steffler *NCO:* Snook, Jizzy, Williams *HPT:* Jeff, Bernard *FWS:* Simons *PNG* Price	**WEATHER:** 52 F, partly cloudy with winds from the southwest at 15-35 mph. Gusts to 45 mph. **DOWNTIME:** 1 hr. Waiting for support	**DISCARDED ITEMS:** None

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: RZ Steffler	**REVIEWED BY:** D.E Skoglie
TITLE.: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: R.Z. Steffler	**SIGNATURE:** David E. Skoglie **DATE:** 2/8/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: PNG/ESFS begin gamma logging in #C8099. Day and swing shifts.		DATE: 02-08-11
LOCATION: "C" Tank Farm. 200 East Area, Hanford	EXCAVATION: DAN-11-0004287 U-DIG #10275349	REPORT #: 28
START CARD NO. SE08643	DECOMMISSION NO. AE11450	RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: (Yes) No	HHU CASE#1 HHU CAT #2 (HHUXL#3)

Sample #'s	Interval	%
1.	NA	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1. C8099	255' - 183'	Gamma
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Don't Neglect Cuts.
0720	On Site. Waiting for support and P.O.P. meeting.
0830	P.O.P meeting. Possible waste transfer issues.
0900	Enter Farm. Fuel generators and begin logging C8099, beginning @ 255'.
1430	Exited farm. Gamma logged C8099 from 255' to 183'.
1515	Returned to office. Swing shift canceled due to waste transfer in C farm.

NA

OPERATOR/LICENSE: Walkup/3005 ES SUPPORT: Passey, Steffler NCO: Mike Robbert HPT: Bernard, Templeton FWS: Simons PNG—Price	WEATHER: 42 F, mostly cloudy with mixed rain/snow. Winds from the northwest at 5-15 mph. DOWNTIME: 1.25 hrs. Wait for P.O.P.	DISCARDED ITEMS: None

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: RZ Steffler	REVIEWED BY:
TITLE: ES TECHNICAL PREPARER	TITLE: ES TECHNICAL REVIEWER
SIGNATURE: RZ Steffler	SIGNATURE: _____ DATE: _____

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: PNG/ESFS continue gamma logging in #C8099. Day and possibly swing shifts.	**DATE: 02-09-11**
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #10275349**
	REPORT #: 29

START CARD NO. SE08643	**DECOMMISSION NO. AE11450**	**RWP: CO-601, Rev. 7 AHA-10-007, Rev. 2**
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	***HHU CASE#1 HHU CAT #2 (HHUXL#3)***

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

NA

BOREHOLE SUMMARY

Borehole # _____	Tubing ( ) @	to	ft bgs: S.U. ____	
Borehole # _____	Tubing ( ) @	to	ft bgs: S.U. ____	
Borehole # _____	Tubing ( ) @	to	ft bgs: S.U. ____	

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1. C8099	184 – 0	Gamma
2.		
3.		

TIME	WORK SUMMARY
0600	**Safety meeting at office. Topic: Job Site Heating Devices.**
0700	Arrive on site. Set up routers + communication equipment.
0800	FWS arrives. P.O.D. meeting. Waste transfer still commencing, but won't affect logging.
0900	Begun logging C8099.
0910	Computers not communicating. No signal inside trailer
0920	Exited farm.
0935	Enter farm. Reestablish communication.
0945	Exit farm. Communication dropped again.
1020	Logging continues. Randy coming out to investigate communication problems.
1200	Randy arrives. Unable to figure out communication problem. Suspect that waste transfer electronics may be interfering. Continue to check logging unit periodically.
2100	Gamma Logging on C8099 Complete.
2140	Equipment Surveyed from farm. No contamination.
2230	Returned to office.

NA

OPERATOR/LICENSE: Walkup/3005 *ES SUPPORT: Passey, Steffler* *NCO:* Snook, Izzy, Robbert *HPT:* Templeton, Bernard *FWS:* Davis *PNG* Price	**WEATHER: 44 F, mostly with winds from the southwest at 5-10 mph.** **DOWNTIME:** 1 Hr. for P.O.D meeting	**DISCARDED ITEMS:** None

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: RZ Steffler	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: R.Z. Steffler	**SIGNATURE:** David E. Skoglie **DATE:** 2/10/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Decommission #C8099 from 256.0' bgs to 222.0' bgs.		**DATE:** 02-10-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 30
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No 456.6 hrs.	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

Sample #'s	Interval	%
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 256.3 to 221.3 ft bgs: S.U. 3

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Job Training Is A Must.
0700	AT C-Farm waiting for POD
0750	POD. discuss pulling pipe and knocking out tip.
	An operator is required when back pulling rods.
	Pickup knocker bar at B-V Farm after its surveid
0907	Enter Farm to pull 2.5" and knock out tip
1045	Tip out, pull rod to 221.3 with 3' of stkup. Rod #55
	showing. Exit Farm
1100	lunch
1130	Head to office for Sonar representative to demo
	tar mafs
1530	End shift

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snooks *HPT:* Templeton, Clayton *FWS: Simons*	**WEATHER:** 45 F, partly cloudy with winds from the southwest at 5-10 mph. **DOWNTIME:**	**DISCARDED ITEMS:** 1-Bag Bentonite 1- 2.5" Tip

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Ames	**SIGNATURE:** Dave Skoglie **DATE:** 2/11/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Possibly begin probe installation and decommissioning of #C8099.		**DATE:** 02-11-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 31

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample # 's	Interval	%
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 221.3 to – ft bgs: S.U. 3

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Fall Causes.
0700	AT 200 East, C-Farm, waiting for POD
0730	Notified that the NCO's have a meeting until 9:30. Decide To get probes taped up and ready. Still waiting on probe depth as well.
0913	back at C-Farm, waiting for support personnel to arrive.
1045	Mike walkup called and said the first probe will be set at 171' BGS. Still waiting on Support (NCOs)
1100	lunch
1130	Still waiting for support, no support today
1430	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Snooks, Izzy *HPT:* Templeton *FWS:* Simons	**WEATHER:** 51 F, partly cloudy and mild. Winds will be light and variable. **DOWNTIME:** 7 hrs. no support	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 2/14/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue probe installation and decommissioning of #C8099.		**DATE:** 02-14-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 32

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8099 Tubing ( ) @ 221.8 to 91.3 ft bgs: S.U. 3.

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Clothing For Construction.
0650	AT C-Farm waiting for POD
0830	RCT's and NCO's AT Trailer, hold POD
0845	Enter Farm and pull back pipe to probe depth 171'
	Place bentonite and Sand and diatomitearth and water.
	1st Trammie pipe set during Lunch, Exit Farm
1045	Lunch
1115	waiting for NCO's to open Farm
1200	Enter Farm and pull rods to next probe depth, while adding bentonite.
1330	Set 2nd Probe AT 102', Added Sand Diatomite and water
	Pull Trammie pipe out and ready to pull pipe (AM)
1430	Exit Farm,
1445	Head to office.
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Walkup *NCO:* Snooks, Rivera *HPT:* Templeton, Bernard *FWS:* Simons	**WEATHER:** 59 F, mostly cloudy with a chance of showers. Winds from the south at 5-15 mph. **DOWNTIME:** 1.5 waiting on Support POD .5 waiting on NCO's	**DISCARDED ITEMS:** 1 - 220' Probe 1 - 160' Probe 5 - Bags Bentonite 1 - Bag Sand, 1 Bag Diatomite

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 02-14-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue with Decommissioning of #C8099 | **DATE:** 2/15/11

LOCATION: "C" – Tank Farm 200 West Area Hanford | **EXCAVATION:** DAN-11-0004287, U-DIG #:10275349 | **REPORT #:** 33

START CARD NO.SE08643 | **DECOMMISSION NO. AE11450** | **RWP:** CO-601.Rev. 8 AHA-10-007 Rev.2

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.	N/A	
3.		
4.		

SITE/EQUIPMENT INSPECTION: (Yes) No | HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2½") @ 91' bgs to 43' bgs ft bgs: S.U. 3.3'

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Ladder Safety Part-1
0625	TRAVEL TO C-FARM MO 524
0700	ARRIVE AT ACE-STATION NEXT TO C-FARM. POWER-
—	OUTAGE 200E AREA (C-FARM)
0715	TRAVEL TO SMURF BUILDING FOR MEETING
0800	PLANNING MEETING FOR C101 (ANGLE PUSH)
~~0820~~	0820 END OF PLANNING MEETING, TRAVEL BACK TO C-FARM
—	ACE-IN NEXT TO C-FARM
0840	ARRIVE AT MO-524, STANDBY FOR G. SIMONS FWS & PRE-JOB.
0930	RCT LEFT FOR SMURF TO PICKUP J. CLAYTON (RCT) FOR SUPPORT
0950	CALLED G. SIMONS FWS TO FIND OUT STATUS PRE-JOB & WORKPACKAGE
—	HE SAID HE WAS LOOKING FOR VEHICLE TO DRIVE TO COMMERCE,
—	AND FOR ME TO CHECK WITH RCTS ON WIND STATUS.
1030	RCT BACK ON SITE, WAITING FOR G. SIMONS, WITH WORKPACKAGE
—	FOR PRE-JOB
1050	GREG SIMONS ON SITE FOR PRE-JOB.
1110	G. Simons Completes PRE-JOB. (HCO's LUNCH 11:00 TO 12:00)
~~1215~~	DRESS & ENTER, INSPECT & FUEL RIG. BACKFILL FROM 91' bgs
—	TO 43' bgs. BENTONITE @ ~ 44' bgs
1330	RCT - SHUT DOWN JOB DUE TO WIND. SECURE SITE & EXIT FARM
1350	TRAVEL TO 2101-HV SURVEY THROUGH PCM. THEN ON TO OFFICE
1430	COMPLETE PAPER WORK AND TIME CARD
1530	END OF SHIFT

OPERATOR/LICENSE: ~~Amos/1224~~ Ailt
ES SUPPORT: Ehrgott, Weakley
NCO: Swook, Villareal
HPT: Barnwell
FWS: Simons

WEATHER: 50 F. partly cloudy
Chance of Rain. WINDY

DOWNTIME: ~~1.50~~ 1.50 HR

DISCARDED ITEMS: 3 BAGS BENTONITE

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: MIKE EHRGOTT
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Mike Ehrgott

REVIEWED BY: D.E. Skoglie
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: David E. Skoglie **DATE:** 2/16/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue with Decommissioning of #C8099		DATE: 2/16/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	EXCAVATION: DAN-11-0004287 U-DIG #:10275349	REPORT #: 34

START CARD NO.SE08643	DECOMMISSION NO. AE11450	RWP: CO-601.Rev. 8 AHA-10-007 Rev.2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: (Yes) No	HHU CASE#1 HHU CAT #2 (HHUXL#3)

Sample #'s Interval %

1. N/A
2.
3.
4.

BOREHOLE SUMMARY

Borehole # C8099 Tubing (2.5) @ 43' to 0 ft bgs: S.U. 0

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

Borehole # N/A Tubing ( ) @ to ft bgs; S.U.

GEOPHYSICAL LOGGING

Boring # Interval Type

1. N/A
2.
3.

TIME	WORK SUMMARY
0600	Safety meeting at office, Topic: Ladder Safety Part-2, Head to C Farm
0700	AT C-Farm waiting for POD
0810	POD Greg on site, finish pulling pipe from 43'. Has to go get key
0830	Enter Farm, do rig inspection, warmup Rig.
0845	Pull Pipe while adding bentonite, pull nails out of Plate, fold rig over and clean up site.
1030	Exit Farm, Mike Dorsey and Mike Ergott enter Farm to locate C8100 and Azmuth point
1140	Dorsey and Ergott out of Farm, was unable to check C8100 location and Azmuth location because work was being done to repeater on Gable Mtn. so mike could not get gps readings.
1200	Lunch
1230	waiting for direction
1300	Enter Zone to do measurements and straight lines to locate sample hole.
1400	Leave Farm and Survey equipment (Tooling) out.
1430	Head to office
1530	End Shift
	N/A

OPERATOR/LICENSE: Amos/1224 ES SUPPORT .Ehrgott,Weakley NCO: Shooks, villiaual HPT: Templeton, Bernard FWS: Simons	WEATHER: 50 F, partly cloudy Chance of Rain. DOWNTIME: 1½hr for P.O.D. .5 hr. for work direction	DISCARDED ITEMS: 4-Bags Bentonite

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Olin Amos TITLE : ES TECHNICAL PREPARER SIGNATURE: Olin Amos	REVIEWED BY: RZ Steffler TITLE: ES TECHNICAL REVIEWER SIGNATURE: R.Z. Steffler DATE: 2-17-11

10/06/09 Rev 1

ENERGYSOLUTIONS

ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Check Alignment and set offsets for C8100 Sample Hole.		**DATE:** 2/17/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #:10275349	**REPORT #:** 35
START CARD NO.SE08643	**DECOMMISSION NO. AE11450**	**RWP:** CO-601.Rev. 8 AHA-10-007 Rev.2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	NA	
4.		

BOREHOLE SUMMARY

Borehole # ___ Tubing ( ) @ to ft bgs: S.U.

Borehole # ___ Tubing ( ) @ to ft bgs: S.U.

Borehole # - ___ Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	NA	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office, Topic: Good Hygiene on the Job.
0700	Head to C Farm
0730	AT C Farm to go in and set reference Points for C 8100
0840	Enter Farm, set 3 Reference Points to Locate C8100 after surface sample is Taken. The 1ST RP is north 4'1". The Second is west of The C 8100 Sample hole 3 foot. The Third is south of C8100 3 feet.
0930	Exit farm. Go to Energy northwest yard to fuel Patches and equipment for The CHPRC job.
1100	Head to office, we will not be able to get The surface sample for C8100 until Tuesday
1130	Lunch
1200	Down, waiting for Surface Sample
	NA

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT* Ehrgott *NCO:* Sparks *HPT:* Templeton, Bernard *FWS:* Simons	**WEATHER:** 50 F, Partly Sunny **DOWNTIME:** 8 hrs. waiting for Surface Sample	**DISCARDED ITEMS:**

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Olin Amos **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** RZ Steffler **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** RZ Steffler **DATE:** 2-17-11

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ENERGYSOLUTIONS

ENERGY SOLUTIONS, WESTERN OPERATIONS Page 1 of 1

DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Obtain surface sample AT C8100 and begin setup | DATE: 02-22-11

LOCATION: "C" Tank Farm, 200 East | EXCAVATION: DAN-110042 U-DIG #: 10275349 | REPORT #: 36

START CARD NO. SE08643 | DECOMMISSION NO. AE 11450 | RWP: CO-601, R.8 AHA-10-007, Rev 2

SAMPLING SUMMARY | SITE/EQUIPMENT INSPECTION: Yes (No) | HHL CASE#1 HHL CAT#2 (HHUXL#3)

Sample = s Interval %

1
2
3
4

NA

BOREHOLE SUMMARY

Borehole = NA Tubing @ ic ft ogs SL
Borehole = Tubing @ ic ft ogs SL
Borehole = Tubing @ ic ft ogs SL

GEOPHYSICAL LOGGING

Boring = Interval Type

1
2
3

NA

TIME	WORK SUMMARY
0600	Saftey meeting at office, Topic: be alerted moving equip.
0645	AT C Farm, waiting for rod
0815	Greg Simons on site, Down due to wind
1000	mike walkup just called and said that due to pump transfer problems in C Farm, There will be no work for a week or so. Called Kelly to see if he needs anything.
1200	lunch
1230	Still down due to wind
1530	End shift

NA

OPERATOR LICENSE: Amos / 1224
ES SUPPORT Weakley
NCO Snook, Zzy
HPT Tepbeton, Bernard
FHS Simons

WEATHER: 47°F mostly cloudy, High winds

DOWNTIME: 8 hrs. down due to wind

DISCARDED ITEMS: NA

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-038; BCN-10-00155

REPORT BY: Olin Amos
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Olin Amos

REVIEWED BY: RZ Steffler
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: R.Z. Steffler

DATE 2-22-11

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Obtain surface sample at #C8100 and begin set up of HHUXL for sample angle hole.

DATE: 02-23-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 37

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 8 **AHA-**10-007, Rev. 2

SITE/EQUIPMENT INSPECTION: *Yes* (No)

HHU CASE#1 *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.	N/A	
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8100 *Tubing (* 2 5/8 *) @* 65 *to* N/A *ft bgs: S.U.* N/A

Borehole # N/A *Tubing ( ) @ to ft bgs: S.U.* ___

Borehole # N/A *Tubing ( ) @ to ft bgs: S.U.* ___

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	**Safety meeting at office. Topic: From Head To Foot.**
0625	Travel to "C" Farm.
0700	Onsite at "C" Farm. Standby for P.O.D.
0815	P.O.D. at "C" Farm by FWS G. Simons.
0830	AOP-008 in effect. Unable to take surface sample.
1100	Lunch.
1130	AOP 008 in effect. ESFS crew on standby.
-----	Travel to office. Complete paperwork and timecard.
1530	End of shift.

N/A

OPERATOR/LICENSE: Walkup/3005
ES SUPPORT: Steffler
NCO: Snook, Villarreal, Campbell
HPT: Crem, Cox
FWS: Simons

WEATHER: 43 F, mostly cloudy and cold with a chance of showers. Winds from the southwest at 5-15 mph.

DOWNTIME: ~~0~~ Hrs.---AOP 008
8

DISCARDED ITEMS:
N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: M. W. Walkup
TITLE : *ES TECHNICAL PREPARER*
SIGNATURE: [signature]

REVIEWED BY: RZ Steffler
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: [signature]
DATE: 2-23-11

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ENERGYSOLUTIONS

ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Obtain surface sample at #C8100 and begin set up of HHUXL for sample angle hole.		DATE: 02-24-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	EXCAVATION: DAN-11-0004287 U-DIG #10275349	REPORT #: 38

START CARD NO. SE08643	DECOMMISSION NO. AE11450	RWP: CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: Yes (No)	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1. B2B1L6	Surface	
2. B2C1L7	Surface Dup	
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 0 to — ft bgs S.U —

Borehole # — Tubing ( ) @ — to — ft bgs S.U —

Borehole # — Tubing ( ) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Housekeeping Is Safe---Keeping At Work.
0700	AT C-Farm waiting for POD
0745	Held POD. Take sample at surface and then go in and set plate
0800	NCO,s Snook and Cambell are going into C-Farm to Take the surface sample on C8100
0850	Samplers are out of Farm, with sample looks good.
0900	Go in and setup plate and rig.
11:10	Exit Farm. Plate has been set and nailed in.
1130	Lunch
1200	To windy to use transit to set up rig.
1300	Head to office
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224 ES SUPPORT: ~~Weakley~~ Walkup, Bryant NCO: Snook, Izzy HPT: Templeton, Bernard FWS: Simons	WEATHER: 31 F, mostly cloudy and cold with a chance of light snow. Winds from the north at 5-15 mph. DOWNTIME: 1 hr. POD 3.5 hrs. due to wind	DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	REVIEWED BY: RZ Steffler
TITLE: ES TECHNICAL PREPARER	TITLE: ES TECHNICAL REVIEWER
SIGNATURE: Olin Ames	SIGNATURE: RZ Steffler DATE: 2-24-11

10/06/09 Rev 1

FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 1	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 Surface		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 2	TOTAL NUMBER OF CHAINS 1	COLLECTOR	

222-S V11-001-001

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1L6	2 / 500mL / Gs		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

FIELD INFORMATION	
WHERE ARE SAMPLES LOCATED AT THIS TIME?	☐ WSCF ☐ 222-S ☐ MO-413 ☐ MO-745 ☐ 6269 ☐ OTHER
CONTAINER/DRUM/TOTE/BOX	
SAMPLE MATRIX DESCRIPTION	☐ SOIL ☐ SLUDGE ☐ RESIN ☐ GAC ☐ FILTER PAPER ☐ OTHER
FURTHER SAMPLE MATRIX EXPLANATION/DESCRIPTION [NOTE ANY ODOR, COLOR, TEXTURE (E.G., SLIMY, OILY, GRANULAR, ETC.)]	
FIELD OBSERVATIONS	
WEATHER	
FIELD COMMENTS	
SUPPORT PERSONNEL	
SAMPLES SURVEYED BY RCT	☐ YES ☐ NO
IS A BLUE CARD REQUIRED	☐ YES ☐ NO BLUE CARD NO
IS SRS PROVIDED AND COMPLETE	☐ YES ☐ NO
RECORDED BY	PRINT NAME / SIGN NAME / DATE
INDEPENDENT REVIEW	PRINT NAME / SIGN NAME / DATE

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ENERGYSOLUTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete set up of HHUXL for sample angle hole #C8100 and drive to 1st sample interval.		**DATE:** 02-25-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 39

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 HHUXL#3*

Sample #'s	Interval	%
1. 020IMO		
2. 020X79	1	5.7to7.7
3. 020X80	2	
4. 020X81	3	

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 0 to 5.7 ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Allergies, Antihistamines & Drowsiness.
0700	on site at C-Farm, waiting for POD
0800	Held POD, Greg is on site, finishing setting up rig and get ready to drive is the topic.
0835	Enter farm and finish setting up. Pull rig (XL) up to plate and shoot in with transit to proper angle.
1015	Exit farm and gather tools needed to drive to sample depth.
1035	Enter zone and get prepare to drive 2 5/8" to sample depth of 5.7 feet. Reddjust rig to get 60° angle. Drive to sample depth and pull dummy tip
1135	Drive sample from 5.7 to 7.7 feet
1145	Pull sample and cap hole, clean up site.
1215	Exit farm
1230	lunch
1300	Pickup materials,
1315	Head to office
1430	End shift

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Ehrgott, Walkup* *NCO:* izzy, williams *HPT:* Templeton, Bernard *FWS: Simons*	**WEATHER:** 25 F, mostly sunny and COLD! Winds from the north at 5-15 mph. **DOWNTIME:** 1.5 POD	**DISCARDED ITEMS:** 3 - liners 6 - Caps DCL

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: LO Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: LO Amos	**SIGNATURE:** Dave Skoglie **DATE:** 2/28/11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		**PAGE** 1 **OF** 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I001		**LOGBOOK NO./PAGE**	
WELL NAME	ORIGINAL	**WELL ID**	**ACTUAL DEPTH** ☐ft ☐m
BOTTOM OF CASING (bgs)	☐ft ☐m	**BOTTOM OF BOREHOLE (bgs)**	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	**TOTAL NUMBER OF CHAINS** 2	**COLLECTOR**	

222-S **V11-001-005**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1M0	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-006**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2BX79	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2BX80	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2BXB1	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

DROVE AT HRS
1135

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100 and possibly run gyro. (PNG)

DATE: 02-28-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 40

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 8 AHA-10-007, Rev. 3

SAMPLING SUMMARY

Sample #'s Interval %

1. N/A
2.
3.
4.

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 5.7 to – ft bgs: S.U. 4.6

Borehole # — Tubing ( ) @ – to – ft bgs: S.U. –

Borehole # — Tubing ( ) @ – to – ft bgs: S.U. –

GEOPHYSICAL LOGGING

Boring # Interval Type

1. N/A
2.
3.

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: What You Don't Know.
0700	AT C-Farm, waiting for POD
0800	POD. No work today because of high winds
1200	Lunch
1530	End Shift

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO: Sacks, Izzy
HPT: Templeton, Bernard
FWS: Simons PNG: Price

WEATHER: 47 F, partly cloudy with a chance of rain showers. Winds from the south at 20-40 mph. Gusts will be in excess of 50 mph.

DOWNTIME:
1 hr. POD
7 hrs. wind

DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: David E. Skoglie **DATE:** 3/1/11

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ENERGYSOLUTIONS

ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100 and possibly run gyro. (PNG)		**DATE:** 03-01-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 41

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. ~~8~~ 7 AHA-10-007, Rev. ~~12~~ 13
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1* *HHU CAT #2* (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1 B20X89	15' to 17'	
2. B20IM1		
3. B20IM2		
4. B20IM3		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 7.7 to 17 ft bgs: S.U. 1.3

Borehole # — Tubing ( ) @ to ft bgs: S.U.

Borehole # — Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Morning Wake Up.
0700	At C Farm, waiting for POD, Glenda Davis and Greg Simons on site. Waiting for RCT's. POD (rain)
0810	Enter Farm, rig inspection, Grease rig, Pull rods back and try to straighten hole. Found out that the bottom 2' Take up joint is bent. Exit Farm and get new Take up joint.
0940	Mike walkup brought a 2' Take up joint (Tip holder) re-enter Farm and push to 15 Feet. Having trouble getting Pipe to go in straight, keeps trying to kick out To the mast. There seems to be an obstruction at 4 Feet. Keep working tools to try and clear obstruction.
1130	At 15 Feet and ready to sample. Pipe is running True and is at 60.8°
1145	Lunch
1215	Waiting for Rct's to pull rods and run sampler
1230	Enter Farm, pull dummy tip, run sampler
1320	Drive Sample 15' to 17' Pull out and wait for recovery
1348	40% recovery, will pull another sample from 17' to 19' tomorrow.
1405	Exit Farm.
1430	Head to office
1530	End shift

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO: Villarreal, snook* *HPT: Templeton, Randy* *FWS: Simons* *PNG: ~~Price~~ Zo2*	**WEATHER:** 48 F, mostly cloudy with rain throughout the day. Wind gusts 20-25 mph in the afternoon. **DOWNTIME:** 1 hr. POD	**DISCARDED ITEMS:** 1 - 2 5/8 Box to Box 2' 1 - Bag Sand

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** Dave Skoglie **DATE:** 3/02/11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I002		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S **V11-001-007**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2BX89	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-008**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1M1	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M2	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M3	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

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ENERGYSOLUTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100 and possibly run gyro. (PNG)		**DATE:** 03-02-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 42

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 8 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	Interval	%
1. 020X90	17-19	100%
2. 020IM4		90%
3. 020IM5		0
4. 020IM6		Ø

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8 @ 17 to 31.1 ft bgs: S.U. 2.9

Borehole # — Tubing (— @ — to — ft bgs: S.U. —

Borehole # — Tubing (— @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY Hrs. 445.5 Rig XL
0600	Safety meeting at office. Topic: Windy Days.
0650	At C Farm, waiting for POD
0700	Glenda + Greg at C Farm, waiting for RCTs
0745	POD, discussed back to back sample from 17 to 19 Feet and running gyro
0800	Enter Farm, pull inner rod and run in sampler and drive sampler from 17 to 19 FT
0900	run dummy tip in and drive to 31.1 feet to run Gyro.
1000	Randy on site, running Gyro
1200	Lunch
1230	waiting on Gyro information
1530	End Shift
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snook, Villarreal *HPT:* Templeton, Bernard *FWS: Simons/Davis* *PNG: Price*	**WEATHER:** 52 F, mostly cloudy with light rain throughout the day. Winds from the south at 10-20 mph. **DOWNTIME:** 1 hr. POD 5.5 hr. Gyro	**DISCARDED ITEMS:** 3 liners, 4 caps

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:**
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** **DATE:**

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I003		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S V11-001-009

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2BX90	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S V11-001-010

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1M4	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M5	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M6	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

100% shoe
90% A
Ø S
Ø C

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100. **DATE:** 03-03-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford | **EXCAVATION:** DAN-11-0004287, U-DIG #10275349 | **REPORT #:** 43

START CARD NO. SE08643 | **DECOMMISSION NO.** AE11450 | **RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2

SAMPLING SUMMARY | **SITE/EQUIPMENT INSPECTION:** (Yes) No | *HHU CASE#1 HHU CAT #2* (HHUXL#3)

Sample #'s	Interval	%
1. B2BXR4	54 to 56	100%
2. B2B1M7		
3. B2B1M8		
4. B2B1M9		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 31.1 to 56 ft bgs: S.U. 2.3

Borehole # ____ Tubing ( ) @ to ft bgs: S.U.

Borehole # ____ Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: It's The Sudden Stop That Hurts.
0645	AT C Farm waiting for POD
0800	POD, Drill to depth of 54' sample and go to Cyce depth
0830	Enter Farm and drive to 54' to sample
0920	AT depth, exit Farm, waiting for operator, RCT, to pull inner rods
0940	Enter Farm, pull rods and run in sampler
1017	Drive Sample 54' to 56', pull out sample and wait for recovery percentage
1040	not enough sample to process, we will run a back to back sample from 56' to 58'
1050	Exit Farm for Lunch
1100	Lunch
1130	work is suspended due to something with decon Trailers being down
1210	Head to office
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO: Shap, Villarreal
HPT: Templeton, Bernard
FWS: Simons/Davis

WEATHER: 49 F, mostly cloudy with a chance of showers. Winds from the southwest at 5-10 mph.

DOWNTIME: 1 hr. POD
4 hr. due to decon-t.

DISCARDED ITEMS: N/A
3 SS liners
6 liner caps

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D E Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E Skoglie **DATE:** 3/3/11

10/06/09 Rev 1

54-56

FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I004		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S **V11-001-011**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2BXR4	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-012**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1M7	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M8	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1M9	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SHOE - 100%
LINER A - 80%
" B - ~~A~~
" C - ~~A~~

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-07-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 44

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes No*	*HHU CASE#1 HHU CAT #2 HHUXL#3*

SAMPLING SUMMARY

Sample #'s	Interval	%
1. B2B435	56-58'	
2. B2B1N0		100%
3. B2B1N1		70%
4. B2B1N2		0%

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 56 to 60 ft bgs: S.U. 2.3

Borehole # — Tubing (—) @ — to — ft bgs: S.U. ___

Borehole # — Tubing (—) @ — to — ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Emergency Warning Devices.
0700	on site, waiting for POD
0745	Greg on site, ness on site, waiting on RCT's
0807	RCTs on site, Hold POD. Topics: Gyro and Sample
0816	Enter form and get ready to drive Sample 56 to 58
0901	Drive 56-58' Sample
0945	Push dummy tip to 60' for Gyro run
1010	AT Gyro depth of 60', Set up Randy to begin Gyro
1030	Randy is running Gyro
1215	Gyro Complete
1230	Lunch
1300	Head to office
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snook, Rittera *HPT:* Templeton *FWS: Simons/Davis*	**WEATHER:** 50 F, mostly cloudy with a chance of showers. Winds from the southwest at 5-15 mph. **DOWNTIME:** 1 hr. POD 5.5 hrs. Gyro	**DISCARDED ITEMS:** 3 · Liners 6 · Caps

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Ames	**SIGNATURE:** David Skoglie **DATE:** 3/8/11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I005		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S V11-001-013

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B435	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S V11-001-014

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1N0	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1N1	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1N2	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SHOE - 100%
LINER "A" - 100%
" "B" - 70%
" "C" - ~~0~~

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100. PNG run gyro at next interval.		**DATE:** 03-08-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 45
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	Interval	%
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 7/8") @ 60 to 70.1 ft bgs; S.U. 4.2

Borehole # _____ Tubing ( ) @ to ft bgs; S.U. ___

Borehole # _____ Tubing ( ) @ to ft bgs; S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Law And Conditions Dictate Speed.
0649	AT C Farm, waiting for RCT's to have POD
0748	RCT's on site, Hold POD. Topic. Push to 70' and Gyro
0800	Enter Farm and drive to 70.1 Feet
0930	AT depth at 70.1. clean up up site, Go mark Holes by 101 with Harold. Randy Rice enters zone to Gyro
1000	Running Gyro NOTE: while advancing 2 7/8 rods, we let the head float in without pushing, ~~and~~ we used fast rotation and worked back and forth trying to keep pipe going straight.
1200	Lunch
1230	Waiting on Gyro
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Snook, Villarreal, Williams *HPT:* Templeton *FWS:* Simons/Davis	**WEATHER:** 52 F, mostly cloudy with 50% chance of rain. Winds from the south at 10-15 mph, gusting to 30 mph. **DOWNTIME:** 1 hr. POD 5.5 hrs. Gyro	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Ames	**REVIEWED BY:** RZ Steffler **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** R.Z. Steffler **DATE:** 3-9-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100. Run camera survey at #C8100.

DATE: 03-09-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 46

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 9 AHA-10-007, Rev. 2

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.	N/A	
3.		
4.		

SITE/EQUIPMENT INSPECTION: (Yes) No

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8") @ ~~70.1~~ 70.1 to ~~70.1~~ 76' ft bgs: S.U. ~~4.5~~ 4.5'

Borehole # N/A Tubing ( ) @ to ft bgs: S.U. 4.5'

Borehole # N/A Tubing ( ) @ to ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: PPE Protection.
0620	TRAVEL TO ACE'S STATION
0700	ARRIVE AT MO 524 STANDBY FOR PREJOB.
0715	FWS G. DAVIS ON SITE STANDby FOR RCT'S
0745	RCT'S ON SITE FOR PRE-JOB
0750	DRESS OUT & ENTER FARM
0800	ENTRY INTO FARM ON "HOLD" STANDby FOR RAIN.
0900	RAIN STOPPED DRESS & ENTER FARM. TO CAMERA C8100
0940	CAMERA NOT WORKING BAD DC POWER CORD. EXIT FARM
0945	TRAVEL TO OFFICE FOR REPAIR OF CAMERA
1020	ARRIVE AT OFFICE PICKUP NEW DC POWER ADAPTER
1115	TRAVEL BACK TO C-FARM
1200	DRESS & ENTER FARM TO CAMERA C8100
1220	SET UP & CAMERA C8100 FOUND NO DISCREPENCIES.
1300	TRIP IN DUMMY TIP, SET UP AND DRIVE 2 5/8 DW 55
—	FROM 70.1' bgs TO NEXT SAMPLE INTERVAL 76' bgs.
1350	SECURE SITE AND EXIT FARM.
1400	TRAVEL TO OFFICE. COMPLETE PAPER WORK
1530	END OF SHIFT.
	NOT USED

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley ENRGOTT, REPKO
NCO: SWOOK, VILLEAL, WILLIAMS
HPT: TEMPLETON, BARNHARD, CLOUGH
FWS: ~~Simms~~ Davis AE

WEATHER: 56 F, mostly cloudy with rain throughout the day. Winds from the south at 5-15 mph.

DOWNTIME: 1HR - RAIN
2HR - REPAIR FOR CAMERA;
45 MIN. FOR PREJOB.

DISCARDED ITEMS: NONE

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: MIKE ENRGOTT
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Mike Enrgott

REVIEWED BY: RZ Steffler
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: R.Z. Steffler
DATE: 3-10-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.

DATE: 03-10-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 47

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 9 AHA-10-007, Rev. 2

SITE/EQUIPMENT INSPECTION: (Yes) No

HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1. B2B436	76-78'	
2. B2B1N3	"	100%
3. B2B1N4	"	
4. B2B1N5	"	

BOREHOLE SUMMARY

Borehole # C8100 Tubing (7 5/8) @ 76 to 80 ft bgs: S.U. 2.3

Borehole # — Tubing (—) @ — to — ft bgs: S.U. —

Borehole # — Tubing (—) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Driver Quiz.
0700	AT C Farm, waiting for POD
0900	RCT's on site, due to high winds there will be no
	sampling at this time. waiting for wind to die down
0930	Kris Hutchins on site. Dissussed 104 and 101 Tank
	pushes at C farm.
0943	waiting for POD
1034	POD, Getting Sample at 76'-78'
1039	Enter C Farm and rip out inner rods then run
	in Sampler and drive
	~~1148 Drive Sample from 76' to 78'~~
1148	Drive Sample from 76' to 78' 100% recovery
1205	Exit zone
1215	lunch
1245	Enter C-Farm and run dummy tip in and begin
	driving to 118'
1305	Dummy tip is not going into tip holder properly.
	Contact Mike Walkup and explain that something is
	wrong. Mike has us exit zone and get camera
	ready to run. ~~Ex~~ In no more work due to wind
1330	Head to office to locate camera
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley
NCO: Snook, Williams
HPT: Templeton, Bernard
FWS: Simons/Clark

WEATHER: 55 F, mostly cloudy with rain throughout the day. Winds from the southwest at 15-25 mph.

DOWNTIME:
1 hr RCT's POD
5 hrs due to wind

DISCARDED ITEMS:
7 - lines
6 - CAPS

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: ES TECHNICAL PREPARER
SIGNATURE: Olin Amos

REVIEWED BY: RZ Steffler
TITLE: ES TECHNICAL REVIEWER
SIGNATURE: R.Z. Steffler
DATE: 3-11-11

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76' - 78'

FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I006		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S **V11-001-015**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B436	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-016**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B1N3	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1N4	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2B1N5	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-11-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 48

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2* (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8") @ 80 to 76 ft bgs; S.U. 2.3

Borehole # — Tubing (—) @ — to — ft bgs; S.U. —

Borehole # — Tubing (—) @ — to — ft bgs; S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY (hrs. 450.8)
0600	Safety meeting at office. Topic: Bench And Pedestal Grinders.
0645	on site at C-Farm, waiting for RCTs and project manager for POD
0800	RCTs on site, waiting for Greg
0819	POD. discussed activities for day, Pull two rods to check why Tips are not seating properly in tip holder. Run Camera in hole: Appears to be rolled in on the end.
0900	call Mike walkup and explain about the tip holder. He has us exit zone and go to Laydown yard and get a new tip holder
1100	Back at C-Farm with new tip holder. we will not pull 2 5/8" until Monday due to limited time available to get the rods back to depth today and not wanting to leave hole open through the weekend. Lunch
1130	Enter Farm to set up gear for monday
1230	Out of Farm, Head to office
1430	End shift
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Williams, Willwood *HPT:* Templeton, Bernard *FWS:* Simons/Clark	**WEATHER:** 59 F, mostly cloudy with a slight chance of rain. Winds from the south at 5-10 mph. **DOWNTIME:** 1.5 hrs. POD	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** RZ Stoffler
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Ames	**SIGNATURE:** R.Z. Stoffler **DATE:** 3-14-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Back-pull and re-drive #C8100. PNG run gyro at 60.0' bgs.		**DATE:** 03-14-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 49
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes* (No)	*HHU CASE#1* *HHU CAT #2* (*HHUXL#3*)

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8100 *Tubing (* 2 5/8 *)* @ 76 *to* – *ft bgs. S.U* 2.3

Borehole # — *Tubing (* *)* @ – *to* – *ft bgs: S.U.* –

Borehole # — *Tubing (* *)* @ – *to* – *ft bgs: S.U.* –

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: What Is Your Back IQ?
0700	on site at C-Farm, waiting for POD, rad's on site
0755	Glenda on site, waiting on RCT's
0800	Just got notification that its (AOPS) Too windy to pull pipe back
0930	Randy Price on site to go and calibrate instrumentation.
1000	No work due to wind, head into office
1100	Lunch
1130	Down due to wind
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Ehrgott *NCO:* Snook, Villarreal, Williams *HPT:* Templeton, Clough *FWS.* Davis *PNG:* Price	**WEATHER:** 55 F, partly cloudy with a chance of showers. Winds from the southwest at 5-15 mph. **DOWNTIME:** 8 hrs. wind	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Ames	**SIGNATURE:** David E. Skoglie **DATE:** 3/15/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Back-pull and re-drive #C8100. PNG run gyro at 60.0' bgs.		**DATE:** 03-15-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 50

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1* *HHU CAT #2* (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8) @ 76 to 0 ft bgs: S.U. 2.3 Pulled out

Borehole # C8100 Tubing (2 5/8) @ 0 to 60 ft bgs: S.U. 2.3 reinstalled

Borehole # — Tubing (—) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Off-The-Job Safety.
0700	AT C-Farm, waiting for POD. Personnel ACE.
0750	POD, Pull rods, repush to 60 feet, and Gyro.
0810	Enter Farm to pull 2 5/8 inch out of hole to check tip holder.
1015	Tip holder looks good, put new tip holder & tip on string and run to 60 feet.
1100	Randy is in C-Farm running Gyro. NOTE: Tip and tip holder was seating fine, measured a few of the 2 5/8" casing and found tip to be 1/8 inch short of 4 foot. This is probaley the reason for the inner rod sticking up higher then normal. The tip holder however was worn down enough that the sampling tip would be out passed the end enough that if it got bent, it would possibly not be able to be extracted out of the tip holder.
1245	Randy is out of C-Farm. Gyro complete, waiting on results
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Snook, Williams, Villarreal *HPT:* Templeton *FWS:* Davis *PNG:* Price	**WEATHER:** 56 F, mostly cloudy with rain showers likely. Winds from the southwest at 10-20 mph. **DOWNTIME:** 1 hr. POD 4.5 hr. Gyro	**DISCARDED ITEMS:** 1- Tip holder 1- Tip

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Ames **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Ames	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 3/16/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-16-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 51
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2* (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 7/8") @ 60 to 118 ft bgs: S.U. 2-3-4-3

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # _____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Accidents Before And After.
0700	AT C-Farm, waiting for POD
0745	POD. Items discussed (push to 118' for next sample
0800	Enter Farm and begin pushing
1045	Shut down due to crew below us pulling blocks out of C-104 Pit. They cannot communicate with our equipment running. Exit farm. Down 23 rods.
1100	Lunch
1130	Still waiting on crew inside dealing with C-104 Blocks
1237	Got OK to go back to driving pipe
1245	Enter C-Farm and push pipe
1430	Exit Farm, at sample point at 118 feet
1445	Head to office
1530	End Shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snook, Willoughell *HPT:* Templeton, Joe *FWS: Davis*	**WEATHER:** 58 F, mostly cloudy with rain showers likely. Winds from the southwest at 5-15 mph. **DOWNTIME:** 1 hr. POD 2 hrs. due to crews at C-104	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** RZ Steffler
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** R.Z. Steffler **DATE:** 3-17-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Check Alignment and set offsets for C8100 Sample Hole.	DATE: 3/17/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	EXCAVATION: DAN-11-0004287 U-DIG #:10275349
REPORT #: ~~51~~ 52	

START CARD NO.SE08643	DECOMMISSION NO. AE11450	RWP: CO-601.Rev. 9 AHA-10-007 Rev 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: Yes (No)	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 7/8) @ 118 to ft bgs: S.U. 2.3

Borehole # — Tubing (—) @ — to — ft bgs: S.U. —

Borehole # — Tubing (—) @ — to — ft bgs: S.U. —

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: "Near Miss"
0700	AT C Farm, waiting for POD
0800	Call Bill to see if anything is going to happen today. Due to priority work in C Farm on the C104 pump, we will not be able to perform any work today.
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 ES SUPPORT: Weakley NCO: — HPT: — FWS. Simons	WEATHER: 50 F, Partly Sunny DOWNTIME: 8hrs. Due to other work in the Farm	DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Olin Ames TITLE : ES TECHNICAL PREPARER SIGNATURE: Olin Ames	REVIEWED BY: RZ Steffler TITLE: ES TECHNICAL REVIEWER SIGNATURE: R.Z. Steffler DATE: 3-21-11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.

DATE: 03-21-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: ~~52~~ 53

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 9 **AHA**-10-007, Rev. 2

SAMPLING SUMMARY

SITE/EQUIPMENT INSPECTION: (Yes) No

HHU CASE#1 *HHU CAT #2* (*HHUXL#3*)

Sample #'s	Interval	%
1. A2B437	100% 118'-120'	
2. B2C1K8		
3. B2C1K9		
4. B2C1L0		

BOREHOLE SUMMARY Rod #39

Borehole # C8100 Tubing (2 3/8) @ 118' to 152 ft bgs: S.U. 63

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

Borehole # ___ Tubing ( ) @ ___ to ___ ft bgs: S.U. ___

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Minor Injuries.
0700	AT C Farm, waiting for POD
0750	POD, discussed pulling inner rod and run sampler to 118' to 120'.
0800	Enter Farm and trip inner rods out and drive sample
0915	Drive Sample (100% recovery) 118'-120'
	Trip out sampler and trip in dummy tip and
	drive to 165 Feet for a Gyro run.
1139	lunch at ~~138~~ 138'
1220	Enter Farm and continue pushing rods.
1335	Rods are getting tight, we will keep working rods to
	try and loosen them up.
1400	About 149 rods seem to be trying to go off, pull
	back 2 rods and repush
1415	Broke Drive head, remove and exit Farm.
1430	roundup a new Drive head
1530	End SHIFT
	N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Weakley, Walkup
NCO: Smoak, William
HPT: Tampleton, Bernard
FWS: Davis/Simons

WEATHER: 53 F, mostly cloudy with rain showers likely. Winds from the southwest at 10-15 mph.

DOWNTIME: 1 hr. POD

DISCARDED ITEMS:
3 - Lynch pins
1 - Drive head

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: RZ Steffler
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: R.Z. Steffler
DATE: 3-22-11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		**PAGE** 1 **OF** 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I007		**LOGBOOK NO./PAGE**	
WELL NAME ORIGINAL		**WELL ID**	**ACTUAL DEPTH** ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		**BOTTOM OF BOREHOLE (bgs)**	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	**TOTAL NUMBER OF CHAINS** 2	**COLLECTOR**	

222-S **V11-001-017**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B437	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-018**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1K8	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1K9	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1L0	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Drive to gyro interval at #C8100. PNG run gyro.	**DATE:** 03-22-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349
	REPORT #: 54

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes No*	*HHU CASE#1 HHU CAT #2 HHUXL#3*

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8100 *Tubing (* 2 5/8 *) @* 152 *to* 165 *ft bgs: S.U.* 3.3

Borehole # — *Tubing (* — *) @* — *to* — *ft bgs: S.U.* ___

Borehole # — *Tubing (* — *) @* — *to* — *ft bgs: S.U.* ___

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1. C8100	65-165	moist.
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Save Your Hands.
0645	AT C Farm, waiting for POD
0745	Held POD
0800	Enter C-Farm
0930	AT depth for Gyro at 165', waiting for Randy, Exit Farm
1010	Randy and Rory are on site. They will enter C Farm and run the Gyro and moisture log C8100.
1100	Lunch
1130	Doing Gyro and moisture
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Walkup *NCO:* Snook, Williams *HPT:* Templeman; Bernard *FWS:* Davis *PNG:* Price	**WEATHER:** 54 F, mostly cloudy with isolated showers. Winds from the southwest at 5-15 mph. **DOWNTIME:** 1 hr. POD 6 hr. Gyro & moisture log	**DISCARDED ITEMS:** 3-Lynch Pin

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos **TITLE:** *ES TECHNICAL PREPARER* **SIGNATURE:** Olin Amos	**REVIEWED BY:** D.E. Skoglie **TITLE:** *ES TECHNICAL REVIEWER* **SIGNATURE:** David E. Skoglie **DATE:** 3/23/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-23-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 55
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes No*	*HHU CASE#1 HHU CAT #2 HHUXL#3*

SAMPLING SUMMARY

Sample #'s	Interval	%
1. B20438 2. B2C1L1 3. B2C1L2 4. B2C1L3	168.6 - 170.6	100% recovery

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8") @ 165 to 170.6 ft bgs: S.U. 4.6

Borehole # — Tubing ( ) @ to ft bgs: S.U.

Borehole # — Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Foresight Preserves Eyesight.
0645	AT C Farm, waiting for POD
0750	Everyone is onsite, waiting for sample depth information.
0830	Enter Farm, got info from Harold on sample depth 168.6. Run dummy tip in and push to 168.6. Pull inner rod and run in Sampler
1030	Drive Sample from 168.6 to 170.6. Pull out Sampler and run in dummy tip.
1200	Exit Farm, no further work today due to All hands meeting for RCTs & operators, Take Lunch
1230	Down due to all hands meeting note: Rod #43 in on the Rig
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT: Weakley, Walkup* *NCO:* Snook, Williams *HPT:* Clough, Bernard, Templeton *FWS: Davis/Simons*	**WEATHER:** 55 F, mostly sunny with winds from the southwest at 5-10 mph. **DOWNTIME:** 1.5 hrs. waiting on sample depth 3.0 hrs. All Hands Mtg.	**DISCARDED ITEMS:** 3 - Lynch Pins

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 3/24/11

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168.6- 170.6 100%

FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I008		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S **V11-001-019**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2B438	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-020**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1L1	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1L2	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1L3	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-24-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 56

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1* *HHU CAT #2* (HHUXL#3)

Sample #'s	Interval	%
1. B2C1L4	~~204-~~	100%
2. B2C1L6	202-204	100%
3. B2C1L7		75%
4. B2C1L8		90%

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 7/8) @ 170.6 to 204 ft bgs: S.U. 2.3

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: The Term Ergonomics.
0645	AT C-Farm, marking for POD
0745	Hold POD. Pushing to 202', for sample
0800	Enter C Farm and begin pushing to 202 Feet.
1009	Pull inner rods (at sample depth at 202 Feet.)
1111	inner rods out, Exit Farm for Lunch.
1135	Lunch
1205	Enter C Farm, run sampler in hole and take sample
1314	Drive Sampler from 202 to 204', pull out and run dummy tip in hole
1420	Exit Farm
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley, Walkup *NCO:* Williams, Cambell *HPT:* Templeton, Bernard *FWS:* Davis/Simons	**WEATHER:** 59 F, partly cloudy with isolated showers. Winds from the north at 5-10 mph. **DOWNTIME:** 1 hr. POD	**DISCARDED ITEMS:** 6 - Lynch Pins 3 - Liners 6 - Caps

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 3/25/11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		**PAGE** 1 **OF** 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I009		**LOGBOOK NO./PAGE**	
WELL NAME ORIGINAL		**WELL ID**	**ACTUAL DEPTH** ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		**BOTTOM OF BOREHOLE (bgs)**	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	**TOTAL NUMBER OF CHAINS** 2	**COLLECTOR**	

222-S **V11-001-021**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1L4	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-022**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1L6	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1L7	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1L8	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SHOE - 100%
A - 100%
B - 75%
C - 80%

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Continue sampling activities at #C8100.		**DATE:** 03-25-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 57

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2 (HHUXL#3)*

SAMPLING SUMMARY

Sample #'s	*Interval*	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8100 *Tubing (* 2 7/8 *) @* 204 *to* 220.5 *ft bgs: S.U.* 4

Borehole # _____ *Tubing (* *) @* *to* *ft bgs: S.U.*

Borehole # _____ *Tubing (* *) @* *to* *ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Borung #	*Interval*	*Type*
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Mistaken Signals, Signals Crossed---A Life Lost.
0700	on site, waiting for POD
0807	POD C-run to 252'
0815	Enter Farm, begin pushing
1010	out of Farm. Get ahold of walkup and tell him that the new rods with plugs will not work (inner rods). The cap will not seat due to the plug inside being to higher the cap to seat in all the way. Pull some inner rods out of the RMA at Lower-C To complete hole
1030	Enter Farm and continue to drive pipe
1130	Exit Farm, rods are not advancing and getting very tight. Take Lunch and let head cool. Rod #56 is on.
1200	waiting for NCO's to come back with a key for C Farm.
1300	Enter Farm and try pushing rods. Rods will not advance and the torque stalled out the head. Pulled rods back 6 inches to free up. (re fusal) at 220'
1318	Exit Farm
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Lucas, williams *HPT:* Templeton *FWS:* Simons	**WEATHER:** 62 F, mostly cloudy with rain showers. Winds from the southwest at 5-15 mph. **DOWNTIME:** 1hr. POD	**DISCARDED ITEMS:** 8 Lynch Pins

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 3/28/11

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Run gyro at #C8100 and begin decommissioning.		**DATE:** 03-28-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #**10275349	**REPORT #:** 58

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1* *HHU CAT #2* (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	*Interval*	%
1.		
2.		
3.	N/A	
4.		

BOREHOLE SUMMARY

Borehole # C8/14 *Tubing (* 2 7/8 *)@* 220.8 *to* 222.8 *ft bgs: S.U.* 3.5 (3 DEA)

Borehole # ___ *Tubing (* ___ *)@* ___ *to* ___ *ft bgs: S.U.* ___

Borehole # ___ *Tubing (* ___ *)@* ___ *to* ___ *ft bgs: S.U.* ___

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Use Of Hand Signals...Everybody On The Same Page. ESFS Safety Staff Presentation.
0700	AT C-Farm, waiting for POD
0820	POD, all the players are present, Hold POD. discussed Putting rods back to 222.8 and pull a sample.
0930	Enter farm and push rods from 220 to 222.8' Pull inner rods to take a sample from 222.8 to 224.8.
0900	having trouble pulling out inner rods. we can't get it loose from the tip holder.
0912	Tip is coming out, pull inner rods
1000	Called mike and told him about the tip. A disicion was made to Gyro and moisture log the hole before trying to sample just incase the sample becomes stuck in the tip holder. (Per Mike walkup)
1015	Rory enters farm to run Gyro. Scope
1050	Rory has to run to town to get more instrumentation from Randy. He is having trouble with the winch.
1100	Lunch
1130	waiting for ~~Randy~~ Rory to return to continue running the Gyro
1200	Rory is running Gyro
1530	End shift, Gyro complete to 222.8
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* Snook, Williams, Sharp *HPT:* Bernard, *FWS:* Simons	**WEATHER:** 57 F, mostly cloudy with rain showers. Winds from the northwest at 5-15 mph. **DOWNTIME:** 1.5 hrs. POD	**DISCARDED ITEMS:** 1 - Tip

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE : *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** Daniel E Skoglie **DATE:** 5/29/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Run moisture log at #C8100.		**DATE:** 03-29-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 59
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** Yes (No)	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

BOREHOLE SUMMARY

Borehole # C8100 Tubing (25/8) @ 222.8 to 222.8 ft bgs: S.U. 3.5

~~Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____~~

~~Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____~~

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1. C8100	020-120	m
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Backhoe Safety.
0645	AT C Farm, waiting for POD
0745	POD (discussed moisture logging today)
0800	Enter Farm with Rory, Fuel Generators. Help set up to Moisture log. Having trouble with the depth meter.
0900	Logging hole
1200	Kicked out of the farm due to all hands meeting down town. Rory Logged from 220' to 120'. Down for the rest of the day.
1530	down for all hands meeting.

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Steffler
NCO: Snook
HPT: Bernard
FWS: Simons

WEATHER: 58 F, mostly cloudy with light rain. Winds from the southwest at 5-15 mph.

DOWNTIME:
1. POD
3. All hands mtg

DISCARDED ITEMS:

N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 3/30/11

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ENERGYSOLUTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete moisture logging at #C8100.		**DATE: 03-30-11**
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 **U-DIG #10275349**	**REPORT #: 60**
START CARD NO. SE08643	**DECOMMISSION NO. AE11450**	**RWP: CO-601, Rev. 9 AHA-10-007, Rev. 2**
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** *Yes* (No)	***HHU CASE#1 HHU CAT #2 HHUXL#3***

SAMPLING SUMMARY

Sample #'s	*Interval*	*%*
1.		
2.		
3.		
4.		

NA

BOREHOLE SUMMARY

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.* ____

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.* ____

Borehole # _____ *Tubing (* *)@* *to* *ft bgs: S.U.* ____

GEOPHYSICAL LOGGING

Boring #	*Interval*	*Type*
1. C8100	125-0	Moisture
2.		
3.		

TIME	WORK SUMMARY
0600	**Safety meeting at office. Topic: Nitrogen Safety.**
0700	Arrived at C Farm. Set up computers. ACE in.
0750	Pre job.
0805	Receive source + enter farm to begin moisture logging from 125' bgs.
1153	Moisture logging complete. Site + equipment secured.
1230	Travel back to office. Final sample attempt to be tried on 3-31-11
	No available personel, ES or Sampling operators to attempt today.

NA

OPERATOR/LICENSE: Steffler
ES SUPPORT: Steffler
NCO: Snook / Izzy
HPT: Templeton, Bernard, Clough
FWS: Simons + Davis

WEATHER: 67 F, mostly cloudy with some showers. Winds from the southwest at 10-15 mph. Gusting 25-40 mph in the afternoon.

DOWNTIME: .75 hr. for pre job, 3 hrs - No support.

DISCARDED ITEMS: None

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: RZ Steffler
TITLE : *ES TECHNICAL PREPARER*
SIGNATURE: R.Z. Steffler

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: David E. Skoglie **DATE:** 3/30/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete sampling and begin decommissioning #C8100.		**DATE:** 03-31-11
LOCATION: "C" Tank Farm, 200 East Area, Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 61
START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2

SAMPLING SUMMARY

Sample #'s	Interval	%
1.		
2.		
3.		
4.		

N/A

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8") @ 2228 to — ft bgs; S.U. 3.5

Borehole # ____ Tubing ( ) @ to ft bgs; S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs; S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.		
3.		

N/A

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Windy Days.
0615	Down due to High wind (AOP-008)
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Weakley *NCO:* — *HPT:* — *FWS:* Simons —	**WEATHER:** 73 F. partly cloudy and warm. Winds from the southwest at 20-30 mph with higher gusts. **DOWNTIME:** 9 hrs. due to wind	**DISCARDED ITEMS:** N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 3/31/11

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: C8100 Sample 222.8'bgs then Decommission		DATE: 4/04/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	EXCAVATION: DAN-11-0004287 U-DIG #:10275349	REPORT #: 62

START CARD NO.SE08643	DECOMMISSION NO. AE11450	RWP: CO-601.Rev. 9 AHA-10-007 Rev 2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: (Yes) No	HHU CASE#1 HHU CAT #2 (HHUXL#3)

Sample #'s	Interval	%
1. B2C1L5	222.8-224.8	100%
2. B2C1L9		
3. B2C1M0		
4. B2C1M1		

BOREHOLE SUMMARY

Borehole # C8106 Tubing (2 5/8) @ 222.8 to 224.8 ft bgs: S.U. —

Borehole # C8100 Tubing (2 5/8) @ 224.8 to 217.8 ft bgs. S.U. 6.5

Borehole # - _____ Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

XL hrs. 468.2 #3

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Working Together.
0645	AT Trailer at C-Farm, waiting for POD
0805	POD, Pull Sample at 222.8-224.8
0820	Enter Farm run in sampler.
0930	Drive Sampler from 222.8 to 224.8, Pull out Sampler
1025	Sampler out pull 2 5/8" back 4 Feet, Rod #56 is still on, broke Lower Head jam on breakout wrench. 100% on Sample. Clean up inner rods and exit Farm. Head to office to work on paper stuff. Down for the rest of the day. Meet down
1100	Leave Laydown yard and head to office.
1130	Lunch
1200	Down for the ~~day~~ rest of the day.
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224 ES SUPPORT: Weakley NCO: Snook, Willoughall HPT: Barnard FWS: Simons	WEATHER: 50 F, Partly Sunny DOWNTIME: 1.25 hrs. POD 4.5 hrs. no crew ES	DISCARDED ITEMS: 1 - Lynch pin 1 - heel jam 36" 3 - liners 6 - Caps

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Olin Amos	REVIEWED BY: D.E. Skoglie
TITLE : ES TECHNICAL PREPARER	TITLE: ES TECHNICAL REVIEWER
SIGNATURE: Olin Amos	SIGNATURE: David E. Skoglie DATE: 4/05/11

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FIELD CHARACTERIZATION SOIL/OTHER SOLIDS SAMPLING REPORT

PROJECT(S) WMA C Sampling for CMS		PAGE 1 OF 2	
		DATE/TIME	
SAF NO.(S) V11-001			
LOCATION C8100 I010		LOGBOOK NO./PAGE	
WELL NAME ORIGINAL		WELL ID	ACTUAL DEPTH ☐ft ☐m
BOTTOM OF CASING (bgs) ☐ft ☐m		BOTTOM OF BOREHOLE (bgs)	☐ft ☐m
SAMPLES COLLECTED			
TOTAL NUMBER OF BOTTLES 4	TOTAL NUMBER OF CHAINS 2	COLLECTOR	

222-S **V11-001-023**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1L5	1 / 500mL / Gs		Cool~6C	Generic Testing;

222-S **V11-001-024**

SAMPLE NO.	BOTTLE QTY/SIZE/TYPE	LOT NO.	PRESERVATION	ANALYSIS
B2C1L9	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1M0	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
B2C1M1	1 / 160g / Liner		Cool~6C	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Decommission C8100		DATE: 4/05/11
LOCATION: "C" – Tank Farm 200 West Area Hanford	EXCAVATION: DAN-11-0004287 U-DIG #:10275349	REPORT #: 63

START CARD NO.SE08643	DECOMMISSION NO. AE11450	RWP: CO-601.Rev. 9 AHA-10-007 Rev.2
SAMPLING SUMMARY	SITE/EQUIPMENT INSPECTION: (Yes) No	HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C-8100 Tubing (2 5/8) @ 219.8 to 143.3 ft bgs: S.U. 3'

Borehole # N/A Tubing ( ) @ to ft bgs: S.U.

Borehole # - N/A Tubing ( ) @ to ft bgs: S.U.

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Understanding Safety Signs.
0624	Drive to ACES
0700	Arrive at ACES ACE in, Drive to Chem. Storage pickup 14 bags bent
0730	Arrive back at C-Farm, Standby for pre-job.
0745	Pre-job with crew, discussed decommissioning. Dress in whites
0833	Rig inspection, fuel rig with diesel. setup zones.
0845	Start back pulling from 219.8' bgs.
0908	Backpulled casing to 203.3' bgs with 3' stickup, add bentonite
—	18' of bentonite, (1 gal = 3' bentonite) 5.5 1 gal cups.
0916	Start backpulling at 203.3' bgs
0936	Back pulled to 46 joints = 183.3' bgs with 3' stickup. Ran Tagger to 186.3
—	start pouring bentonite, added 18' bentonite, 5.5 cups.
0943	Start backpulling from 183.3' bgs
0953	Backpulled casing to 44 joints to 175.3' bgs with 7' of stickup. Hose was
—	leaking from breakout wrench, Mr Weakley knows about it from
—	previous. He Tightened, it looks ok for now, but needs replaced
—	Exit zone out of whites, Take break.
1000	Break lunch
1041	Dress in whites start backpulling from 175.3' bgs
1100	Backpulled to 163.3' bgs with 3' stickup, add 5.5 1 gal cups of bentonite
—	Ran tagger to 166.3 while dumping bentonite.
1105	Start backpulling from 163.3' bgs.
1118	Backpulled casing to 143.3' bgs with 3' stickup. Ran tagger to 146.3' bgs
—	bottom of casing added 5.5 - 1 gal cups of bentonite = 18' of bentonite in hole.

OPERATOR/LICENSE: Repko/3012 ES SUPPORT: Weakley NCO: Snook, Willneal HPT: Templeton, Bill FWS: Simons	WEATHER: 50 F. Partly Sunny DOWNTIME: 4 hr. Wind	DISCARDED ITEMS: ~~1 36" head~~ M.R. 4 bags bentonite

REFERENCE/CONTRACT INFORMATION: FSWO-DOW—035; TFC-WO-10-1281; ECN-10-001557

REPORT BY: Mark A. Repko TITLE: ES TECHNICAL PREPARER SIGNATURE: Mark A. Repko	REVIEWED BY: D.E. Skoglie TITLE: ES TECHNICAL REVIEWER SIGNATURE: David E. Skoglie DATE: 4/6/11

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DAILY WORK RECORD – CONTINUATION PAGE

Date	Boring #	Continuation of Report No.
~~08 to 10~~ 4/5/11	~~C-8020~~ C-8100	#63

TIME	WORK SUMMARY
1125	Wind picked up Hpt's called no more back pulling
—	due to wind over 20mph. Put Rig in safe configuration
—	secure site, exit zone. Standby for wind.
1130	Dress out of whites, exit farm.
1145	Drive to ESFS.
1217	Arrive at ESFS. Standby for wind. Paperwork, Timecard
1530	End of shift.

Notes: I talked to Olin this morning and we concluded it would not be good to drop the tagger out of bottom of casing, in case of tagger not making it back in the casing. So we used a measure method. 3' bentonite = 1gal. Added 5.5 1-gal ~~[illegible]~~ that measured 1gal = 18' bentonite. We backpulled 20' casing at a time. We did 4 intervals today, it is assumed the bentonite is at 151' bgs (approx) = 8ft below the casing. The total fill calculation is approximately 72' of bentonite total in the hole. 4 bags bentonite.

Report By	Mark A. Repko	Reviewed By	D.E. Skoglie		
Title	ES Technical Preparer	Title	ES Technical Reviewer	Date	4/6/11
Signature	Mark A. Repko	Signature	David E. Skoglie		100609 Rev 1

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete decommissioning activities at #C8100.

DATE: 04-06-11

LOCATION: "C" Tank Farm, 200 East Area, Hanford

EXCAVATION: DAN-11-0004287
U-DIG #10275349

REPORT #: 64

START CARD NO. SE08643

DECOMMISSION NO. AE11450

RWP: CO-601, Rev. 9 AHA-10-007, Rev. 2

SITE/EQUIPMENT INSPECTION: Yes (No)

HHU CASE#1 HHU CAT #2 (HHUXL#3)

SAMPLING SUMMARY

Sample #'s	Interval	%
1.	N/A	
2.		
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 5/8") @ 143.3 to 143.3 ft bgs: S.U. 3

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

Borehole # ____ Tubing ( ) @ to ft bgs: S.U. ____

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.	N/A	
2.		
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Flashing Yellow.
0645	At C Farm, waiting for POD
0824	Holding POD, discussed High winds, looks like no back pulling until the wind dies down. We will go in and inspect hoses.
0840	Change of plan hose is not Leaking. ~~So we will finish the hole and check the hose out later.~~ DW
0930	Head to Laydown yard at Energy Northwest
1200	lunch
1230	Down due to wind
1530	End shift

N/A

OPERATOR/LICENSE: Amos/1224
ES SUPPORT: Repko
NCO: Snook Villarreal
HPT: Pompdetop, Bernard
FWS: Simons

WEATHER: 54 F, mostly cloudy with a chance of showers. Winds from the west at 10-20 mph.

DOWNTIME:
1.5 - POD (waiting for)
6.5 - wind

DISCARDED ITEMS: N/A

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos
TITLE: *ES TECHNICAL PREPARER*
SIGNATURE: Olin Amos

REVIEWED BY: D.E. Skoglie
TITLE: *ES TECHNICAL REVIEWER*
SIGNATURE: Daniel Skoglie **DATE:** 4/7/11

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ENERGY SOLUTIONS, WESTERN OPERATIONS

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DRILLING AND SAMPLING (PERCUSSION) DAILY WORK RECORD

PURPOSE: Complete decommissioning activities at #C8100.		**DATE:** 04-07-11
LOCATION: "C" Tank Farm. 200 East Area. Hanford	**EXCAVATION:** DAN-11-0004287 U-DIG #10275349	**REPORT #:** 65

START CARD NO. SE08643	**DECOMMISSION NO.** AE11450	**RWP:** CO-601, Rev. 9 AHA-10-007, Rev. 2
SAMPLING SUMMARY	**SITE/EQUIPMENT INSPECTION:** (Yes) No	*HHU CASE#1 HHU CAT #2* (HHUXL#3)

Sample #'s	Interval	%
1.		
2.	N/A	
3.		
4.		

BOREHOLE SUMMARY

Borehole # C8100 Tubing (2 3/8) @ 143.3 to 0 ft bgs: S.U. 0

Borehole # ~~Tubing ( ) @ to ft bgs: S.U.~~

Borehole # ~~Tubing ( ) @ to ft bgs: S.U.~~

GEOPHYSICAL LOGGING

Boring #	Interval	Type
1.		
2.	N/A	
3.		

TIME	WORK SUMMARY
0600	Safety meeting at office. Topic: Snake Bite.
0645	AT C-Farm, waiting for POD
0740	POD - Pull pipe and be (safe).
0800	Enter Farm and pull 2 3/8" pipe while adding bentonite.
1030	Exit Farm. All rods are out of C8100 and decommissioned
1100	Lunch
1130	Enter Farm to pull nails out of plate. and clean up site
1245	Exit Farm.
1315	Go to by Farm and Locate tooling needed to do monuments. Put Tooling away That by operators and RCT's get out of by Farm
1430	head to office
1530	End shift
	N/A

OPERATOR/LICENSE: Amos/1224 *ES SUPPORT:* Olson *NCO:* Snook, Villareal *HPT:* Templeton, Bernard *FWS:* Simons	**WEATHER:** 55 F, partly cloudy with a chance of showers. Winds from the west at 8-10 mph with higher gusts. **DOWNTIME:** 1 hr. POD	**DISCARDED ITEMS:** 12 - bags bentonite 1 - Tip holder

REFERENCE/CONTRACT INFORMATION: TFC-WO-10-1281; FSWO-DOW-035; ECN-10-001557

REPORT BY: Olin Amos	**REVIEWED BY:** D.E. Skoglie
TITLE: *ES TECHNICAL PREPARER*	**TITLE:** *ES TECHNICAL REVIEWER*
SIGNATURE: Olin Amos	**SIGNATURE:** David E. Skoglie **DATE:** 4/8/11

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APPENDIX D

SMALL DIAMETER GEOPHYSICAL LOGGING FOR FY 2011, C-104 ANGLE DIRECT PUSH, 241 C FARM CHARACTERIZATION

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SMALL DIAMETER GEOPHYSICAL LOGGING FOR FY 2011, C-104 ANGLE DIRECT PUSH, 241 C FARM CHARACTERIZATION

by

Russel Randall, PhD and Randall Price

to

Energy*Solutions* Federal Services, Inc.
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June 2011

Pacific Northwest Geophysics
4200 West 19th Avenue
Kennewick, Washington 99338

Three Rivers Scientific
3740 Grant Court
West Richland, Washington 99353

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2 GYROSCOPE PROBEHOLE PATH SURVEYS 1
3 GAMMA AND MOISTURE SURVEYS 3
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Figure 4. Moisture Calibration Certificate, 6.35 cm (2.5-in.) Hole. 8

TERMS

BGO	Bismuth Germinate
KUT	potassium, uranium and thorium
PNG	Pacific Northwest Geophysics

SMALL DIAMETER GEOPHYSICAL LOGGING FOR FY 2011, C-104 ANGLE DIRECT PUSH, 241 C FARM CHARACTERIZATION

1.0 PROBEHOLE SURVEYS

Pacific Northwest Geophysics (PNG) and Three Rivers Scientific provided small diameter logging in two direct-push angle probeholes installed for characterization of the vadose zone near Tank C-104 at the 241-C Tank Farm.

The logging surveys conducted in the first probehole (C8099) were more extensive than the surveys conducted in the second probehole (C8100) which was installed for sample retrieval. The small diameter probehole log surveys described in this report include:

(1) Gyroscope survey of the probehole path,
(2) Bismuth Germinate (BGO) spectral gamma scintillation detector survey, and
(3) Neutron-neutron moisture probe survey.

A summary of the gyroscope results is discussed in Section 2.0, "Gyroscope Probehole Path Surveys". The gyroscope reports for each probehole are presented in Appendix A .

Detector calibration certificates for the BGO and neutron-moisture detectors are presented in Section 3.0, "Gamma and Moisture Surveys." The survey results are presented in Appendix B for each probehole.

Figure 1 shows a map plan-view of the probehole starting locations, gyro survey depths (black dots) and probehole angle path direction (red lines) relative to the underground storage tanks within the investigation site.

2.0 GYROSCOPE PROBEHOLE PATH SURVEYS

Gyroscope surveys were collected according to approved procedures (PNG 2010). Gyroscope surveys were acquired at periodic times during probehole installation to track its path and compute the distance (deviation) between the target path and actual probehole path. Zero depth reference is at ground surface. Multiple gyroscope log runs (usually four) were recorded during each survey event (set of surveys) to show system repeatability.

The slim-hole gyroscope logging sonde is a high precision instrument, manufactured by IFG Corporation of Toronto, Ontario, Canada. The dimensions of the sonde are: (1) diameter 44mm (1.57in), (2) length 1.83m (6ft). The measure point is midway along its length. Three sensor components are recorded continuously during a gyroscope log survey at 2 samples per second: (1) Depth (distance in feet from the sonde measure point to ground surface, i.e. pipe-run length), (2) Inclinometer (2-axis tilt meter), and (3) differential change between the gyroscope axis system and the logging sonde axis system (2-axis, precision = 0.0001 degrees).

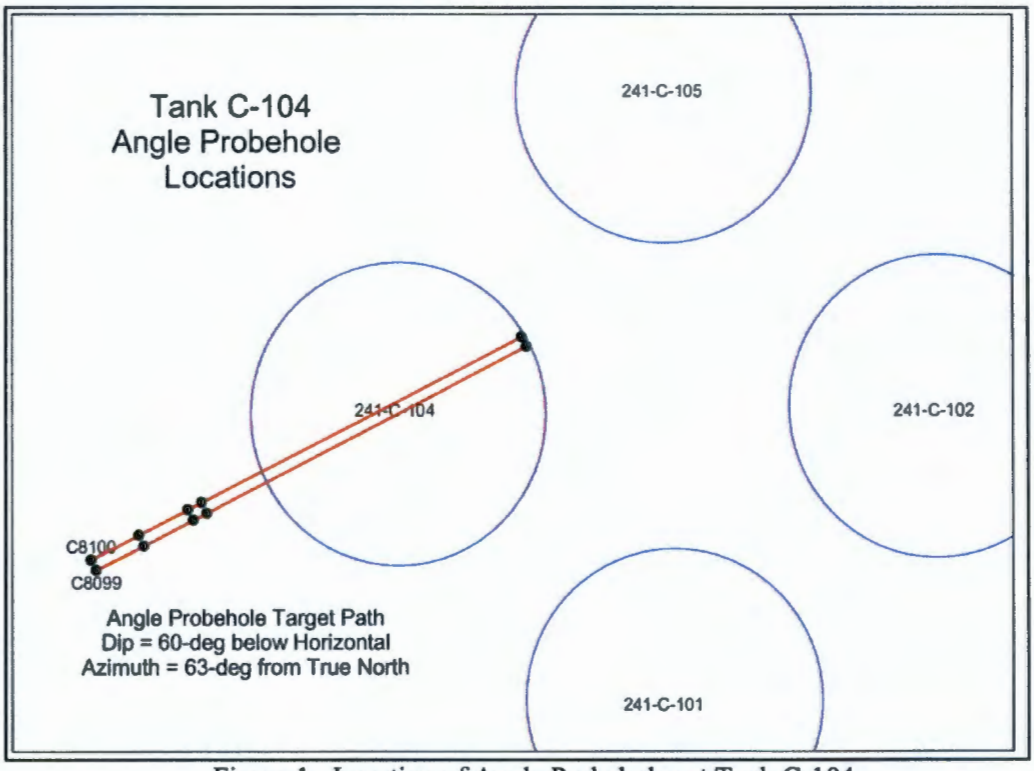


Figure 1. Location of Angle Probeholes at Tank C-104

The path of the probehole is reconstructed from the sonde movements as it is lowered to the bottom of the probehole (In-Run) and as it is withdrawn back to the ground surface (Out-Run). The cable speed is 20 feet/minute (maximum) during sonde movement. Additionally, the winch is halted after 5 minutes or less of cable movement for stationary recording of the sonde sensor outputs. The stationary measurements are a minimum of 20 seconds. Thus, a gyroscope survey contains sensor readings with the sonde both moving and stationary. The gyroscope survey processing program separates the stationary readings from the moving sonde data. The stationary readings are used to remove the minor amount of gyroscope precession (wobble) from the moving sonde data. The gyroscope wobble, which is inherent to all gyroscope systems, is less than $1/30^{th}$ of a degree per second.

The gyroscope survey processing program uses the raw survey data and two input parameters to construct the probehole path. The input parameters, which define the starting probehole location, are: (1) Dip (inclination below horizontal in degrees), and (2) Azimuth (compass bearing from true north in degrees). The processing program reports the path of the probehole in two forms: (1) X,Y,Z coordinates (Northing, Easting, Elevation) relative to (normalized to) the beginning entry location, and (2) probehole dip (degrees below horizontal) and azimuth (degrees from true north) at each survey depth reading (feet of pipe-run length).

The initial probehole starting location (program input parameter) is determined as follows:

- Dip (inclination below horizontal) of probe tubing is measured with a digital angle gauge whose accuracy was confirmed with a bubble level before each set of gyroscope surveys. The precision of the dip measurement is 0.1 degrees. The angle gauge measurement was verified by flipping the device 180 degrees. The two readings may differ by up to 0.2 degrees. The average of the two readings was input as the dip angle.
- Azimuth (true north compass bearing) of the probe tubing is maintained by the guide tube in the foot plate for the drill-rig. The orientation of the foot plate is established by two predetermined Global Positioning System (GPS) survey points, one at six meters behind and the other at one meter forward of the probehole entry location.

Please see Appendix A for individual gyroscope reports.

3.0 GAMMA AND MOISTURE SURVEYS

The gamma and moisture logs were collected according to approved procedures (PNG 2010). The surveys were recorded from the bottom of the probehole (maximum survey depth) to the ground surface. Zero depth reference is at the ground surface. A repeat measurement was acquired daily in at least one probehole to verify instrument repeatability. The main log and repeat intervals are presented on the same plot. The computed results of the main and repeat intervals were reviewed and for all of the intervals collected, the results agree within the uncertainty of the measurement counting statistics.

The survey results for each probehole are presented as a depth versus concentration plot in Appendix C. The plots are in numeric order of the probeholes (C8099 – C8100). Appendix C also contains a table summarizing data for each probehole: probehole depth, maximum concentration of Cs-137 in pCi/g, and maximum detected depth of Cs-137

3.1 GAMMA CALIBRATION AND SURVEYS

The spectral gamma scintillation detector uses a BGO crystal that is 2.54 cm [1 in.] diameter by 10.1 cm [4 in.] long. Other components of the gamma logging probe are the high-voltage supply, photo-multiplier tube, pre-amp, and multi-channel analyzer. The settings of the detector components are fixed (i.e., set up during assembly, prior to calibration) and cannot be adjusted by the field-logging engineer. The detector gain and lower threshold are set to record gamma ray activity with energies between 300 and 3000 keV. Lantern mantles containing Th-232 are used as a field verifier at the beginning and ending of each day's logging activities to check detector resolution (integrity) and energy calibration (amplifier gain).

The spectral gamma surveys were logged at 100 second per 0.5 ft. A spectrum of 256 channels was collected each 0.15 m (0.5 ft) from the bottom of the probehole to the surface. The spectra were recorded with one spectrum per file (filename extension: "-.chn") in Ortec[1] PHA format.

[1]Ortec is a registered trademark of EG&G Ortec, Gouda, Netherlands.

Spectra were processed to quantify the concentration of the naturally occurring radionuclides (K, U, & Th) and quantify Cs-137 when present above the minimum detection threshold. The minimum detection level (MDL) for Cs-137 is 1 pCi/g, in Hanford soils with nominal levels of radionuclides. The calibration certificate is shown in Figure 2. Also the gross gamma was calibrated to the industry standard of equivalent radium-226 (Eq.Ra) in pCi/g. Calibration was for the probehole conditions present at the investigation site.

3.2 NEUTRON MOISTURE CALIBRATION AND SURVEYS

The neutron moisture sonde combines the PNG-owned thermal-neutron detector and a DOE-owned sealed neutron source (50 mCi AmBe). The DOE-owned neutron source was used because it was already on the Hanford Site and was managed by the DOE Radiation Management Program. The neutron source is an integral component of a neutron moisture detector, manufactured by Campbell Pacific Nuclear, and is identified by the tool serial number H370608792.

The integrity of the sealed neutron source is always maintained when used in calibration and probehole logging activities. Source integrity is maintained by inserting the PNG-owned neutron detector module into the housing containing the sealed neutron source.

Calibration was performed in six borehole calibration models (Meisner and Randall 1995). Three of these models had a 15.24 cm (6-in.) hole size and three models had a 20.32 cm (8-in.) hole size. The moisture content was different for each borehole model within each set of three models (5, 12, and 20 percent by volume). The detector count rate in each of the six borehole calibration models is summarized in Table 1. The calibration certificate is shown in Figure 3. The calibration is specific to the exact combination of source, (H370608792) and detector (tool "SD-Moist792." The 792 at the end reflects the last three digits of the source serial number.

Table 1. Moisture Calibration Data.

Moisture Content Percent – volume fraction	6 inch Models[a] (cps)	8 inch Models[a] (cps)
5% vf	99.67	78.36
12% vf	146.15	110.59
20% vf	183.63	133.22

[a]Count rates are mean of 10 sample measurements at 60-sec each, 10/28/2010.

The probehole size for this project was 6.35 cm (2.5 in.) outside diameter (OD). Therefore, the moisture calibration was extrapolated to the correct hole size. Figure 4 shows the moisture calibration certificate for the 6.35 cm (2.5-in.) hole size.

The probehole moisture survey was collected at 0.30 m/min (1 ft/min). Processing of the survey data requires that the detector raw survey count rates to be corrected to the thickness of the steel casing present in the calibration models (0.325 in.) Given that the probehole casing thickness is 0.97 cm (0.38 in.), a correction factor of 1.055 is required to correct the observed neutron detector count rate to the conditions of the calibration model (Meisner et al. 1996).

Certificate of Calibration
SDGR.BGO.2
Nov 1, 2010

Data were taken at the Hanford KUT models on November 1, 2010. SDGR.BGO.2 is the designated Scintillator tool. Four models were used for Spectral KUT calibration. Ten spectra were recorded for each model in order to perform statistical analysis. The observed statistical deviations were seen to be within the theoretically predicted variation, refer to the files compressed: Stats.XLS for this analysis. The instrument was covered with 0.37 inch wall thickness probe tubing.

The algorithm described in the document WHC-SD-EN-TI-293, Rev. 0, determines the coefficient analysis. Three energy windows are used for each potassium, uranium and thorium (K U & T), and these are:

K: 1320-1575 keV **U: 1650-2390 keV** **T: 2475-2765 keV**

The concentration for each of the three elements is a linear combination of the count rates in the three windows. The resulting coefficients for each of the three elements are:

Concentration-K =	**4.745*K**	**-4.204*U**	**3.815*T**
Concentration-U =	**0.0*K**	**1.445*U**	**-2.839*T**
Concentration-T =	**0.0*K**	**-0.049*U**	**1.988*T**

Where K U & T are the count rates (c/s) in the listed energy windows and the resulting concentration values are in pCi/g.

Digital files condensed as Cal_SD-GR-2_2010-v0.zip. This compressed file contains:

- Calibration raw data
- MathCad data analysis files
- Spreadsheet data formatting

The undersigned certifies that the data archived in the file "Cal_SD-GR-2_2010-v0.zip" were collected and evaluated in accordance with procedures WHC-SD-EN-TI-293, "Procedures for Calibrating Scintillation Gamma-Ray Well Logging Tools Using Hanford Formation Models" and that the above stated calibration coefficients are correct and applicable for the tool SDGR.BGO.2 effective Nov 1, 2010.

Signature: Date: November 9, 2010

Company: Three Rivers Scientific

Figure 2. BGO Calibration Certificate.

Figure 3. Moisture Calibration Certificate, 15.24 cm (6-in.) and 20.32 cm (8-in.) Hole.

Certificate of Calibration for
Instrument SD-Moist792

October 28, 2010

Data were taken in the Moisture models on October 28, 2010 for SD-Moist792 neutron-neutron moisture tool. The neutron source from DOE moisture tool # H370608792 was used with the passive neutron detector probe from PNG.

Six models were used for moisture calibration, 3 for 6"casing and 3 for 8" casing. Repeated spectra were recorded for each model in order to perform statistical analysis. The observed statistical variation agreed with the theoretically predicted variation; refer to the file MoistCal.xls for this analysis.

The coefficient generation is determined by the algorithm described in the document WHC-SD-EN-TI-306, Rev. 0. The regression function used is a power law form and defined by:

$$V = a \cdot CR^{\alpha}$$

Where V is the formation moisture content in volume fraction water in vf units. One vf unit is 1% by volume water. The coefficients a and α are fit coefficients, and CR is the deadtime corrected observed total count rate, (c/s).

6" casing	**8" casing**
a = .0001582	**a = .00006587**
α = 2.251	**α = 2.575**

The undersigned certifies that the data archived in data file "SD-Moist792_2010.zip" were collected and evaluated in accordance with procedures WHC-SD-EN-TI-306, "Radionuclide Logging System In Situ Vadose Zone Moisture Measurement Calibration" and that the above stated calibration coefficients are correct and applicable for tool SD-Moist792, effective October 28, 2010.

Signature: Date:

November 9, 2010

Russel Randall, PhD
Three Rivers Scientific

Figure 4. Moisture Calibration Certificate, 6.35 cm (2.5-in.) Hole.

Moisture Calibration Extrapolation to 2.5 Inch Borehole
Instrument SD-Moist792

October 28, 2010

Moisture calibration was performed in the Hanford physical models. These standards have 6 and 8 inch ID casings. The Tank Farm Direct Push borehole is cased with a 2.5 inch OD iron casing. The calibration for the moisture response is a function of borehole diameter.

The coefficient generation is determined by the algorithm described in the document WHC-SD-EN-TI-306, Rev. 0. The regression function used is a power law form and defined by:

$$V = a \cdot CR^{\alpha}$$

Where V is the formation moisture content in volume fraction water in vf units. One vf unit is 1% by volume water. The coefficients a and α are fit coefficients, and CR is the deadtime corrected observed total count rate, (c/s). A linear extrapolation was applied to determine the 2.5 inch borehole diameter.

2.51" borehole
a = .0002531
α = 1.998

The undersigned certifies that the analysis files are archived in the file "SD-Moist792_2010.zip" was evaluated in accordance with Energy Solutions procedures and that the above stated calibration coefficients are correct and applicable for tool SD-Moist792, effective October 28, 2010.

Signature: Date:

November 9, 2010

Russel Randall, PhD
Three Rivers Scientific

4.0 REFERENCES

Meisner, James and Russel Randall, 1995, *Vadose Zone Moisture Measurement Through Steel Casing Evaluation*, WHC-SD-EN-TI-304, Rev.0, Westinghouse Hanford Company, Richland, Washington.

Meisner, James, Randall Price, and Russel Randall, 1996, *Radionuclide Logging System In Situ Vadose Zone Moisture Measurement Calibration*, WHC-SD-EN-TI-306, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

PNG, 2010, *Procedures: Calibration, Logging, Quality Assurance and Data Management*, Pacific Northwest Geophysics, Kennewick, Washington.

Randall, R. and D. Stromswold, 1995, *Procedures for Calibrating Scintillation Gamma-Ray Well Logging Tools Using Hanford Formation Models*, WHC-SD-EN-TI-293, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A
GYROSCOPE SURVEY RESULT DETAILS

Up to four gyroscope surveys define a set of surveys (during the same day). A constant azimuth value is used for all survey sets (source is GPS survey points to orient the foot plate, six meters behind and one meter forward of the borehole entry location, azimuth. The azimuth (bearing) of C 8099 and C 8100 was plotted at 63 degrees from true north. The dip of the drive casing was measured (via digital angle gauge) for each set of gyroscope surveys (the target dip is 60 degrees below horizontal, i.e. 30 degrees from vertical).

The four tables and two plots below present the detail results for the two probeholes (C8099 and C8100) installed under tank C-104 (two tables per probehole). The first table shows the GPS and offset (delta) coordinates for the target borehole path. The second table presents the survey end-point coordinates for each gyroscope survey (relative to the probehole starting location). The data for probehole C8099 are presented in the first two tables and the data for C8100 are presented in the last two tables. The casing (pipe run) in C 8099 was driven to a total length of 221.3 feet. The borehole gyroscope would not pass a pipe run length of 173 feet because of a bend/deviation in the pipe. Collected data only extends to 170+ feet of pipe run and the path of the pipe is projected in Gyroscope Results and Projection for C8099 by Dr. Randall below. For probehole C8100 the data sets show a repeated section that is the result of the tubing be extracted and re-driven after collection of data on 3/8/2011 at 56+ feet below ground surface.

The plots (one per probehole) are the 3D view that compares the target path (blue line) with the actual probehole path (red line). The black dots are the coordinates for the probehole starting and ending locations as well as the intermediate gyroscope survey locations. The rectangle at the surface (wide gray line at 0 feet) encloses the surface area of the target probehole path. The red line at the surface is the plan view projection of the actual probehole path. The brown dashed-line rectangle encloses the target probehole projection from the top (surface) to its total depth.

Table A1 Probehole C8099 - GPS Coordinates of Target Borehole

Probehole	Gyro Survey Pipe-Run (ft)	Northing (m)	Easting (m)	Elevation (ft)	Δ North=Y -S / +N (ft)	Δ East=X -W / +E (ft)	Δ Elev.=Z -(Deep) / +(Shallow) (ft)
		Target Path			Distance from Start Coordinates		
C8099	Surface	136514.24	575116.69	664.00			
C8099	27.7	136516.15	575120.48	640.00	6.27	12.43	-24.00
C8099	56.58	136518.14	575124.40	615.00	12.80	25.30	-49.00
C8099	66.66	136518.69	575125.50	608.00	14.60	28.90	-56.00
C8099	173.1 (a)	136526.18	575140.24	514.09	39.17	77.28	-149.91
C8099	252.88	136531.68	575151.10	445.00	57.22	112.89	-219.00

(a) Gyro probe encountered refusal at 173.1 ft. Target Coordinates at 252.88 are included for information purposes..

Table A2 Probehole C8099- Individual Gyroscope Survey Results

	Gyro Survey End-Point Results						Difference (Survey - Target)			Distance to Target	
Date	Pipe-Run (ft)	North Offset (ft)	East Offset (ft)	Elev. Offset (ft)	Dip (Deg)	Azimuth (Deg)	North -S / +N (ft)	East -W / +E (ft)	Elev -(Deep) / +(Shallow) (ft)	(ft)	(m)
Target End-Points		**6.27**	**12.43**	**-24.00**			Dip = 59.9 Deg at top probehole				
1/13/2011	27.68	6.15	12.41	-23.96	-59.95	63.39	-0.11	-0.02	0.04	0.12	0.04
	27.70	6.21	12.50	-23.93	-59.84	63.56	-0.06	0.06	0.07	0.11	0.03
	27.71	6.23	12.40	-23.98	-59.88	63.18	-0.03	-0.04	0.02	0.05	0.02
	27.69	6.25	12.40	-23.96	-59.78	63.16	-0.02	-0.04	0.04	0.06	0.02
Average	**27.70**	**6.21**	**12.43**	**-23.96**	**-59.86**	**63.32**	**-0.06**	**0.01**	**0.04**	**0.09**	**0.02**
Target End-Points		**12.80**	**25.30**	**-49.00**			Dip = 60.0 Deg at top probehole				
1/28/2011	56.61	13.07	25.48	-48.83	-58.74	62.94	0.27	0.19	0.17	0.37	0.11
	56.57	12.88	25.52	-48.82	-58.74	63.53	0.08	0.22	0.18	0.30	0.09
	56.60	12.99	25.58	-48.79	-58.65	63.29	0.19	0.29	0.21	0.40	0.12
	56.60	13.01	25.55	-48.80	-58.69	63.19	0.22	0.26	0.20	0.39	0.12
Average	**56.60**	**12.99**	**25.53**	**-48.81**	**-58.71**	**63.24**	**0.19**	**0.24**	**0.19**	**0.37**	**0.11**
Target End-Points		**14.60**	**28.90**	**-56.00**			Dip = 59.7 Deg at top probehole				
1/31/2011	64.63	14.85	29.49	-55.56	-58.25	63.47	0.25	0.58	0.44	0.77	0.24
	64.70	14.86	29.46	-55.65	-58.23	63.34	0.26	0.55	0.35	0.70	0.21
	64.59	14.85	29.30	-55.61	-58.15	63.14	0.25	0.40	0.39	0.61	0.19
	64.67	14.82	29.40	-55.66	-58.06	63.32	0.22	0.49	0.34	0.64	0.20
Average	**64.65**	**14.85**	**29.41**	**-55.62**	**-58.17**	**63.32**	**0.25**	**0.51**	**0.38**	**0.68**	**0.21**
Target End-Points		**39.17**	**77.28**	**-149.91**	**Probe Refusal**		Dip = 59.9 Deg at top probehole				
2/7/2011	173.11	45.10	84.22	-144.03	-48.48	57.69	5.93	6.95	5.87	10.86	3.31
	173.12	45.45	84.62	-143.68	-48.24	57.62	6.29	7.34	6.23	11.50	3.50
	173.07	45.16	84.63	-143.72	-48.30	57.66	5.99	7.35	6.19	11.33	3.45
	173.13	45.40	84.59	-143.73	-48.31	57.33	6.23	7.31	6.18	11.42	3.48
Average	**173.11**	**45.28**	**84.52**	**-143.79**	**-48.33 (b)**	**57.58 (b)**	**6.11**	**7.24**	**6.12**	**11.28**	**3.44**

(b) Significant end-point drift at 173ft; Dip=-48.3 Deg and Azimuth=57.58 Deg.

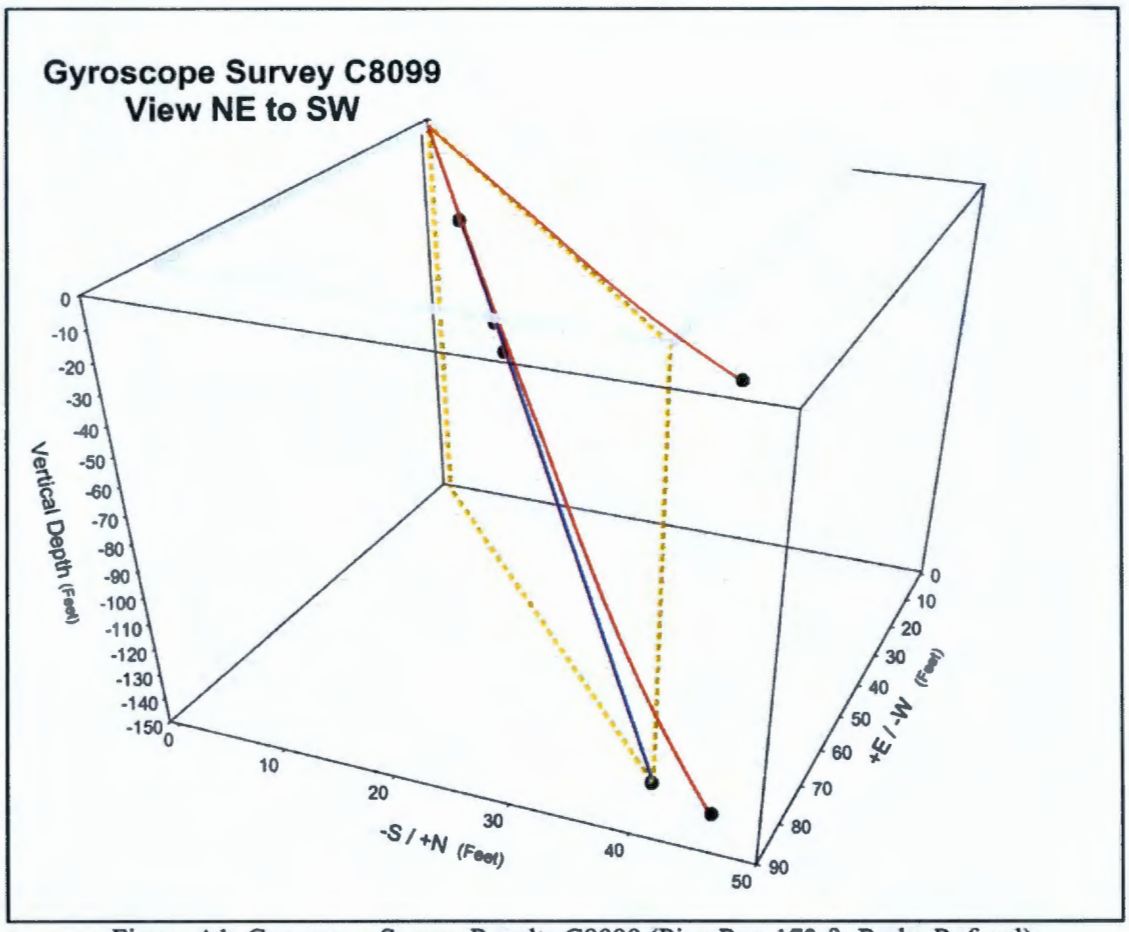


Figure A1 Gyroscope Survey Results C8099 (Pipe Run 173 ft, Probe Refusal)

Table A3. Probehole C8100 - GPS Coordinates of Target Probehole

Probehole	Gyro Survey Pipe-Run (ft)	Northing (m)	Easting (m)	Elevation (ft)	Δ North=Y -S / +N (ft)	Δ East=X -W / +E (ft)	Δ Elev=Z -(Deep) / +(Shallow) (ft)
		Target Path			Distance from Start Coordinates		
C8100	0	136515.05	575116.28	664.00			
C8100	27.7	136516.98	575120.06	640.00	6.33	12.40	-24.00
C8100	56.58	136518.97	575123.98	615.00	12.86	25.26	-49.00
C8100	66.66	136519.53	575125.07	608.00	14.70	28.84	-56.00
C8100	220.0 (c)	136530.17	575146.24	473.47	49.61	98.30	-190.53
C8100	252.88	136532.43	575150.72	445.00	57.02	112.99	-219.00

(c) Drill Rig encountered refusal at 220 ft. Target Coordinates at 252.88 are included for information purposes..

Table A4 Probehole C8100 – Individual Gyroscope Survey Results

	Gyro Survey End-Point Results						Difference (Survey - Target)			Distance to Target	
Date	Pipe-Run (ft)	North Offset (ft)	East Offset (ft)	Elev Offset (ft)	Dip (Deg)	Azimuth (Deg)	North -S / +N (ft)	East -W / +E (ft)	Elev -(Deep) / +(Shallow) (ft)	(ft)	(m)
Target End-Points		6.33	12.40	-24.00			Dip = 60.6 Deg at top probehole				
3/2/2011	27.69	6.28	12.15	-24.08	-60.10	62.09	-0.05	-0.25	-0.08	0.27	0.08
	27.70	6.24	12.11	-24.12	-60.37	62.38	-0.09	-0.29	-0.12	0.33	0.10
	27.71	6.25	12.11	-24.13	-60.37	62.49	-0.09	-0.29	-0.13	0.33	0.10
	27.71	6.25	12.13	-24.12	-60.27	62.34	-0.08	-0.27	-0.12	0.31	0.09
Average	**27.70**	**6.26**	**12.13**	**-24.11**	**-60.28**	**62.33**	**-0.08**	**-0.28**	**-0.11**	**0.31**	**0.09**
Target End-Points		12.86	25.26	-49.00			Dip = 60.7 Deg at top probehole				
3/7/2011	56.60	12.95	24.82	-49.19	-59.85	62.71	0.09	-0.44	-0.19	0.49	0.15
	56.70	13.18	24.99	-49.16	-59.39	61.59	0.32	-0.27	-0.16	0.45	0.14
	56.59	13.12	24.92	-49.09	-59.71	62.19	0.26	-0.35	-0.09	0.44	0.14
	56.60	13.10	25.02	-49.06	-59.44	62.55	0.24	-0.25	-0.06	0.35	0.11
Average	**56.62**	**13.09**	**24.94**	**-49.13**	**-59.60**	**62.26**	**0.23**	**-0.33**	**-0.13**	**0.43**	**0.14**
Target End-Points		14.70	28.84	-56.00			Dip = 60.5 Deg at top probehole				
3/8/2011	64.58	15.09	28.42	-55.99	-59.28	61.82	0.39	-0.42	0.01	0.57	0.17
	64.70	15.24	28.39	-56.10	-59.37	61.91	0.54	-0.44	-0.10	0.71	0.22
	64.65	15.26	28.50	-55.99	-59.19	61.90	0.56	-0.34	0.01	0.65	0.20
	64.68	15.28	28.47	-56.03	-59.29	61.88	0.58	-0.37	-0.03	0.69	0.21
Average	**64.65**	**15.22**	**28.45**	**-56.03**	**-59.28**	**61.88**	**0.52**	**-0.39**	**-0.03**	**0.66**	**0.20**
Target End-Points		12.86	25.26	-49.00			Dip = 60.75 Deg at top probehole				
3/15/2011	56.63	13.17	24.90	-49.12	-59.44	61.79	0.31	-0.37	-0.12	0.50	0.15
	56.61	13.13	24.95	-49.08	-59.45	61.93	0.27	-0.31	-0.08	0.42	0.13
	56.60	13.17	25.01	-49.04	-59.31	61.94	0.30	-0.25	-0.04	0.39	0.12
	56.61	13.20	24.94	-49.07	-59.43	61.86	0.33	-0.32	-0.07	0.47	0.14
Average	**56.61**	**13.17**	**24.95**	**-49.08**	**-59.41**	**61.88**	**0.30**	**-0.31**	**-0.08**	**0.45**	**0.14**
Target End-Points		36.53	72.39	-140.30			Dip = 60.6 Deg at top probehole				
3/22/2011	162.04	41.24	73.78	-138.16	-55.26	56.62	4.71	1.40	2.14	5.36	1.63
	161.96	40.93	73.85	-138.13	-55.39	56.91	4.40	1.46	2.17	5.12	1.56
	162.02	41.20	73.80	-138.14	-55.49	56.82	4.67	1.41	2.15	5.34	1.63
Average	**162.01**	**41.12**	**73.81**	**-138.14**	**-55.38**	**56.78**	**4.59**	**1.42**	**2.15**	**5.27**	**1.61**
Target End-Points		49.61	98.30	-190.53	Drill Refusal		Dip = 60.6 Deg at top probehole				
3/28/2011	220.06	61.09	103.28	-184.03	-51.63	51.35	11.48	4.98	6.50	14.10	4.30
	220.01	61.63	103.51	-183.65	-51.46	51.59	12.02	5.21	6.87	14.80	4.51
	220.03	60.60	103.95	-183.76	-51.52	51.80	11.00	5.65	6.76	14.09	4.29
Average	**220.03**	**61.11**	**103.58**	**-183.81**	**-51.54 (d)**	**51.58 (d)**	**11.50**	**5.28**	**6.71**	**14.33**	**4.37**

(d) Significant end-point drift at 220ft; Dip=-51.5 Deg and Azimuth=51.6 Deg.

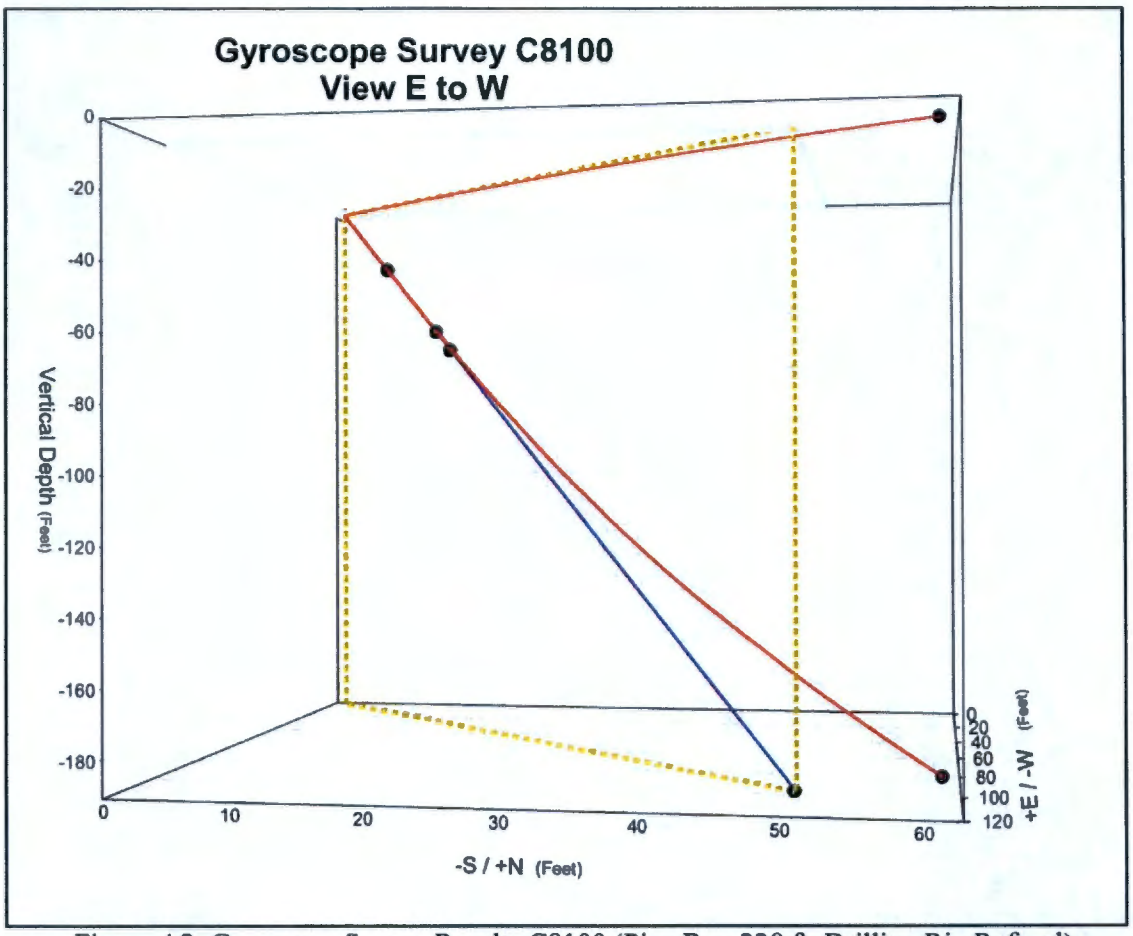


Figure A2 Gyroscope Survey Results C8100 (Pipe Run 220 ft, Drilling Rig Refusal)

Gyroscope Results and Projection for C8099
Russ Randall, PhD
Feb 23, 2011

Introduction

Energy Solutions conducted slant direct push operations to collect data adjacent to and under tank C-104, borehole ID C8099, in the C tank farm. The starting pipe dip angle was -60° from horizontal, 30° from vertical. The starting azimuth was 63° from North. The dip angle began changing at about 10 feet of pipe length (vertical depth 8.66 feet) and continued to change to a measured pipe length of 173 feet (143.7 feet vertical). The azimuth angle remained fairly constant until about 135 feet of pipe length. At this point the azimuth angle began changing from the 63^0 degree planned bearing and began deviation to the north. The borehole was pushed to a total of 255 feet pipe length. The gyroscope stopped at a pipe length of approximately 173 and would not pass to bottom because of a localized deviation in the pipe calculated to be greater than $.2^0$.

This report describes the projection of gyroscopic data to predict the coordinates of the end point of the pipe.

Method of Projection

Four sets of gyroscope log surveys were conducted at various depths during the push operations. During the collection of the final data set at a total pipe length of 255+ feet the tool could not get past the deviation/bend at 173 feet of pipe run. Four sets of data were collected from surface to 173 feet. Table 1 contains the coordinates for each survey end point closest to 173 feet. The average is also provided in the last row.

Table 1. Gyroscopic Coordinates for Four Different Surveys

log run	Depth	Northing	Easting	Elevation	Dip	Azimuth
D4	173.034	45.36	84.54	-143.67	-48.34	57.33
D3	173.016	45.14	84.6	-143.68	-48.32	57.66
D2	173.012	45.42	84.56	-143.61	-48.28	57.62
D1	173.002	45.06	84.16	-143.95	-48.51	57.68
mean	173.016	45.25	84.47	-143.73	-48.36	57.57

The units for Depth, Northing, Easting, and Elevation are in feet. The dip and azimuth are in degrees. The distances are referenced from the starting point of the push. Using the mean values, the end point of the log data is:

- True vertical depth of 143.7ft down from surface
- Horizontal distance towards the east of 84.5 ft from start point
- Horizontal distance towards the north of 45.2 ft from start point

Because the borehole was pushed to a pipe run depth of 255 feet, an additional 82 feet of pipe exists beyond the end point of the gyroscopic data listed in Table 1. Because the gyroscope could not pass beyond the 173 foot pipe run depth, a projection of the push end point coordinates was calculated, assuming that the dip and azimuth angles continue to change at the rate observed at the end of the final surveys. Figure 1 shows the dip angles as a function of pipe depth over the 173 feet of gyroscopic data.

Figure 2 Gyroscopic Log Data

The dip angle from about 135ft to the end at 173ft is changing at a relatively constant rate of change. The dip data from 135-173 ft were least square fit for a linear rate of change. This same rate of change was then used to continue the projection out to the pipe end of 255ft. The azimuth angle was observed to remain relatively constant over the first 100 feet of pipe with an onset of constant angle change with pipe depth from 135-173 ft. Likewise, the azimuth data were least square fit for a linear change and this rate was used in the projection to the end of pipe.

Figure 2 is a 3D plot of the length of pipe using gyroscopic data from surface to 173 ft and the above projections for the remainder of pipe length. These data and projections are plotted in

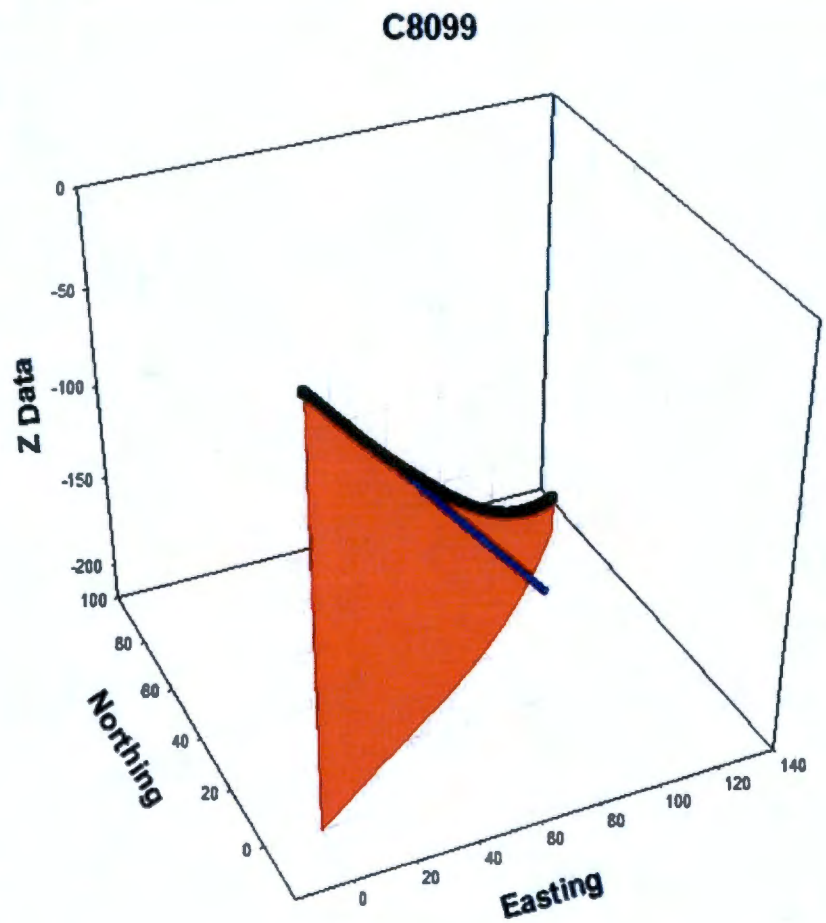


Figure 3 Borehole path

black, and the straight line projection with the target path is plotted in blue. The black data points of the borehole-path have added red drop lines straight down to the x-y plane (Easting-Northing relative coordinates). This yields a visualization of the x-y path.

Table 2 contains the relative coordinates of the projected and target end points of the pipe, given a pipe run depth of 254.97ft as observed. The original design called for a slightly less pipe run depth than what occurred.

Table 2. End Point Projection

Coordinate	Projected End Point (ft)	Straight Push Endpoint	Original Designed
pipe length	254.97	254.97	252.88
Easting	131.665	113.59	112.66
Northing	81.783	57.88	57.40
Elevation	-199.478	-220.81	-219.00

While the assumption of a constant rate of change in dip and azimuth is reasonable, it is known that at 173ft there is a bend/deviation in the pipe which was sufficient in displacement to not allow the gyroscope to pass. A pipe deviation (known to be greater than 0.2° over a 6 foot length) occurred at this pipe length. A variance in offset angles was estimated at this point. The direction of the kick or bend is not known, thus a possible kick in both up and down as well as left and right were calculated.

The basis of estimating this kick angle is the following:

- The minimum kick angle is 0.2° due to the gyroscopic tool length and drift angle inside the push pipe.
- The pipe cannot experience too large of a bend and retain integrity (e.g. not collapse, refuse to advance or cause a bend sufficient to not allow retrieval). The estimated maximum non catastrophic bend is 0.5°.

A cone of projection can be computed using the additional assumption of a one-time kick in the angles. Table 3 has the coordinates for the four extremes of the projected cone and the center point estimated and listed in Table 2. Table 3 also contains the coordinates of the four extremes of this cone. The last column of Table 3 contains what the end point coordinates would have been if there had been no change in original angles.

Table 3. Projection of pipe end point and tolerance

Coordinate	Center	Z top	Z bottom	Azimuth +	Azimuth-	Straight
pipe length	254.97	254.97	254.97	254.97	254.97	254.97
Easting	131.665	132.045	131.282	131.345	131.982	113.59
Northing	81.783	82.074	81.49	82.193	81.37	57.88
Elevation	-199.478	-198.954	-199.997	-199.478	-199.478	-220.81

Conclusion

Coordinates of the end of pipe for C8099 cannot be measured due to a bend in pipe at 173 feet which would not allow the gyroscopic tool to pass. A projection of the possible end point

coordinate was calculated assuming angle changes continuing as measured over the deepest 38 ft (135-173 ft) of gyroscopic data, and a projection of possible variance of this end point due to an addition 0.5° kick at the bend of 173ft of pipe was computed. As shown in Table 3, it is clear the variance of a 0.5° kick is insignificant when compared to the possible changes in dip and azimuth angles. Variance of the dip and azimuth from the assumed constant rates of change will affect the final coordinates much more than a bend at 173ft of pipe.

APPENDIX B
SPECTRAL GAMMA AND MOISTURE SURVEY RESULTS

Survey plots follow for the two angle probeholes installed for Tank C-104 Characterization. Probehole C8099 was surveyed with both the BGO spectral gamma and moisture probes. Probehole C8100 was surveyed with the moisture probe. Each log plot is preceded by a header information page that shows the probehole coordinates, repeat/overlap intervals, isotopes analyzed, observations, and logging probe calibration dates. The log plots show a maximum of 100 feet per page with a 10 ft overlap between page breaks.

The spectral gamma survey data were processed to quantify the naturally occurring radionuclides (K, U, & Th), and the man-made radionuclide of Cs-137 (blue solid line). The spectra were processed both as individual spectra for each survey depth and as a moving sum of three spectra (i.e. sum of the individual survey depth and the two adjacent spectra, above and below the current depth position). Both results are presented on the results plot. The results for the 3-spectra sum are plotted as a wide line. Also the gross gamma was calibrated to the industry standard of equivalent radium-226 (Eq.Ra) in scale of 2 to 6 pCi/g (brown line).

The neutron-neutron moisture survey data are shown with a blue line. The moisture plot scale is 0-30 (% vf).

Table C1 below contains a summary of the survey results for each probehole: maximum log depth, maximum detection level for Cs-137, maximum depth of Cs-137 detection, and special observations by the analyst to flag the detection of other isotopes in additions to the natural radionuclides and Cs-137.

Table C1. Probehole Survey Summary.

Probehole ID.	Hole Depth (meters)	Hole Depth (feet)	Cs-137 (pCi/g) Max Detection	Cs-137 Max Detected Depth	Flag Isotopes Other Than Naturals and Cs-137
C8099	77.7	255	5.8 pCi/g at surface	17 ft	None
C8100	67.1	220	n/a	n/a	n/a

C-FARM C8099 HEADER INFORMATION

Small Diameter – Spectral Gamma & Moisture Survey

Probehole:	C8099	Northing:	136514.24	Depth Ref:
Log Date:	Feb 2011	Easting:	575116.69	Ground Surface
Project:	C Farm	Elevation:	202.39m	

Repeat/Overlap Intervals

Spectral: 255-252
184-178

Moisture: 255-247

Isotopes Analyzed

Elements:	Energies Used (keV)
K-40	1462
Natural Uranium	1650-2390
Natural Thorium	2614
Cs-137	661

Observations

-Spectral:

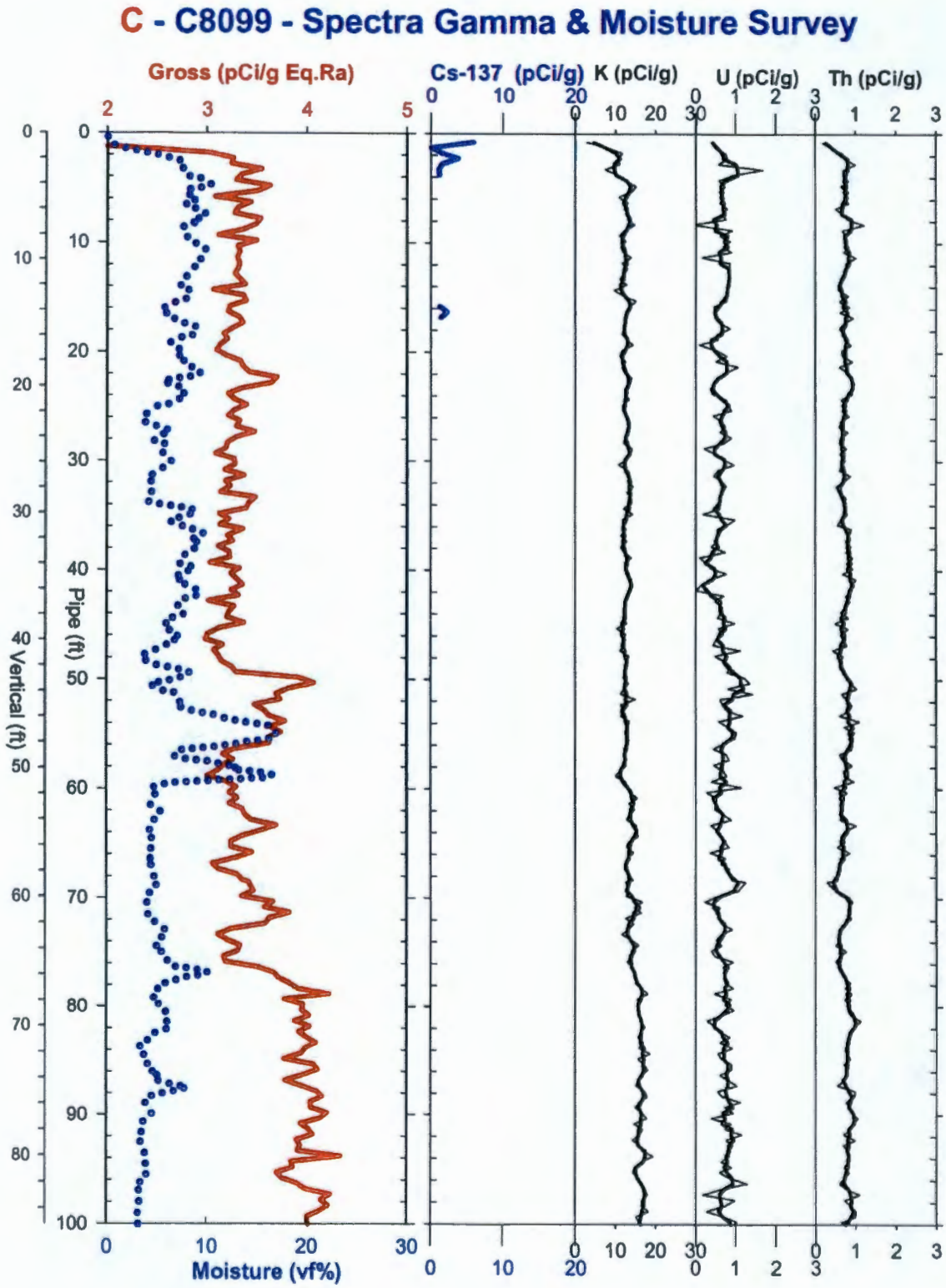
Cs-137 was observed at the surface, with a maximum of 5.8 pCi/g, and over depth of 17-16ft with a maximum of 2.2 pCi/g. The plotted gross uses an energy threshold of 1000keV, and does not respond to Cs-137. Thin bed responses are washed out in both depth resolution and magnitude of response change when the beds are aligned at an angle different from perpendicular to the borehole.

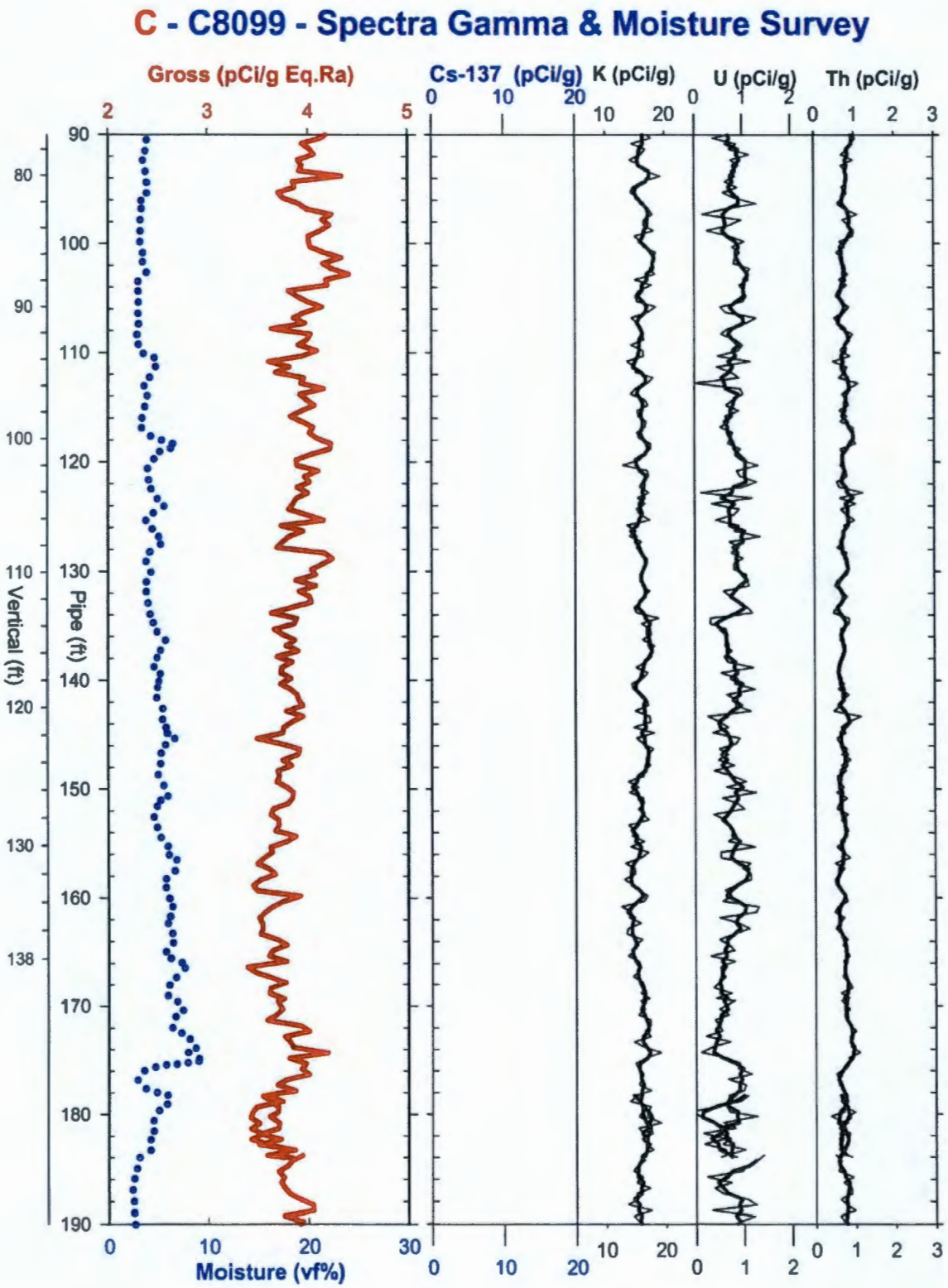
Moisture:

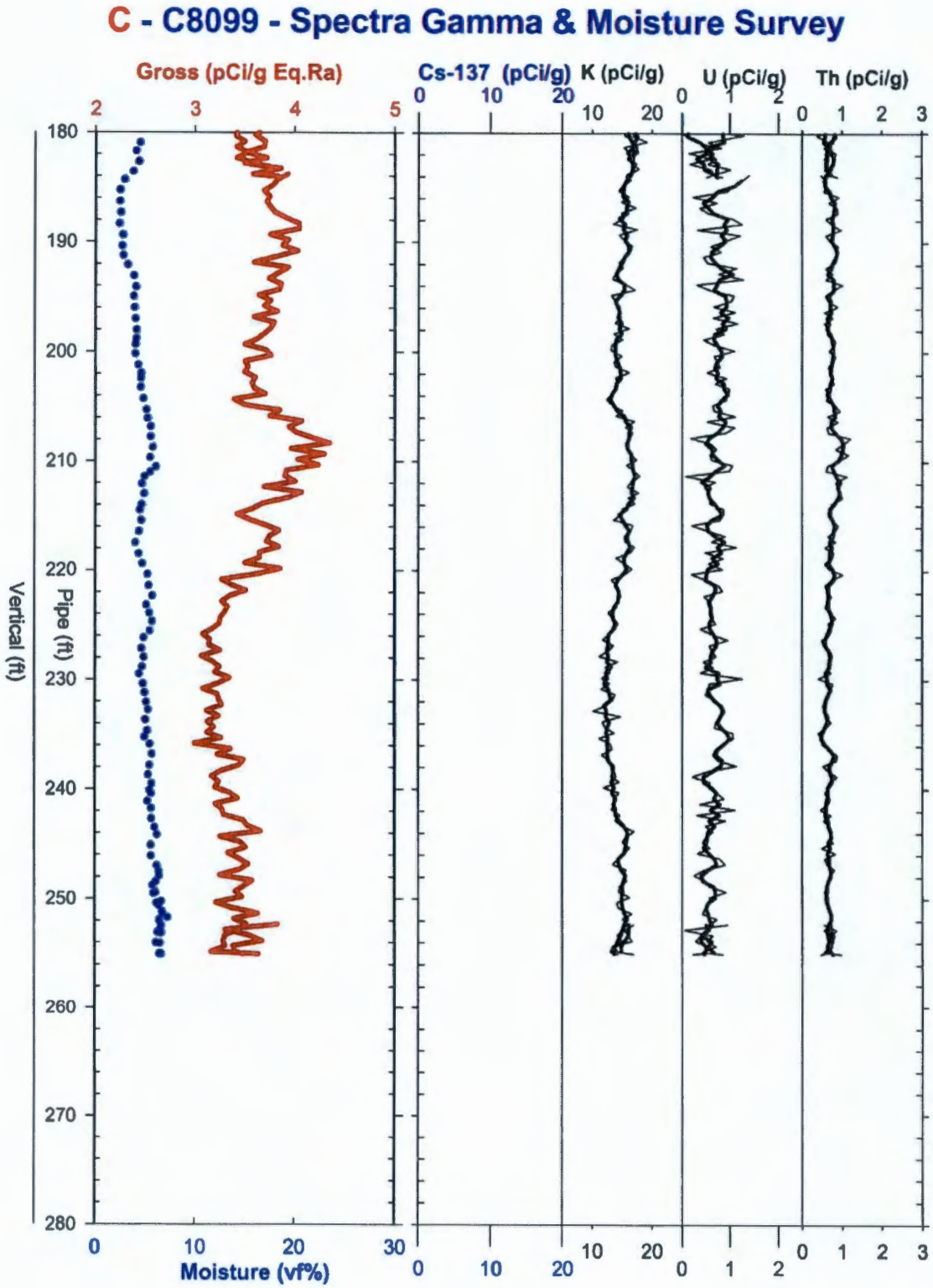
Moisture values range from 2.3-17%. Thin bed responses are washed out in both depth resolution and magnitude of response change when the beds are aligned at an angle different from perpendicular to the borehole.

Calibration Certificates

Spectral	
Date:	Nov 1, 2010
Electronic File:	Cal_SD-GR-2_2010-v0.zip
Moisture	
Date:	Oct 28, 2010
Electronic File:	SD-Moist792_2010.zip


C - C8099 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Vertical (ft)
Pipe (ft)
Moisture (vf%)


C - C8099 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Vertical (ft)
Pipe (ft)
Moisture (vf%)


C - C8099 - Spectra Gamma & Moisture Survey
Gross (pCi/g Eq.Ra)
Cs-137 (pCi/g)
K (pCi/g)
U (pCi/g)
Th (pCi/g)
Vertical (ft)
Pipe (ft)
Moisture (vf%)

C-FARM C8100 HEADER INFORMATION

Small Diameter – Moisture Survey

Probehole:	C8100	Northing:	136515.05	Depth Ref:
Log Date:	Mar 2011	Easting:	575116.28	Ground Surface
Project:	C Farm	Elevation:	202.39	

Repeat/Overlap Intervals

Spectral:	none	Moisture:	125-120
			125-120

Observations

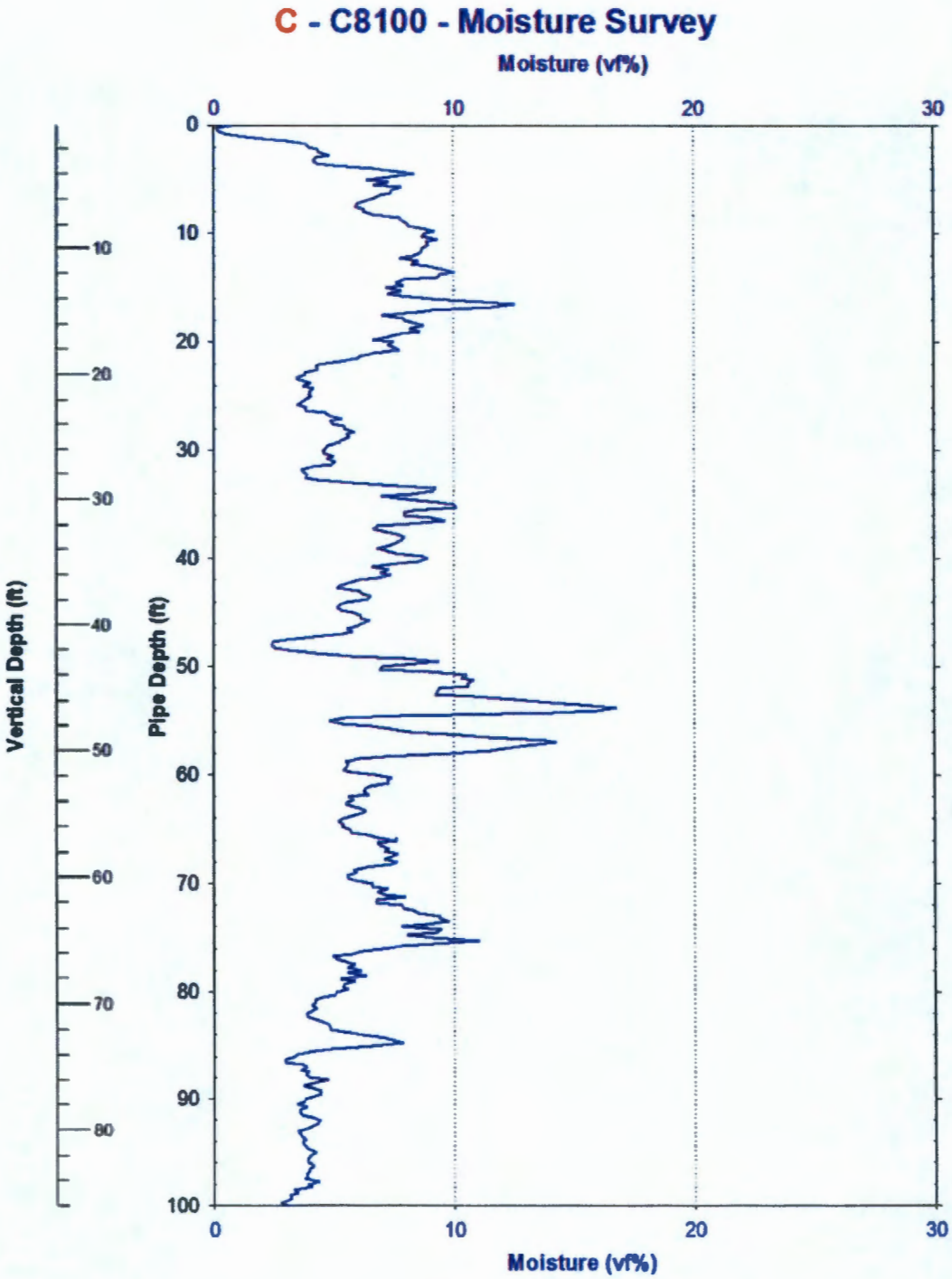
Moisture:

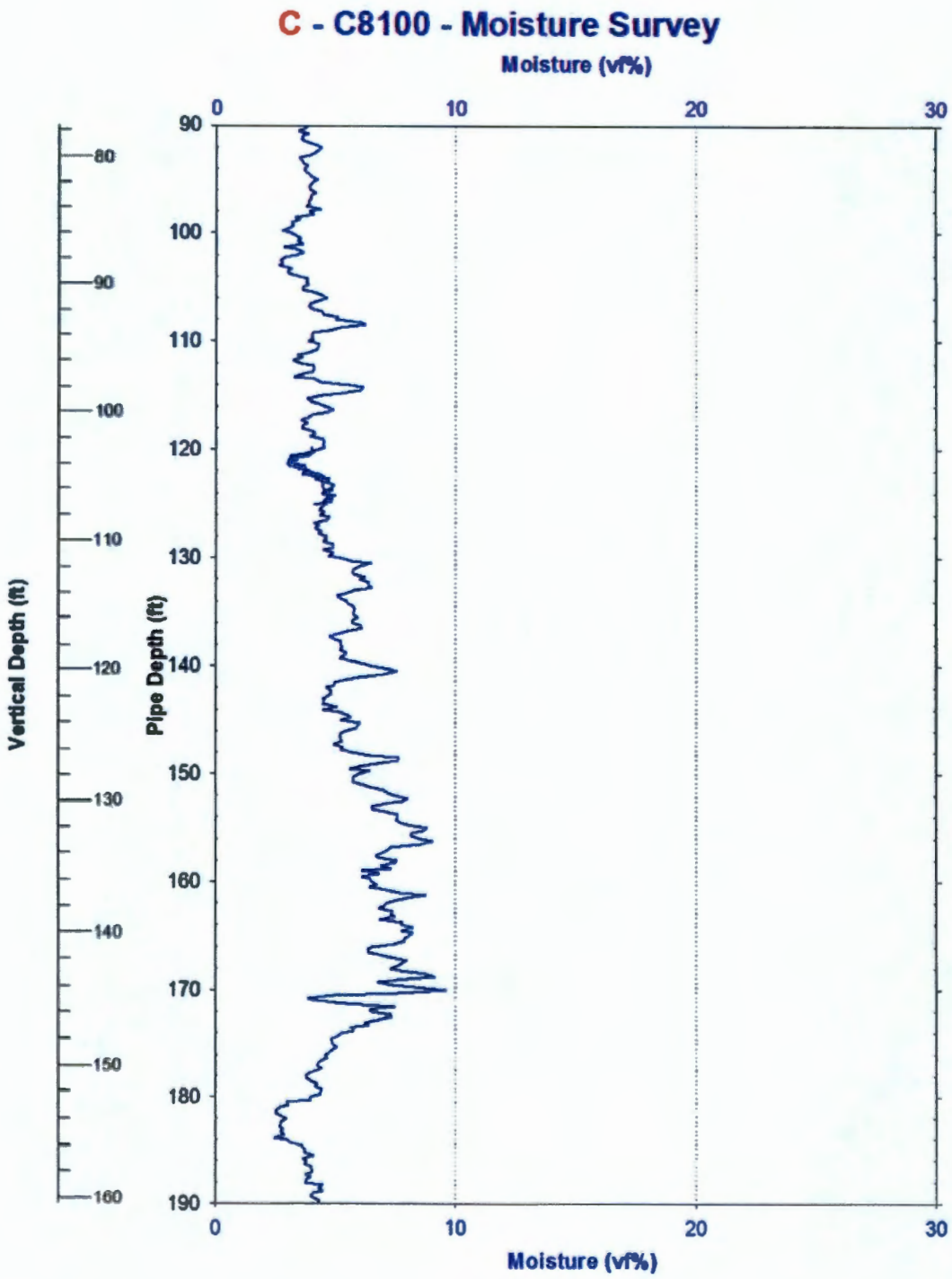
Moisture values range from 2.4-15.9%. Thin bed responses are washed out in both depth resolution and magnitude of response change when the beds are aligned at an angle different from perpendicular to the borehole. Several relatively thin zones have noted variations (16, 54, 58, 170 ft for examples), thus the actual variations are predicted to be stonger.

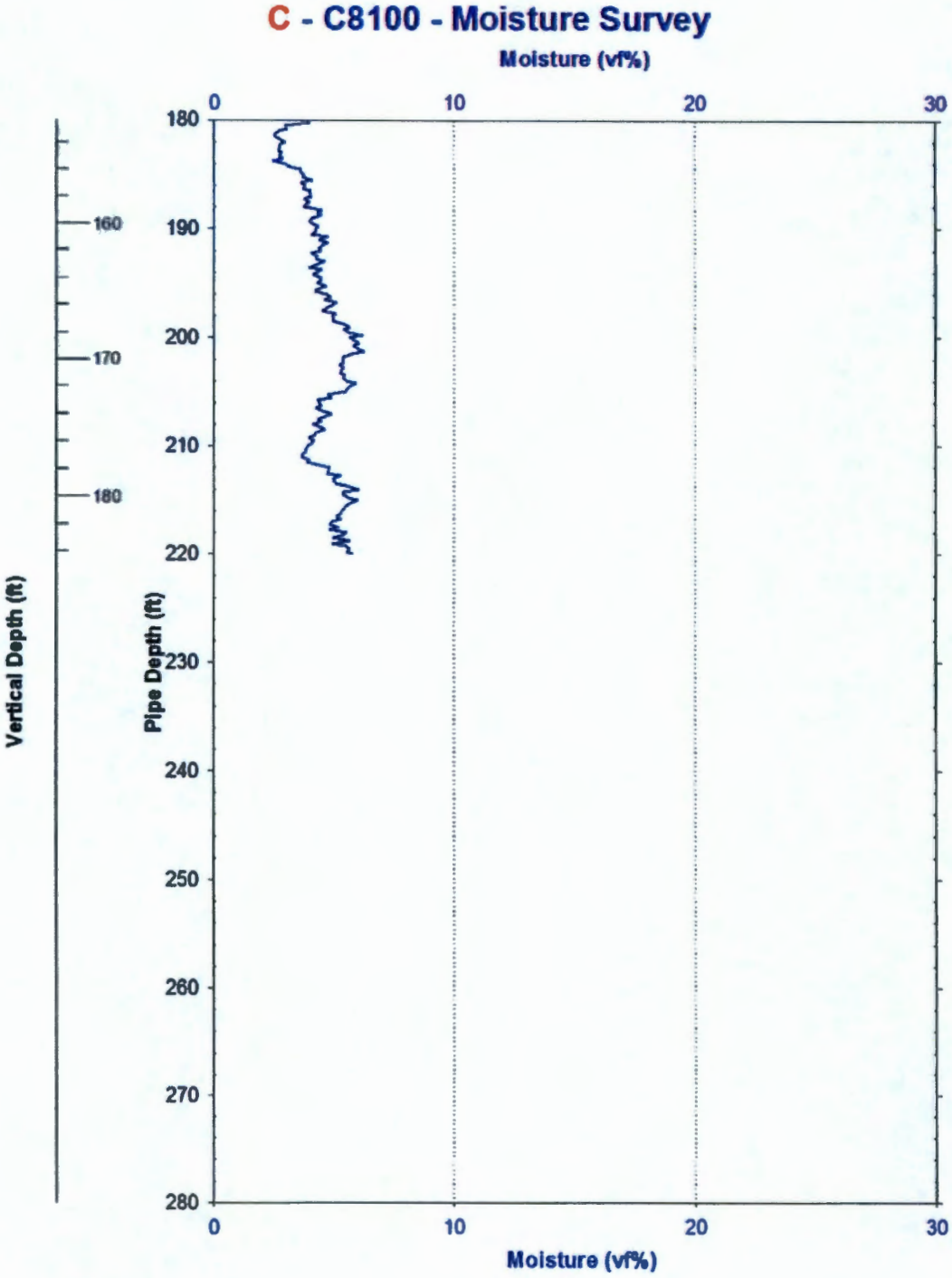
Calibration Certificates

Moisture

Date:	Oct 28, 2010
Electronic File:	SD-Moist792_2010.zip


C - C8100 - Moisture Survey
Moisture (vf%)
0
10
20
30
Vertical Depth (ft)
10
20
30
40
50
60
70
80
Pipe Depth (ft)
0
10
20
30
40
50
60
70
80
90
100
Moisture (vf%)


C - C8100 - Moisture Survey
Moisture (vf%)
0
10
20
30
Vertical Depth (ft)
80
90
100
110
120
130
140
150
160
Pipe Depth (ft)
90
100
110
120
130
140
150
160
170
180
190
Moisture (vf%)


C - C8100 - Moisture Survey
Moisture (vf%)
0
10
20
30
180
190
200
210
220
230
240
250
260
270
280
Pipe Depth (ft)
Vertical Depth (ft)
160
170
180
Moisture (vf%)

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APPENDIX E

SAMPLE DETERMINATION MEETING MINUTES

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MEETING NOTES
Waste Management Area C Sample Depth Selection for Location J (C8100) Angle Push Under C-104

Meeting Date: February 15, 2011

Location: 1200 Jadwin, Room 3-C3

Purpose: Determine Sample Depths for Location J

Attendees:

Harold Sydnor (WRPS)	Dave Myers (WRPS)
Joe Caggiano (Ecology)	Kent Reynolds (Energy Solutions)
Marcel Bergeron (WRPS)	Susan Eberlein (WRPS)
Mike Connelly (WRPS)	Cindy Tabor (WRPS)
Dwayne Crumpler (CEES)	Andrew Templeton (WRPS)
Les Fort (WRPS)	Bob Lober (DOE-ORP)
Beth Rochette (Ecology)	

Data Discussed to Help Determine Sample Depths:

- Draft Gamma and Moisture Plots for C8099 angle push
  Note: The plot shows both Vertical Depth and Pipe Run Depth since this is angle push
- Profile of sample depths (for depth perspective and relationship to Tank)
- Available information from C Farm Direct Push efforts
- Available dry well logging information
- General increase in moisture zones from 110 -175 ft bgs and 190 – 252 ft bgs (pipe run) while gamma results were fairly steady

Table 1: Agreed Upon Sample Depths for Location J (C8099/C8100)

Location Log Hole/Sample Hole	Sample Depth Associated with Pipe Run Depth (ft bgs) [~Vertical Depth in ft bgs]	Reason
J C8099/C8100 (Angle Push by Tank C-104)	Surface and Surface Duplicate	• Per plan requirements
	5.7 - 7.7 [~5 - 7]	• Equivalent to ~5-7 ft bgs (vertical depth), per plan requirements
	15 - 17 [~13 - 15]	• Native material • Noticeably higher gamma and low moisture (probably related to Cs-137) • Equivalent to ~13-15 ft bgs (vertical depth), being collected to meet plan requirements of collecting samples from 10-12 and 14-16 ft bgs (See plan requirements and deviation discussion below)
	54 - 56 [~46 - 48]	• Fine grained material (above Tank base) • Higher moisture and gamma increase
	76 - 78 [~66 - 68]	• H1/H2 transition (just below Tank base) • Higher moisture (impounding area)
	118 - 120 [~100 - 102]	• H2 (<1/4 way under Tank) • Higher moisture (impounding area)

Location Log Hole/Sample Hole	Sample Depth Associated with Pipe Run Depth (ft bgs) [~Vertical Depth in ft bgs]	Reason
	173 - 175 [~142 - 144]	• H2, Apparent slight decrease in grain size - based on gamma (~ 2/5 way under Tank) • Higher moisture (impounding area); Bottom of general increasing moisture area (110-180 ft bgs)
	207 - 209 [~183 - 185]	• H2, Past middle of Tank • General moisture increase
	252 - 254 [~218 - 220]	• H2, Near bottom of boring, far side of Tank • Bottom of general increasing moisture area (190 – 250 ft bgs)

Stratigraphic and/or relationship to Tank info
Moisture and/or gamma per Draft Log

Plan Requirements:
Per RPP-PLAN-38777, Sampling and Analysis Plan for Phase 2 Characterization of Vadose Zone Soil in Waste Management Area C:

"Four samples will be collected in the top 15 ft (one at the surface and one each at 5 ft, 10 ft and 14 ft bgs) at each location and up to four additional samples will be collected at depths >15 ft."

"An average of seven samples per location is planned: three in the top 15 ft (not including a surface sample) and four below 15 ft."

Deviation to Requirements:
It was decided that 3 samples (rather than 4) would be sufficient to represent the top 15 ft bgs. The surface and 5 ft bgs samples will be collected and a third sample from 13-15 ft bgs (vertical depth) will be collected from this location to represent the plan required 10-12 and 14-16 ft bgs samples.

The decision to collect one less sample in the top 15 ft bgs was agreed upon by all attendees as the deeper intervals appear to be of more interest (based on draft gamma and moisture plot). Since the deeper intervals were of more interest, six sample depths were chosen at depths > 15 ft bgs. Thus, a total of nine sample depth intervals will be collected and analyzed for this location.

Robert W Lober DOE Project Manager (print)	DOE Project Manager (signature)	2-25-11 Date
Ecology Project Manager (print)	Jeffory J Lyon Ecology Project Manager (signature)	2-25-11 Date

APPENDIX F

CHAIN OF CUSTODY FORMS AND SAMPLE DOCUMENTS

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Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-001 **SAF TITLE** WMA C Sampling for CMS **REV** 2

PROJECT	WMA C
PROGRAM/PROJECT TYPE	RCRA Closure CMS
OPERABLE UNIT	NONE

REQUESTER	ANASTOS, HL	**CHARGE CODES**	
TASK MANAGER	TEMPLETON, AM		
PROJECT COORDINATOR	SYDNOR, HA		

ESTIMATED START DATE	11/1/2010	**SAMPLE AREA**	200 East
ESTIMATED COMPLETION DATE	1/1/2015	**MATRIX**	SOIL
ESTIMATED NUMBER OF SAMPLES	100		

SAMPLING ORGANIZATIONS

Facility Samplers

LABORATORY/PRICE_CODE/PRIORITY TURNAROUND/REQUIRED TURNAROUND/DATA DELIVERABLE

Primary / 222-S Lab Operations / C03 / 60 Days / 120 Days / Interim Results & Summary
Secondary / TestAmerica St. Louis / C03 / 60 Days / 120 Days / Interim Results & Summary

SAF COMMENT

**GENERAL
The applicable FSAP is RPP-PLAN-40564, Revision 2 and the applicable SAP is RPP-PLAN-38777, Revision 2. (Analytical and Quality Control Information is presented in Tables 5-1 through 5-5 and Table A-1).

**FIELD
When collecting a surface sample, the material will be placed in 2-500 ml glass jars w/teflon lids. Soil particles with diameters greater than 0.25" cannot be used for analysis, therefore, field personnel shall make an effort to remove particles greater than 0.25".
Field personnel will cap liners. When capping is not possible, or the liners cannot be removed from the sampler, field personnel shall put material into a glass jar w/teflon lid.

**LABORATORY
222-S will determine bulk density for each liner, then the material from liners and shoe (500 ml glass jar assigned to generic testing) shalll be composited and analyzed for the composite analyses. 222-S will subsample the composited material and provide it to the secondary laboratory (i.e.,TASL) as directed.

All secondary analytes listed in RPP-PLAN-38777 Tables 4-2 and 4-5 will be reported in the data package and electronically when the value is greater than the detection limit.
Final data package should be a Format VI with QA verification.
222-S will transmit all COCs to IDMS.

SAF REVISION COMMENT

Revision 1 includes: identifying separate HEIS #'s for liners, shoe, and composite; adding percent water to composite analysis; eliminating the following analyses: VOC, ethylene glycol, mono and dibutyl phosphate, PCB congeners, gasoline range organics, diesel range organics and sulfide, having 2-500 ml bottles (instead on 1) collected for surface analysis; and changing PCB analysis for aroclors to 222-S laboratory.
Revision 2 added Tc-99 water extract

COC COMMENT

**LABORATORY
Only samples from intervals within the top 15 ft. will be analyzed for pesticides and PCBs.
After bulk density is determined on liners, the liners and shoe material (500 ml glass jar assigned to generic testing) shall be composited.

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-001 **SAF TITLE** WMA C Sampling for CMS **REV** 2

Field Sampling Requirements

Laboratory: 222-S Lab Operations **Matrix: SOIL**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
Bulk Density - D2937 (TF)	D2937_DENSITY	Liner 160 g	Full QC	Cool~6C	24 Hours
Bulk density - wet					
pH (Soil) - 9045	9045_PH	Liner 3X160 g	Full QC	Cool~6C	24 Hours
ICPMS Tc-99_WE(TF)	RADISOTOPES_ICPMS		Minimum		6 Months
Semi-VOA - 8270 Complete (TF)	8270_SVOA_GCMS		Full QC		14/40 Days
1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, 2,6-bis(1,1-dimethylethyl)-4-methyl phenol, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 2-Nitrophenol, 3+4 Methylphenol (cresol, m+p), 4-Chloro-3-methylphenol, Acenaphthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Cellosolve Solvent, Chrysene, Cyclohexanone, Di-n-butylphthalate, Di-n-octylphthalate, Dibenz[a,h]anthracene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isobutyl alcohol, n-Nitrosodi-n-dipropylamine, n-Nitrosomorpholine, Naphthalene, Nitrobenzene, Pyrene, Pyridine, Total cresols, Tributyl phosphate					
6010_Metals_ICP	6010_METALS_ICP		Full QC		6 Months
Aluminum, Barium, Beryllium, Bismuth, Boron, Calcium, Cerium, Chromium, Cobalt, Copper, Europium, Iron, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Nickel, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Silicon, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thorium, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium					
6020_METALS_ICPMS (TF)	6020_METALS_ICPMS		Full QC		6 Months
Antimony, Arsenic, Cadmium, Lead, Selenium, Silver, Thallium					
Mercury - 7471 - (CV) (TF)	7471_HG_CVAA		Full QC		28 Days
IC Anions - 9056	9056_ANIONS_IC		Full QC		28 Days/48 Hours
300.7_AMMONIUM (TF)	300.7_CATIONS_IC		Full QC		7 Days
Total Cyanide - 9014 (TF)	9014_CYANIDE		Full QC		14 Days
GAMMA ENERGY ANALYSIS (TF)	GAMMA_GS		Full QC		6 Months
Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234					
Americium-241 (TF)	AMCMISO_EIE_PLT_AEA		Full QC		6 Months
I129_SEP_GEA (TF)	I129_SEP_GEA		Full QC		6 Months
C-14	C14_LSC		Full QC		6 Months
CURIUM	AMCMISO_EIE_PLT_AEA		Full QC		6 Months
Curium-242, Curium-243/244					
H3 - TRITIUM	TRITIUM_DIST_LSC		Full QC		8 Months
Isotopic Plutonium	PUISO_PLATE_AEA		Full QC		6 Months
Plutonium-238, Plutonium-239/240					
Nickel-63 (TF)	NI63_LSC		Full QC		6 Months
Selenium-79 (TF)	SE79_SEP_IE_LSC		Full QC		6 Months

DATE OF PRINT 05/05/2011 SAF STATUS Revision Issued STATUS DATE 4/12/2011 9:00:00 A PAGE 2 of 4

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-001 **SAF TITLE** WMA C Sampling for CMS **REV** 2

Field Sampling Requirements

Laboratory: 222-S Lab Operations **Matrix: SOIL**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
Strontium-89,90 – Total Sr	SRTOT_SEP_PRECIP_GPC		Full QC		6 Months
Actinides ICPMS (TF)	RADISOTOPES_ICPMS		Full QC		6 Months
Neptunium-237, Thorium-230, Thorium-232, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238					
RADISO_ICPMS (TF)	RADISOTOPES_ICPMS		Full QC		6 Months
Technetium-99, Tin-126					
Conductivity - 9050_WE	9050_CONDUCT		Full QC		28 Days
Percent Solids (TF)	%SOLIDS		Full QC		None
Percent Water (TF)	D2216_%MOIS		Full QC		None
PCBs - 8082	8082_PCB_GC		Full QC		None
Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260					
Generic Testing	SPECIAL_STUDIES	Gs 500 mL	Full QC	Cool~6C	24 Hours
Rad Screen	RADSCREEN	G/P 60 mL	Full QC	None	6 Months

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-001 **SAF TITLE** WMA C Sampling for CMS **REV** 2

Field Sampling Requirements

Laboratory: **TestAmerica St. Louis** **Matrix: SOIL**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
Pesticides - 8081 (TF)	8081_PEST_GC	Liner 500 mL	Full QC	Cool~6C	14/40 Days
4,4'-DDD (Dichlorodiphenyldichloroethane), 4,4'-DDE (Dichlorodiphenyldichloroethylene), 4,4'-DDT (Dichlorodiphenyltrichloroethane), Aldrin, Chlordane, Dieldrin, Endrin, Gamma-BHC (Lindane), Heptachlor, Heptachlor epoxide, Hexachlorobenzene					

Key to Container Types

G = Glass
Gs = Glass w/ septum cap
Gs* = Glass w/ septum cap- no head space in container
P = Plastic (Polyethylene)
aG = Amber Glass
aGs = Amber Glass w/ septum cap
aGs* = Amber Glass w/ septum cap- no head space in container
aG/T = Amber Glass w/ Teflon Lined Lid

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-003 **SAF TITLE** WMA C Sampling for CMS - QC **REV** 1

PROJECT	WMA C		
PROGRAM/PROJECT TYPE	RCRA Closure CMS		
OPERABLE UNIT	NONE		
REQUESTER	ANASTOS, HL	**CHARGE CODES**	
TASK MANAGER	TEMPLETON, AM		
PROJECT COORDINATOR	SYDNOR, HA		
ESTIMATED START DATE	11/1/2010	**SAMPLE AREA**	200 East
ESTIMATED COMPLETION DATE	1/1/2015	**MATRIX**	WATER
ESTIMATED NUMBER OF SAMPLES	30		
SAMPLING ORGANIZATIONS			

LABORATORY/PRICE_CODE/PRIORITY TURNAROUND/REQUIRED TURNAROUND/DATA DELIVERABLE

Primary / 222-S Lab Operations / C03 / 60 Days / 120 Days / Interim Results & Summary
Secondary / TestAmerica St. Louis / C03 / 60 Days / 120 Days / Interim Results & Summary

SAF COMMENT

**GENERAL
The applicable FSAP is RPP-PLAN-40564, Revision 2 and the applicable SAP is RPP-PLAN-38777, Revision 2. (Analytical and Quality Control information is presented in Tables 5-1 through 5-5 and Table A-1).

**FIELD
All samples will be delivered to 222-S, and 222-S will transmit necessary bottles to the secondary laboratory (i.e., TASL)

** LABORATORY
All secondary analytes listed in RPP-PLAN-38777 Tables 4-2 and 4-5 will be reported in the data package and electronically when the value is greater than the detection limit.

The final data package should be in Format VI with QA verification.

222-S will transmit all COCs to IDMS.

SAF REVISION COMMENT

Revision 1 includes: changing PCB analysis for aroclors to 222-S laboratory, eliminating the extra sample collection for PCB aroclor analysis and eliminating the following analyses: VOC, ethylene glycol, mono and dibutyl phosphate, PCB congeners, gasoline range organics, diesel range organics and sulfide.

COC COMMENT

All samples will be delivered to 222-S, and 222-S will transmit necessary bottles to the secondary laboratory (i.e., TASL)

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-003 **SAF TITLE** WMA C Sampling for CMS - QC **REV** 1

Field Sampling Requirements

Laboratory: 222-S Lab Operations **Matrix: WATER**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
pH (Water) - 9040 (TF)	9040_PH	G/P 500 mL	Full QC	Cool~6C	24 Hours
IC Anions - 9056	9056_ANIONS_IC		Full QC		28 Days/48 Hours
Semi-VOA - 8270 Complete (TF)	8270_SVOA_GCMS	aG 1000 mL	Full QC	Cool~6C	7/40 Days
1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, 2,6-bis(1,1-dimethylethyl)-4-methyl phenol, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 2-Nitrophenol, 3+4 Methylphenol (cresol, m+p), 4-Chloro-3-methylphenol, Acenaphthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Cellosolve Solvent, Chrysene, Cyclohexanone, Di-n-butylphthalate, Di-n-octylphthalate, Dibenz[a,h]anthracene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isobutyl alcohol, n-Nitrosodi-n-dipropylamine, n-Nitrosomorpholine, Naphthalene, Nitrobenzene, Pentachlorophenol, Pyrene, Pyridine, Total cresols, Tributyl phosphate					
PCBs - 8082	8082_PCB_GC		Full QC		None
Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260					
Mercury - 7470 - (CV) (TF)	7470_HG_CVAA	G/P 500 mL	Full QC	HNO3 to pH <2	28 Days
6010_Metals_ICP	6010_METALS_ICP		Full QC		6 Months
Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Cerium, Chromium, Copper, Europium, Iron, Lanthanum, Lead, Lithium, Magnesium, Manganese, Molybdenum, Neodymium, Niobium, Palladium, Phosphorus, Potassium, Praseodymium, Rhodium, Rubidium, Ruthenium, Samarium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Tantalum, Tellurium, Thallium, Thorium, Tin, Titanium, Tungsten, Yttrium, Zinc, Zirconium					
RADISO_ICPMS (TF)	RADISOTOPES_ICPMS		Full QC		6 Months
300.7_AMMONIUM (TF)	300.7_CATIONS_IC	G/P 250 mL	Full QC	H2SO4 to pH <2/Cool~6C	7 Days
Total Cyanide - 9014 (TF)	9014_CYANIDE	G/P 250 mL	Full QC	NaOH to pH >=12/Cool~6C	14 Days
GAMMA ENERGY ANALYSIS (TF)	GAMMA_GS	G/P 2X1000 mL	Full QC	HNO3 to pH <2	6 Months
Americium-241 (TF)	AMCMISO_EIE_PLT_AEA		Full QC		6 Months
CURIUM	AMCMISO_EIE_PLT_AEA		Full QC		6 Months
Curium-242, Curium-243/244					
Nickel-63 (TF)	NI63_LSC		Full QC		6 Months
Selenium-79 (TF)	SE79_SEP_IE_LSC		Full QC		6 Months
Strontium-89,90 -- Total Sr	SRTOT_SEP_PRECIP_GPC		Full QC		6 Months
Isotopic Plutonium	PUISO_PLATE_AEA		Full QC		6 Months
Plutonium-238, Plutonium-239/240					
C-14	C14_LSC	G/P 1000 mL	Full QC	None	6 Months
H3 - TRITIUM	TRITIUM_DIST_LSC		Full QC		6 Months

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-003 **SAF TITLE** WMA C Sampling for CMS - QC **REV** 1

Field Sampling Requirements

Laboratory: 222-S Lab Operations **Matrix: WATER**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
I129_SEP_GEA (TF)	I129_SEP_GEA		Full QC		6 Months

Washington River Protection Solutions
SAMPLING AUTHORIZATION FORM

SAF NUM V11-003 **SAF TITLE** WMA C Sampling for CMS - QC **REV** 1

Field Sampling Requirements

Laboratory: **TestAmerica St. Louis** **Matrix: WATER**

Parameter / Analysis	Reference Method	Container / Volume	VolReq	Preservation	Holding Times
Pesticides - 8081 (TF)	8081_PEST_GC	aG 2X1 L	Full QC	Cool~6C	14/40 Days
4,4'-DDD (Dichlorodiphenyldichloroethane), 4,4'-DDE (Dichlorodiphenyldichloroethylene), 4,4'-DDT (Dichlorodiphenyltrichloroethane), Aldrin, Chlordane, Dieldrin, Endrin, Gamma-BHC (Lindane), Heptachlor, Heptachlor epoxide, Hexachlorobenzene					

Key to Container Types

G = Glass
Gs = Glass w/ septum cap
Gs* = Glass w/ septum cap- no head space in container
P = Plastic (Polyethylene)
aG = Amber Glass
aGs = Amber Glass w/ septum cap
aGs* = Amber Glass w/ septum cap- no head space in container
aG/T = Amber Glass w/ Teflon Lined Lid

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	● LO-090-101 Rev EE.C ○ LO-090-102 Rev

Date Samples Received: 2.24.11 Group #: 20110264

Number of Samples: 2 sets C-Farm VAdose

Sample Custodian: RILed

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☒ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? YES PM Initials JR Date 2.24.11

If No, comment on communication and resolution: elected for JR review

Other Comments:

A-6008-342 (REV

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-001	PAGE 1 OF 2
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYONOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 Surface	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TEV2-10-000004	ACTUAL SAMPLE DEPTH: surface	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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	2
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (S) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B1L8	SOIL	2-24-11	1026	✓

5111V004098

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Campbell Campbell	DATE/TIME: 2-24-11 0920	RECEIVED BY/STORED IN: RTSteele RTSteele	DATE/TIME: 2-24-11 0920	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	Hiatt, Anna Grp 20110264
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	-1°C Temp
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	RTSteele 5111V004098
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
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 2/19/2011

A-6003-668 (Rev 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-001	PAGE 2 OF 2
COLLECTOR Campbell / Snook	COMPANY CONTACT ANASTOS, NL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 Surface	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	90 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFUZ-10-000004	ACTUAL SAMPLE DEPTH Surface	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		

SPECIAL INSTRUCTIONS

**Only samples from intervals within the top 15 ft. will be analyzed for pesticides,and PCBs.
(1) pH (Soil) - 9045; Semi-VOA - 8270 Complete (TF) {1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, 2,6-bis(1,1-dimethylethyl)-4-methyl phenol, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 2-Nitrophenol, 3+4 Methylphenol (cresol, m+p), 4-Chloro-3-methylphenol, Acenaphthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Cellosolve Solvent, Chrysene, Cyclohexanone, Di-n-butylphthalate, Di-n-octylphthalate, Dibenz[a,h]anthracene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isobutyl alcohol, n-Nitrosodi-n-dipropylamine, n-Nitrosomorpholine, Naphthalene, Nitrobenzene, Pyrene, Pyridine, Total cresols, Tributyl phosphate); 6010_Metals_ICP; 6020_METALS_ICPMS (TF) {Antimony, Arsenic, Cadmium, Selenium, Silver, Thallium}; Mercury - 7471 - (CV) (TF); IC Anions - 9056; 300.7_AMMONIUM (TF); Sulfide - 9215 Total Cyanide - 9014 (TF); GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; GAMMA ENERGY ANALYSIS (TF); Americium-241 (TF); I129_SEP_GEA (TF); C-14; CURIUM {Curium-242, Curium-243/244}; H3 - TRITIUM; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 -- Total Sr; Actinides ICPMS (TF) {Neptunium-237, Thorium-230, Thorium-232, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238}; RADISO_ICPMS (TF) {Technetium-99, Tin-126}; Conductivity - 9050_WE; Percent Solids (TF); Percent Water (TF); PCBs - 8082 {Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260};

CAT 2/16/11

PRINTED ON 2/15/2011 A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-003	PAGE 1 OF 2
COLLECTOR: Campbell / Shook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SHOWOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8100 Surface Dup	PROJECT DESIGNATION: WMA C Sampling for CHS		SAF NO.: V11-001	AIR QUALITY: ☐	
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-00004	ACTUAL SAMPLE DEPTH: Surface	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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	2
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B1L7	SOIL	2-24-11	0626	J

S11V004115

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Campbell Cpl	DATE/TIME: 2-24-11 0920	RECEIVED BY/STORED IN: RTSteele	DATE/TIME: 2-24-11 0920	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS Scott Shook Grp # 20110264 Temp ~1°C S11V004115 RTSteele
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
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 2/13/2011 A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-003	PAGE 2 OF 2
COLLECTOR Campbell / Snook	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 Surface Dup	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFV2-10-000004	ACTUAL SAMPLE DEPTH Surface	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		

SPECIAL INSTRUCTIONS

**Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
(1) pH (Soil) - 9045; Semi-VOA - 8270 Complete (TF) {1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, 2,6-bis(1,1-dimethylethyl)-4-methyl phenol, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 2-Nitrophenol, 3+4 Methylphenol (cresol, m+p), 4-Chloro-3-methylphenol, Acenaphthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Cellosolve Solvent, Chrysene, Cyclohexanone, Di-n-butylphthalate, Di-n-octylphthalate, Dibenz[a,h]anthracene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isobutyl alcohol, n-Nitrosodi-n-dipropylamine, n-Nitrosomorpholine, Naphthalene, Nitrobenzene, Pyrene, Pyridine, Total cresols, Tributyl phosphate}; 6010_Metals_ICP; 6020_METALS_ICPMS (TF) {Antimony, Arsenic, Cadmium, Selenium, Silver, Thallium}; Mercury - 7471 - (CV) (TF); IC Anions - 9056; 300.7_AMMONIUM (TF); Sulfide LAT 7/10/11 9215 (TF); Total Cyanide - 9014 (TF); GAMMA ENERGY ANALYSIS (TF) {Antimony-125, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Thorium-228, Thorium-234}; GAMMA ENERGY ANALYSIS (TF); Americium-241 (TF); 1129_SEP_GEA (TF); C-14; CURIUM {Curium-242, Curium-243/244}; H3 - TRITIUM; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 – Total Sr; Actinides ICPMS (TF) {Neptunium-237, Thorium-230, Thorium-232, Uranium-233, Uranium-234, Uranium-235, Uranium-236, Uranium-238}; RADISO_ICPMS (TF) {Technetium-99, Tin-126}; Conductivity - 9050_WE; Percent Solids (TF); Percent Water (TF); PCBs - 8082 {Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260};

PRINTED ON 2/15/2011 A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev 66.0 ○ LO-090-102 Rev

Date Samples Received: 2-25-11 Group #: 20110264

Number of Samples: 1 set C-FARM VADOSE C8100 I0001

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
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials DPN Date 3-2-11

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 1)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-005	PAGE 1 OF 1
COLLECTOR: Campbell	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8100 I001	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: ☐	
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	ACTUAL SAMPLE DEPTH: 5.7 - 7.7	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE:

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

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B1M0	SOIL	2-25-11	1155	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell Campbell	DATE/TIME: 2-25-11 1240	RECEIVED BY/STORED IN: RETSTEELG RETSTEELG	DATE/TIME: 2-25-11 1240
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

Tand 0°C RETSTEELG 20110264 S11V004135 Shoe

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

PRINTED ON 2/18/2011

A 6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-006	PAGE 1 OF 1
COLLECTOR: Campbell	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: CB100 I001	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: [ ]	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	ACTUAL SAMPLE DEPTH: 5.7 - 7.7	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 5400.5 (1990/1993)

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	
B2BX79	SOIL	2-25-11	1155	~~1455~~ BC 2-25-11
B2BX80	SOIL	2-25-11	1155	~~1456~~ BC 2-25-11
B2BX81	SOIL	~~2-25-11~~ BC 2-25-11	~~1155~~	~~1455~~ BC 2-25-11

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES: RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM: Gall Campbell	2-25-11 1240	RECEIVED BY/STORED IN: Richard Rickade	2-25-11 1240
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

GRA 20110264

0°C Temp

511V0041-32 A

511004133 B

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

PRINTED ON 2/18/2011

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	◉ LO-090-101 Rev GG-C ○ LO-090-102 Rev

Date Samples Received: 3-1-11 Group #: 20110264

Number of Samples: 1 set VADOSE C FARM C8100 IDOR 1547

Sample Custodian: RHTaylor

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete			✓	☐ In Project File
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	10°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition				If No, provide comments on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials DPR Date 3-1-11

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 1

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-007	PAGE 1 OF 1
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2636	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 1002	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: | |	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: 15-17	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=Drums, Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SF=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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-4C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Gs
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2BX89	SOIL	3-1-11	1335	✓

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Campbell C-pbell	3-1-11 1420	CTSteele	3-1-11 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

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS: Grant Sweet 3-1-11

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited. The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

-12 [illegible] Temp blank

GAH 20110264

511V004156

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

PRINTED ON 3/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-008	PAGE 1 OF 1
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: CB100 2002	PROJECT DESIGNATION: WMA C Sampling for CHS		SAF NO.: V11-001	AIR QUALITY: ☐	
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	ACTUAL SAMPLE DEPTH: 15-17	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 5400.5 (1990/1993)

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	
B2B1M1	SOIL	3-1-11	1335	✓
B2B1M2	SOIL	~~3-1-11~~	~~1335~~	✓
B2B1M3	SOIL	~~3-1-11~~	~~1335~~	✓

BC 3-1-11

BC 3-1-11

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME
RELINQUISHED BY/REMOVED FROM: Chuck Campbell	3-1-11 1420	RECEIVED BY/STORED IN: Richard Stickel	3.1.11 1420
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: Scott Snook 3-1-11

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

-1°C Stickel Temp Blank

604 20110264

511V004152 A

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

PRINTED ON 2/15/2011

A-6003-615 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	◉ LO-090-101 Rev 66.0 ○ LO-090-102 Rev

Date Samples Received: 3.2.11 Group #: 20110264

Number of Samples: 1 set C-Farm VAdose L8100 I003

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
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials [illegible] Date 3/2/11

If No, comment on communication and resolution:

Other Comments:

A-8005-342 (REV 1

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-009	PAGE 1 OF 1
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2635	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 1003	PROJECT DESIGNATION: WMA C Sampling for CMS		SAP NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: 17-19	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool-4C
HOLDING TIME	14 Hours
TYPE OF CONTAINER	Gs
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2BX90	SOIL	3-2-11	0855	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell Campbell 3-2-11	DATE/TIME: 0930	RECEIVED BY/STORED IN: RHSlocle RHSlocle 3-2-11	DATE/TIME: 0930
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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
**LABORATORY Scott Snook 3-2-11
Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
After bulk density on liners is performed, the liners shall be composited.
The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

0°C
Temp Blank
RHSlocle

GOPA 20110264
511V004177902

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

PRINTED ON 3/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-010	PAGE 1 OF 1
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, ML	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C05	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C8100 1003	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: | '	
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	ACTUAL SAMPLE DEPTH: 17 - 19	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 5400.5 (1990/1993)	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	
R2R1M4	SOIL	3-2-11	0855	✓
~~R2R1M5~~	~~SOIL~~ BC 3-2-11			
~~R2R1M6~~	~~SOIL~~ BC 3-2-11			

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Campbell Campbell	DATE/TIME: 3-2-11 0930	RECEIVED BY/STORED IN: RJSteele RJSteele	DATE/TIME: 3-2-11 0930	**LABORATORY Scott Snook 3-2-11 Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs. After bulk density on liners is performed, the liners shall be composited. (1) Bulk Density - D2937 (TF) {Bulk density - wet};
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	-0°C TEMP blank GRH 20110264
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	S11V004174 Liner A
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 2/15/2011 A-6083-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev 46.0 ○ LO-090-102 Rev _____

Date Samples Received: 3.3.11. Group #: 20110264

Number of Samples: 1 set C FAEM VADOSE (C8100 I004)

Sample Custodian: _____

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☑ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials DAR Date 3-3-11

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-011	PAGE 1 OF 1
COLLECTOR: Campbell / Villarreal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 8004	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	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*	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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2BXR4	SOIL	3/3/10	1035	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell Campbell	DATE/TIME: 3-3-11 1140	RECEIVED BY/STORED IN: R. Estee	DATE/TIME: 3-3-11 1140
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

temp blank 0°C

CAPU 20110264

Sam# S11V004199

shoe

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

PRINTED ON 3/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-812	PAGE 1 OF 1
COLLECTOR: Campbell / Villarreal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8188 B04	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	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*	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 5400.5 (1990/1993)	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	
B2B1M7	SOIL	3-3-11	1035	✓
~~B2B1M8~~	~~SOIL~~ 3-3-11 BC			
~~B2B1M9~~	~~SOIL~~ 3-3-11 BC			

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Cpl Campbell	DATE/TIME: 3-3-11 1140	RECEIVED BY/STORED IN: RJSteele RJSteele	DATE/TIME: 3.3.11 1140
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

Temp Blank 0°C Ice Packs

20110264

Sample S11V004196 Liner 7

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

PRINTED ON 2/15/2011

A-6083-618 (REV 1)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	○ LO-090-101 Rev GE.0 ○ LO-090-102 Rev

Date Samples Received: 3.7.11 Group #: 20110264

Number of Samples: 1 set C-FARM VADOSE (C9100 I 005)

Sample Custodian: RT Steele

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☑ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Yes PM Initials GPR Date 3-7-11

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 1

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-013	PAGE 1 OF 1
COLLECTOR: Campbell / Villarreal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8108 X085	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	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*	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 5400.5 (1990/1993)	PRESERVATION	Cool-4C
		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	
B2R436	SOIL	3-7-11	0925	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Phil Campbell	DATE/TIME: 3-7-11 1020	RECEIVED BY/STORED IN: Richard Ritchie	DATE/TIME: 3-7-11 1020
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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: 3-7-11

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

0°C Temp blank Rec'd

GEPE 20110264

Sam # S11V004220 Snoe

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-014	PAGE 1 OF 1
COLLECTOR: Campbell/Villarreal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 1005	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFU2-10-000004	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*	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 5400.5 (1990/1993)	PRESERVATION	Cool-6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	100g
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B28 1N0	SOIL	3-7-11	0925	✓
B28 1N1	SOIL	3-7-11	0925	✓
~~B28 1N2~~	~~SOIL~~ BC 3-7-11			

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Cahill C-pacM	3-7-11 1020	RACHACK RACHACK	3.7.11 1020
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY 3-7-11

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

Temp blank

GAP # 20110264

Sam # 511V004217 A

511V004218 B

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

PRINTED ON 2/18/2011

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev 6.0 ○ LO-090-102 Rev _____

Date Samples Received: 3.10.11 Group #: 20110264

Number of Samples: 1 set CFAAM vadose C8100 2006

Sample Custodian: _____

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☒ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Y(N) PM Initials RK Date 3.10.11

If No, comment on communication and resolution: per JS.

Other Comments:

A-6005-342 (REV 1

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-015	PAGE 1 OF 1
COLLECTOR: Ekstrom / Campbell	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 I006	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-003	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: 76 to 78 ft	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

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

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B436	SOIL	3/10/11	1200	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: BR Ekstrom BR Ekstrom	DATE/TIME: 3/10/11 1240	RECEIVED BY/STORED IN: RL Steele RL Steele	DATE/TIME: 3-10-11 1240
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY BC Schell 3-10-11

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited. The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

Temp blank 0°C RLHd

GRPH 20110264

Smpl ~~S11W00 4238~~ RLHd ~~S11W00 4239~~ RLHd ~~S11W00 4240~~ RLHd S11W00 4241 Shoe

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-016	PAGE 1 OF 1
COLLECTOR: Ekstrom / Campbell	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 I006	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-003	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: 76 to 78 ft	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 5400.5 (1990/1993)

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	
B2B1N3	SOIL	3/10/11	1200	✓
B2B1N4	SOIL	3/10/11	1200	✓
B2B1N5	SOIL	3/10/11	1200	✓

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES: RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM: BEkstrom BEkstrom	3/10/11 1240	RHSteele RHSteele	3.10.11 1240
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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
**LABORATORY B Campbell 3-10-11
Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
After bulk density on liners is performed, the liners shall be composited.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Temp blank 0°C
Chilled

GRP# 20110264
S11V004238 A
S11V004239 B
S11V004240 C

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev 6E.0 ○ LO-090-102 Rev

Date Samples Received: 3-21-11 Group #: 20110264

Number of Samples: 1 set C-FARMHOUSE C-F100 I007

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
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	10 C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials DPR Date 3-21-11

If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 1)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-017	PAGE 1 OF 1
COLLECTOR: Campbell / Snook	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C8100 I007	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000001	ACTUAL SAMPLE DEPTH: 118-120	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 5400.5 (1990/1993)	PRESERVATION	Cool~6C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B437	SOIL	3-21-11	0935	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell	DATE/TIME: 3-21-11 1015	RECEIVED BY/STORED IN: RTSteele	DATE/TIME: 3-21-11 1015
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY Scott Snook 3-21-11

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

Temp blank 0°C checked

GRP # 20110264

Sam # S11V004262 Shoe

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

PRINTED ON 3/18/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-018	PAGE 1 OF 1
COLLECTOR Campbell / Snook	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 I007	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFV2-10-000004	ACTUAL SAMPLE DEPTH 158-120	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 5400.5 (1990/1993)	PRESERVATION	Cool=5C
		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	
B2C1K8	SOIL	3-21-11	0935	✓
B2C1K9	SOIL	3-21-11	0935	✓
B2C1L0	SOIL	3-21-11	0935	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Chuck Campbell	3-21-11 1015	RJSteele RJSteele	3-21-11 1015
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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
Scott Snook 3-21-11
**LABORATORY
Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
After bulk density on liners is performed, the liners shall be composited.
(1) Bulk Density - D2937 (TF) {Bulk density - wet};

Temp blank 0°C filled

GAP # 20110264
SAM # S11V00 4259 A
4260 B
4261 C
~~4262 Short~~
no again

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev Eb0 ○ LO-090-102 Rev

Date Samples Received: 3.14.11 Group #: 20110261
Number of Samples: 1 set equipment blank C-Farm ~~B/T Blank~~ 20110263
Sample Custodian:

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☑ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? ~~yes~~ yes PM Initials DPR Date 3-15-11
APR 3-15-11
If No, comment on communication and resolution:

Other Comments:

A-6005-342 (REV 1

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-003-001	PAGE 1 OF 1
COLLECTOR: Campbell / Villareal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND: 60 Days / 120 Days
SAMPLING LOCATION: C B100 Equipment Blank 1	PROJECT DESIGNATION: WMA C Sampling for CMS - QC		SAF NO.: V11-003	AIR QUALITY: ☐	
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: Equipment	COA: N/A	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO: Los Angeles FL 33021	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	Cool-4C
A=Air, OL=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 5400.5 (1990/1993)	HOLDING TIME	14/40 Days
		TYPE OF CONTAINER	mS
		NO. OF CONTAINER(S)	2
		VOLUME	1L
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSES	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B1N8	WATER	3-14-11	0905	✓

Placed in Fridge Door 13 RHTal 3.14.11

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell C_Campbell	DATE/TIME: 3-14-11 1010	RECEIVED BY/STORED IN: RTSteele RTSteele	DATE/TIME: 3.14.11 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

All samples will be delivered to 222-S, and 222-S will transmit necessary bottles to the secondary laboratory (i.e., TASL)
(1) Pesticides - 8081 (TF) {4,4'-DDD (Dichlorodiphenyldichloroethane), 4,4'-DDE (Dichlorodiphenyldichloroethylene), 4,4'-DDT (Dichlorodiphenyltrichloroethane), Aldrin, Chlordane, Dieldrin, Endrin, Gamma-BHC (Lindane), Heptachlor, Heptachlor epoxide, Hexachlorobenzene);

3-14-11

20110261 Grp
SHV004090-4097

2L Trip blank added

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

PRINTED ON 2/16/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-003-001	PAGE 1 OF 2
COLLECTOR: Campbell / Villarreal	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: C 8100 Equipment Blank 1	PROJECT DESIGNATION: WMA C Sampling for CMS - QC		SAF NO.: V11-003	AIR QUALITY: ☐	60 Days / 120 Days
ICE CHEST NO.: 003	FIELD LOGBOOK NO.: TFV2-10-000004	ACTUAL SAMPLE DEPTH: Equipment	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C	Cool~6C	HNO3 to pH <2	H2SO4 to pH <2/Cool~6C	NaOH to pH >=12/Cool~6C	HNO3 to pH <2	None
HOLDING TIME	24 Hours	7/40 Days	28 Days	7 Days	14 Days	6 Months	6 Months
TYPE OF CONTAINER	G/P	BG	G/P	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1	1	2	1
VOLUME	500mL	1000mL	500mL	250mL	250mL	1000mL	1000mL
SAMPLE ANALYSIS	pH (Water) - 9040 (TF); IC Anions - 9056;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	300.7_AMMONIA (TF);	Total Cyanide - 9014 (TF);	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	C-14; H3 - 1BETAIN; U3N_S3_C8A (TF);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B2D1N6	WATER	3/14/11	0905	✓	✓	✓	✓	✓	✓	✓

S11V004090 S11V004097

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: Campbell C Campbell 3-14-11	DATE/TIME: 1010	RECEIVED BY/STORED IN: Rfletcher RFletcher 3-14-11	DATE/TIME: 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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] 3-14-11

Test blank O.K. RFletcher

20110261 Grp
~~S11V004090-4097~~ mo 3/14/11
S11V004090 - 4097

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

PRINTED ON 2/16/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-003-801	PAGE 2 OF 2
COLLECTOR Campbell / Villarreal	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, MA	PRICE CODE C03 AIR QUALITY ☐	DATA TURNAROUND 60 Days / 120 Days
SAMPLING LOCATION C 8100 Equipment Blank 1	PROJECT DESIGNATION WMA C Sampling for CMS - QC		SAF NO. V11-003		
ICE CHEST NO. 003	FIELD LOGBOOK NO. TEV2-10-00004	ACTUAL SAMPLE DEPTH Equipment	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		

SPECIAL INSTRUCTIONS

All samples will be delivered to 222-S, and 222-S will transmit necessary bottles to the secondary laboratory (i.e., TASL).
(1) Semi-VOA - 8270 Complete (TF) {1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, 2,6-bis(1,1-dimethylethyl)-4-methyl phenol, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 2-Nitrophenol, 3+4 Methylphenol (cresol, m+p), 4-Chloro-3-methylphenol, Acenaphthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Cellosolve Solvent, Chrysene, Cyclohexanone, Di-n-butylphthalate, Di-n-octylphthalate, Dibenz[a,h]anthracene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isobutyl alcohol, n-Nitrosodi-n-dipropylamine, n-Nitrosomorpholine, Naphthalene, Nitrobenzene, Pentachlorophenol, Pyrene, Pyridine, Total cresols, Tributyl phosphate}; PCBs - 8082 {Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260};
(2) Mercury - 7470 - (CV) (TF); 6010_Metals_ICP; 6020_METALS_ICPMS (TF) {Antimony, Arsenic, Cadmium, Selenium, Silver, Thallium}; RADISO_ICPMS (TF);
(3) GAMMA ENERGY ANALYSIS (TF); Americium-241 (TF); CURIUM {Curium-242, Curium-243/244}; Nickel-63 (TF); Selenium-79 (TF); Strontium-89,90 – Total Sr; Isotopic Plutonium {Plutonium-238, Plutonium-239/240};

PRINTED ON 2/16/2011 A-6003-816 (REV

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	● LO-090-101 Rev GG0 ○ LO-090-102 Rev

Date Samples Received: 3-23-11 Group #: 20110264

Number of Samples: 1 set C-FARM VADOSE (C8100) I008

Sample Custodian: RHLeal

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☑ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials RHL Date 3.23.11

If No, comment on communication and resolution: per SGM

Other Comments:

A-6005-342 (REV 1)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-019	PAGE 1 OF 1
COLLECTOR Campbell	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 I008	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFV2-10-000004	ACTUAL SAMPLE DEPTH ~~173 - 175~~ 3-23-11 168.6 - 170.6	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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B438	SOIL	3-23-11	1100	V

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	**LABORATORY Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs. After bulk density on liners is performed, the liners shall be composited. The 500 ml bottle for generic testing will be archived unless the project requests additional analyses. 3-23-11 GRF# 20110264 Sam# S11V004293 snoe Temp blank 0°C Rlstel
B-2 Campbell C-Campbell	3-23-11 1130	RLSteele RLSteele	3-23-11 1130	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
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 2/15/2011

A-6003-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-020	PAGE 1 OF 1
COLLECTOR Campbell	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 I008	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFVZ-10-000004	ACTUAL SAMPLE DEPTH ~~175 - 175~~ 168.6 - 170.6 HC 3-23-11	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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	180g
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2C1L1	SOIL	3-23-11	1100	✓
B2C1L2	SOIL	3-23-11	1100	✓
B2C1L3	SOIL	3-23-11	1100	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Cpbell Campbell	DATE/TIME 3-23-11 1130	RECEIVED BY/STORED IN Rhtech RHSteele	DATE/TIME 3-23-11 1136
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

3-23-11

Trip blank 000

Metals

GAPID 26110264

Sample 511U00 4280 A
4281 B
4282 C

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	⊗ LO-090-101 Rev E.E.0 ○ LO-090-102 Rev

Date Samples Received: 3.24.11 Group #: 20110264

Number of Samples: 1 set C-FARM VADOSE (C-8100) (I009)

Sample Custodian:

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSA/COC provided?	✓			
RSR provided?	✓			
Verify GKI is complete				☑ In Project File
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 on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? YES PM Initials PER SGM Date 3.24.11

If No, comment on communication and resolution: Rt Ctad

Other Comments:

A-6005-342 (REV 1)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-021	PAGE 1 OF 1
COLLECTOR Campbell/Ekstrom	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 J009	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 008	FIELD LOGBOOK NO. TFV2-10-000004	ACTUAL SAMPLE DEPTH 202-204 ft.	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

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

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2C1L4	SOIL	3/24/11	1337	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM B Ekstrom B Ekstrom	DATE/TIME 3/24/11 1440	RECEIVED BY/STORED IN RHTed RHTed	DATE/TIME 3-24-11 1440
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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
**LABORATORY
Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
After bulk density on liners is performed, the liners shall be composited.
The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.
Bobby Campbell 3-24-11
0°C
Temp blank RHTed
GeP# 20110269
Sam# S11V08 4304
shoe

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

PRINTED ON 3/28/2011 A-6009-618 (REV 2)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-022	PAGE 1 OF 1
COLLECTOR: Campbell / Ekstrom	COMPANY CONTACT: ANASTOS, HL	TELEPHONE NO.: 373-2616	PROJECT COORDINATOR: SYDNOR, HA	PRICE CODE: C03	DATA TURNAROUND
SAMPLING LOCATION: CB100 I009	PROJECT DESIGNATION: WMA C Sampling for CMS		SAF NO.: V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO.: TFVS-09-008	FIELD LOGBOOK NO.: TFVZ-10-000004	ACTUAL SAMPLE DEPTH: 202 to 204 ft	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 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool~6C
HOLDING TIME	24 Hours
TYPE OF CONTAINER	Liner
NO. OF CONTAINER(S)	1
VOLUME	150g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2C1L6	SOIL	3/24/11	1337	✓
B2C1L7	SOIL	3/24/11	1337	✓
B2C1L8	SOIL	3/24/11	1337	✓

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES: RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM: RB Ekstrom RB Ekstrom	3/24/11 1440	RHEstes RHEstes 3-24-11	1440
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
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

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

3-24-11

Temp blank 0°C RHEstes

Group 20110264 ~~20110264~~ RHEstes

Samples S11V004301 A, 4302 B, 4303 C

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

A-6003-618 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	☒ LO-090-101 Rev 6.0 ○ LO-090-102 Rev

Date Samples Received: 4.4.11 Group #: 20110264

Number of Samples: 1 set CFrm VADOC (C8100) (I0010)

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
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	6°C			☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments on back
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	✓			
• 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. (Any "No" checked requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials RBB Date 4.4.11

If No, comment on communication and resolution: per SGM

Other Comments:

A-6005-342 (REV 1)

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-023	PAGE 1 OF 1
COLLECTOR Campbell / Snook	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION C8100 I010	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFV2-10-00000 4	ACTUAL SAMPLE DEPTH 22.18 - ~~22.48~~ 22.48	COA #L4-4-11 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 5400.5 (1990/1993)	HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Gs
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Generic Testing

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2C1L5	SOIL	✓	1020	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Colleen Campbell	DATE/TIME 4-4-11 1100	RECEIVED BY/STORED IN Allison Reynolds	DATE/TIME 4-4-11 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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
**LABORATORY Scott Snook 4-4-11
Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.
After bulk density on liners is performed, the liners shall be composited.
The 500 ml bottle for generic testing will be archived unless the project requests additional analyses.

Temp blank
0°C
Meth ATL

GRP# 20110269
~~Sample S11V00~~ ~~4330~~ Meta
4301 Meta
Sample S11V00433 4372 Meta
Sample 4373 Meta

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

✓

Washington River Protection Solutions	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			V11-001-024	PAGE 1 OF 1
COLLECTOR Campbell / Snook	COMPANY CONTACT ANASTOS, HL	TELEPHONE NO. 373-2616	PROJECT COORDINATOR SYDNOR, HA	PRICE CODE C03	DATA TURNAROUND
SAMPLING LOCATION CB100 1010	PROJECT DESIGNATION WMA C Sampling for CMS		SAF NO. V11-001	AIR QUALITY ☐	60 Days / 120 Days
ICE CHEST NO. 003	FIELD LOGBOOK NO. TFV2-10-000004	ACTUAL SAMPLE DEPTH 222.6 - ~~224.8~~ 224.8	COA 4-4-11 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		
Aa=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 5400.5 (1990/1993)	PRESERVATION	Cool-4C
		HOLDING TIME	24 Hours
		TYPE OF CONTAINER	Liner
		NO. OF CONTAINER(S)	1
		VOLUME	150g
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2C1L9	SOIL	4-4-11	1020	✓
B2C1M0	SOIL	4-4-11	1020	✓
B2C1M1	SOIL	4-4-11	1020	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Scott Campbell	DATE/TIME 4-4-11 1100	RECEIVED BY/STORED IN [illegible]	DATE/TIME 4-4-11 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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS Scott Snook 4-4-11

**LABORATORY

Only samples from intervals within the top 15 ft. will be analyzed for pesticides, and PCBs.

After bulk density on liners is performed, the liners shall be composited.

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

Temp blank
QC related
ATL

GRP # 20110264
Sam # S11V004330 Liner A
4331 Liner B
4332 Liner C

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

PRINTED ON 2/15/2011

A-6003-618 (REV 2)

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APPENDIX G

WASHINGTON STATE DEPARTMENT OF ECOLOGY DOCUMENTS

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WASHINGTON STATE DEPARTMENT OF ECOLOGY

Notice of Intent to Construct a
Soil Boring or Soil Sampling or Vapor Sampling Well

This form and required fees **MUST BE RECEIVED** by the Department of Ecology **72 HOURS BEFORE** you construct a well.

Notification Number **SE08643**

Submit one completed form for each job site and required fee (check or money order only) to: Department of Ecology Cashiering Unit, P.O. Box 47611, Olympia, WA 98504-7611

NOTE: Please print. Processing your Notice of Intent may be delayed if all fields are not filled in completely.

1. Property Owner: U.S. Department of Energy		Phone Number:	
Mailing Address: 825 Jadwin	City: Richland	State: WA	Zip Code: 99354
2. Agent (if different from above): Energy Solutions Inc.		Phone Number: 509-308-0136	
Mailing Address: 2521 Stevens	City: Richland	State: WA	Zip Code: 99354

3. Well Location

Tax Parcel Number, ¼, Section, Township, and Range are Required. Latitude and longitude (if available).

County Name: Benton					
Well Site Street Address	City		State: WA	Zip Code	
Tax parcel number	¼ -¼ (within 40 acres): SE	¼ (within 40 acres): NE	Section: 34	Township: 2	Range: 26E
Latitude Degrees	Latitude Time: min sec		Horizontal Collection Method		
Longitude Degrees	Longitude Time: min sec				

4. Well Construction Type: Geotech Soil Boring — Project Name: C Tank Farm

5. Approximate start date (mm/dd/year): 11/25/2010

6. Contractor L & I Registration Number: DURATFS990K5

7. Well Drilling Company Name: ENERGY SOLUTIONS INC	Phone Number: 509-375-9800
8. Well Driller Name: DAVID SKOGLIE	Driller License Number: 1580

9. **Send the entire form.**
Please copy the notification number (located in the upper and lower right corners) and keep in a safe place. Use this reference number when communicating with the Department of Ecology.

Total Number of wells to be constructed: 6

This notification number must be provided to your driller: **SE08643**

No fees are associated with this type of well construction.

Print Form

Your Notice of Intent has been processed as of 11/19/2010 This message being sent at (11/19/2010 11:43:10 AM)

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Notice of Intent to
Decommission a Well

Notification Number

AE11450

This form and required fees **MUST BE RECEIVED** by the Department of Ecology **72 HOURS BEFORE** you construct a well.

Submit one completed form for each job site and required fee (check or money order only) to:
Department of Ecology Cashiering Unit, P.O. Box 47611, Olympia, WA 98504-7611

NOTE: Please print. Processing your Notice of Intent may be delayed if all fields are not filled in completely.

1. Property Owner: U.S. Department of Energy | Phone Number:
   Mailing Address: 825 Jadwin | City: Richland | State: WA | Zip Code: 99354
2. Agent (if different from above): Energy Solutions Inc. | Phone Number: 509-308-0136
   Mailing Address: 2521 Stevens | City: Richland | State: WA | Zip Code: 99354
3. Well Location

Tax Parcel Number, ¼, Section, Township, and Range are Required. Latitude and longitude (if available).

County Name: Benton

Well Site Street Address	City	State	Zip Code
		WA	

Tax parcel number	¼ -¼ (within 40 acres)	¼ (within 40 acres)	Section	Township	Range
	SE	NE	34	2	26E

Latitude Degrees	Latitude Time min sec	Horizontal Collection Method
Longitude Degrees	Longitude Time min sec	

4. Notice of Intent Number of well being decomissioned: NA | Unique Well Tag Numer of well being decomissioned (if applicable)
5. Well Type to Decommission: Geotech Soil Boring/Sampling Well - No Fee | How Many? 6
6. Approximate construction start date: 11/25/2010 | Project Name: C tank Farm
7. Contractor L & I Registration Number: DURATFS990K5
8. Well Drilling Company Name: ENERGY SOLUTIONS INC | Phone Number: 509-375-9800
9. Well Driller Name: DAVID SKOGLIE | Driller License Number: 1580
10. **Send the entire form.**

Please copy the notification number (located in the upper and lower right corners) and keep in a safe place. Use this reference number when communicating with the Department of Ecology.

Water Well :	$50.00
Soil Sampling, Dewatering, Environmental investigation wells:	No Fee
All other wells:	$20.00 each
Amount Enclosed $	$0

This notification number must be provided to your driller:

AE11450

Print Form

Your Notice of Intent has been processed as of 11/19/2010 This message being sent at (11/19/2010 11:42:58 AM)

ENERGYSOLUTIONS

April 18, 2011 FS-NW-LT-5483

State of Washington
Department of Ecology
Nuclear Waste Program
Hanford Project
3100 Port of Benton Boulevard
Richland, Washington 99354

Subject: Water Well Reports

To Whom It May Concern,

Attached are Water Well Report forms addressing decommissioning operations for two geotechnical soil borings. These Water Well report forms have been completed with information from field operations (reference Notice of Intent Start Card SE08643 and Abandonment Start Card AE11450). This geotechnical boring is located on the Hanford Site, 200 East Area, C Tank Farm.

These geotechnical soil boring are designated as C8099 (exploratory borings) and C8100 (sample borings).

The fractional section system topographical location for these geotechnical borings is SE ¼ NE ¼, Section 2, Township 12N, Range 26EWM

If you have any questions, please contact me at 375-9587.

Very truly yours,

Martin G. Gardner, Manager
Field Characterization and
Environmental Services

jmr

Attachments

CHPRC	- S. H. Worley	R3-60
WRPS	- H. A. Sydnor	E6-31
Energy*Solutions*	- K. D. Reynolds	G2-02
	D. E. Skoglie	G2-02
	R. Z. Steffler	G2-02
	MGG File/LB	

2345 Stevens Drive, Suite 240 • Richland, Washington 99354 • 509.371.8006
Fax: 509.375.9986 / 509.371.1906 / 509.375.9500 • www.energysolutions.com

ENERGYSOLUTIONS

FS-NW-LT-5483

ATTACHMENT

Resource Protection Well Reports

Consisting of 3 pages,
including cover sheet

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE11450

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction
☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: SE08643

Consulting Firm Energy Solutions

Unique Ecology Well IDTag No. C8099

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Skoglie, David

Driller/Engineer /Trainee Signature David E. Skoglie

Driller or Trainee License No. 1580

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☐ Resource Protection
☒ Geotech Soil Boring

Property Owner U.S. Department of Energy

Site Address 825 Jadwin Ave.

City Richland County Benton

Location SE1/4-1/4 NE1/4 Sec 02 Twn 12 R 26E

EWM ☒ or WWM ☐

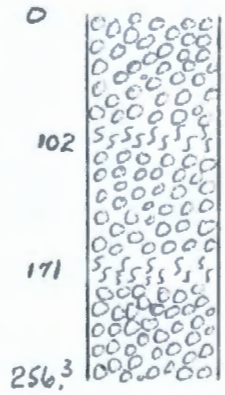
Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____ Long Deg _____ Min _____ Sec _____

Tax Parcel No. N/A

Cased or Uncased Diameter 3.0 inch Static Level N/A

Work/Decommission Start Date 01/12/2011

Work/Decommission Completed Date 04/13/2011

Construction Design	Well Data	Formation Description
The direct push tubing (2.5 inch O.D.) was driven to a depth of 256.3 ft @ an angle of 60 degrees from horizontal. The drive point O.D. is ~3.0 inches diameter. Gamma and Moisture geophysical logging was conducted. A gyro survey instrument was ran at various depths to determine boring deviation. Moisture probes were installed @ 102 and 171 ft. Reference Variance Request for Direct Push Bore-holes dated 3/30/2010.		C Tank Farm, 200 East Area, Hanford Site, Benton County Formation was sand with minor gravel layers (noted during driving).
	Borehole is surveyed and a protective casing is placed with I.D. tag. 0 = bentonite crumbles S = moisture probe interval	

SCALE: 1"= 115 ft PAGE 1 OF 1

ECY 050-12 (Rev. 7/06)

Ecology is an Equal Opportunity Employer

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE11450

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction
☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: SE08643

Consulting Firm Energy Solutions

Unique Ecology Well IDTag No. C8100

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Skoglie, David

Driller/Engineer/Trainee Signature David C. Skoglie

Driller or Trainee License No. 1580

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☐ Resource Protection
☒ Geotech Soil Boring

Property Owner U.S. Department of Energy

Site Address 825 Jadwin Ave.

City Richland County Benton

Location SE 1/4-1/4 NE 1/4 Sec 02 Twn 12 R 26E

EWM ☒ or WWM ☐

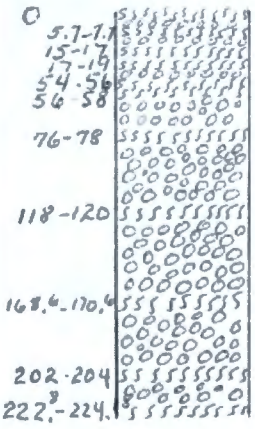
Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____ Long Deg ____ Min ____ Sec ____

Tax Parcel No. N/A

Cased or Uncased Diameter 3.0 inch Static Level N/A

Work/Decommission Start Date 02/25/2011

Work/Decommission Completed Date 04/07/2011

Construction Design	Well Data	Formation Description
The direct push tubing (2.625 inch O.D.) was driven to a depth of 224.8 ft @ an angle of 60 degrees from horizontal. The drive point O.D. is ~3.0 inches diameter. A gyro survey instrument was ran at various depths to determine boring deviation. Samples were obtained @ surface, 5.7 to 7.7, 15 to 17, 17 to 19, 54 to 56, 56 to 58, 76 to 78, 118 to 120, 168.6 to 170.6, 202 to 204 and 222.8 to 224.8 ft. Reference Variance Request for Direct Push Bore-holes dated 3/30/2010.		C Tank Farm, 200 East Area, Hanford Site, Benton County Formation was sand with minor gravel layers (noted during driving).
	Borehole location is surveyed. 0 = bentonite crumbles S = sample intervals	

SCALE: 1"= 90 ft PAGE 1 OF 1

ECY 050-12 (Rev. 7/06)

Ecology is an Equal Opportunity Employer

APPENDIX H

SAFETY DOCUMENTATION

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WRPS JOB HAZARD ANALYSIS CHECKLIST

Prepared By (print/sign/date): Kris Hutchings 11/18/2010 JHA-10-007 Revision 3 02/15/2011 by K. Hutchings	**Work Package/Procedure No.:** WO-10-3889

Work Scope/Description: Per work package #WO-10-3889.

Specific Work Location: Hanford, 200 East Area, C Farm C104

Walk Down Conducted: ☒ YES **If YES, Date Performed:** 11/3/10 11/15/10
☐ NO **If NO, Level 2 Manager Approval:** _____

Specific Hazard Analysis and Safety Work Requirements

Known and/or potential hazards have been evaluated at the task level with applicable tasks, required controls and methods of control noted below.

Approvals:

MOBARDNER / [illegible] 2/16/11 | R3 / [illegible] / 2-16-11 | _____

Supervisor (print/sign/date) | **Industrial Safety (print/sign/date)** | **Other (print/sign/date)**

		Activity/Task Hazard Analysis	Method: *
Crane or other Lifting Equipment Lifting and Rigging Objects	Yes / No ☒ ☐	☒ Normal ☐ Special Lift ☐ Critical Lift ☐ Signalman assigned ☐ Spotter ☒ Lifting Equip Inspection ☐ Area around crane barricaded ☐ Lift <30°F and Engineering Evaluation Completed Task: **Using hoist to raise/lower inner string** • Only trained personnel shall use the hoisting/rigging equipment during casing removal activities.	1, 6
Vehicular Traffic, Heavy Equipment and or Forklift Use	Yes / No ☒ ☐	☐ Traffic Barricades ☐ Cones ☒ Signs ☒ Spotters (2 min) ☐ Lane Closure ☒ Communication with Equipment Operator ☒ Surface Condition ☒ Traffic Vest ☒ Trained Equipment Operator Task: **Setup and Placement of Angle Plate** **Moving pipe and supplies with forklift** **Moving and operating the HHU-XL, HHU backhoes (tractors)** **Driving Casing** • Familiarize operator and spotters with the location (travel paths) and types of overhead hazards prior to operating equipment. • Due to the top heavy design of the HHU, use caution when on sloped surfaces, and avoid side hilling. • Only trained personnel shall operate the HHU/HHU-XL drive units. • Personnel working in close proximity to the hydraulic hammer unit shall be briefed on the moving parts and hazards. • Make contact with the equipment operator before approaching.	1, 6
Overhead Utilities	Yes / No ☐ ☒	☐ De-energization req. ☐ Insulation blankets req. ☐ Wire watch req. ☐ Req. clearance distance ☐ Safe work zone marked Task:	N/A
Falls/Roof Work/ Steep Slope	Yes / No ☒ ☐	☐ Fall Protection Plan ☐ Elevated Work Platform/Aerial Lift (inspected and operators trained) ☒ Provide Cattle Guards Task: **General Site Activities** • Provide cattle guards at the edge of the work area near the slope dropping down into the C104 tank vicinity.	1,6

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

WRPS JOB HAZARD ANALYSIS CHECKLIST			
Ladder or Scaffold Use	Yes / No ☒ ☐	☒ Inspect ladder/scaffold condition ☒ Current ladder/scaffold inspection ☐ Ladder tied off ☒ Proper ladder size ☒ Proper ladder position/support ☒ Safe ladder/scaffold practices will be followed Task: **Making/Breaking casing and inner string** • Use ANSI approved ladders rated for heavy-duty or extra heavy-duty use (Type 1 or 1A).	1, 6
Moving/Falling Objects from height	Yes / No ☒ ☐	☐ Tether small objects ☐ Use rope, canvas bag ☐ Barricade around potential fall area ☐ Barricade tape ☒ Hard Hats ☐ Tie off tools/materials ☐ Warning signs ☐ Cover openings ☐ Rigid railing required Task: **Moving the tractor and equipment to the designated probe location, moving equipment with forklift** **Driving casing** **Pulling casing/sampling activities** • Wear hard hats and protective toed shoes when working around forklifts, the tractors, or elevated objects that could fall.	1, 6
Excavations	Yes / No ☒ ☐	☒ Excavation/Shoring permit ☐ Inspect prior to entry ☐ Competent Person Inspection ☐ Proper sloping/shoring ☐ Access/egress provided ☒ Scans ☐ Barricades ☐ Confined Space Evaluation Task: **C104 Angle Push Project**	1,5,6
Underground Utilities (line locating)	Yes / No ☒ ☐	☐ Review ground scans ☒ Received excavation permit ☐ Insulated hand tools ☐ Maintain clearance distance ☒ Safe work zone marked Task: **Driving Casing**	2,5,6
Fire Hazard, weld, burn, grind, solder	Yes / No ☒ ☐	☒ Extinguishers ☒ Fire Watch ☐ Respiratory Protection ☒ Adjacent area protected ☒ Flammable Material Removed ☒ Hot Work Permit ☒ Fire Blanket ☐ Welding Screen ☐ Fire Marshall Permit # Task: **Equipment Maintenance and Repair--Welding**	1,4,5,6

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

WRPS JOB HAZARD ANALYSIS CHECKLIST			
Noise >85 dBA	Yes / No ☒ ☐	☒ Hearing Protection ☒ Ear Plugs ☒ Ear Muffs ☐ Noise Monitoring ☒ Alternate Emergency Communication System Task: **Moving the tractor and equipment to the designated probe location** **Operating the HHU and HHU-XL tractors, or forklift** **Operation of portable generators** • Equipment operator, helper, spotter, and support personnel shall wear hearing protection, with a minimum NRR of 18. • Stage the generators at the greatest distance feasible from work crew to help reduce time accumulated noise exposure. **Driving Casing** • Post the work area with a "CAUTON" sign warning personnel of noise hazard when equipment is operating. • Wear ear plugs with a minimum NRR of 30 and ear muffs if inside the established boundary. • HHU—Set up a boundary of 50' from the drill head. Where 50' is not feasible, attain a boundary at the greatest distance possible and notify support personnel that they may need additional hearing protection. • HHU-XL—Set up a boundary of 100' from the drill head. Where 100' is not feasible, attain a boundary at the greatest distance possible and notify support personnel that they may need additional hearing protection Due to the use of hearing protection in a high noise environment, personnel may not be able to hear standard emergency notifications and an alternate means of emergency notification must be established.	1,2,6
Hazardous Energy Air/Steam Fluid	Yes / No ☒ ☐	☐ Depressurize ☒ PPE ☐ Whip Check tie-downs ☐ Cool down systems ☒ Lockout/Tagout Task: **Tractor /HHU Equipment Maintenance** • Prior to performing maintenance that removes guards or exposes the worker to hazardous energy, secure the source then lock and tag according to DOE-0336 procedures. • Ensure that workers have current authorized worker training.	1,5,6
Stored Energy	Yes / No ☒ ☐	☒ Lockout/Tagout ☒ Remove Energy ☐ PPE Task: LOTO required during equipment maintenance activities **Tractor /HHU Equipment Maintenance** • Follow safety measures previous mentioned for Hazardous Energy Air/Steam Fluid. • Lower hydraulic components such as outriggers, backhoe, and drill mast to a solid resting surface. • Utilize braces on equipment as needed.	1,5,6

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

WRPS JOB HAZARD ANALYSIS CHECKLIST			
Rotating/Moving Equipment or Pinch Points	Yes / No ☒ ☐	☐ Lockout/Tagout ☒ Machine guards in place ☐ Block parts against motion ☐ PPE ☒ Hand/Body Position ☒ Remove Loose clothing Task: **Driving Casing** **Logging** **Pulling Casing/Sampling Activities** • Wear leather gloves or equivalent work gloves when handling equipment. • Be aware of placement of hands and feet during the work evolution. • Ensure that adequate communication can take place between equipment operator and support personnel, i.e. an understanding of appropriate action hand signals, verbal cues, and visual signals (strobe flashing). • Ensure that wrenches are in good working condition (clean, jaws not worn, etc.). • Only approved equipment may be used to make up and break out push tubing, never use a "cheater" bar.	1,6
Chemical Use/Hazardous Atmosphere	Yes / No ☒ ☐	☒ MSDS Review ☒ Proper containers/labels ☒ PPE ☐ Safety shower identified an available ☐ Fume hoods, glove boxes, etc. ☒ Eye wash station ☐ Asbestos work permit ☐ IH Monitoring Plan for chemical use ☐ Ventilation ☐ Wet Work Methods ☐ Respiratory Protection: ☐ APR ☐ FF ☐ HF ☐ PAPR ☐ Airline ☐ SCBA ☐ Carri-Air ☐ Other: Additional Information: Wear disposable nitrile gloves and replace if they come in contact with sample preservatives. Specify Cartridge(s): Cartridge Change Out Schedule: Task: **General Site Activities** • Maintain an MSDS at the Jobsite for all stored/used chemicals. • Personnel shall review MSDS prior to working with any chemicals.	1,4,6
Pressurized Gas Cylinders	Yes / No ☒ ☐	☒ Caps on while moving ☒ Secured ☐ Suitable lifting moving device Task: **Checking/Recharging Accumulators** • Personnel shall be trained and familiar with the use of pressurized gas in relation to the work task	1,3,6
Potential Contact with Tank Waste	Yes / No ☐ ☒	☐ Silver shield PPE ☐ Respiratory Protection ☐ Gloves ☐ Hood ☐ Apron Task:	NA
Eye, Foot, Head, Hand Hazards	Yes / No ☒ ☐	☒ Safety Glasses ☒ Hard Hat ☒ Face Shield ☐ Chemical Goggles ☒ Leather Gloves ☐ Chemical Gloves ☐ Cut Resistant Gloves ☐ Heat Resistant Gloves ☒ Substantial Footwear ☒ Protective Footwear ☐ Chemical Boots Task: **Pressure Washing** **Driving Casing** **Pulling casing/Sampling Activities** **General Site Activities—Sharp edges** • Wear leather gloves when using tools or handling equipment.	1,3,6
Confined Space	Yes / No ☐ ☒	☐ Permit Required Confined Space ☐ Confined Space Hazard Identification Form Task:	NA

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

WRPS JOB HAZARD ANALYSIS CHECKLIST			
Wall/Ceiling Penetration	Yes / No ☐ ☒	☐ Scanned area where penetration will take place ☐ Perform Walk Around ☐ Engineering Evaluation Completed Task:	NA
Radiological	Yes / No ☒ ☐	☒ Radiological Screening Process ☒ AMW ☐ Mockup performed ☒ Minimize Time ☒ Maximize Distance ☒ Shielding ☒ Respiratory Protection ☐ Contain source ☐ Reduce item generating concern ☒ PPE ☐ Apply fixative ☒ RWP Task: **During Direct push work / Respiratory protection only if needed per work instructions** **General Site Activities** • All employees shall comply with the requirements defined in the client's radiological policies, procedures, and radiological work permit (RWP). • Practice ALARA when arranging work sites to minimize radiation exposures.	1,5,6
Flammable / Explosive Hazards	Yes / No ☒ ☐	☐ Bonding ☐ Intrinsically safe tools/equipment Task: **Use of Portable Heaters** **Use of Portable Generators** **Fueling Equipment** • Refueling of the heaters shall be performed only after the heater has cooled appropriately. • Metal fuel cans with a flash back preventer valve will be used to hold fuel. • Store fuel cans in flammable cabinets.	1 & 6
Tank Farm Vapors or VCZ	Yes / No ☒ ☐	☐ Alternate Entry Method ☐ Temp. VCZ Established ☐ PPE ☒ Current IH Monitoring and Sampling Plan ☐ CEHA # Task: **Sampling and decommissioning** • Monitoring to be performed in accordance with the current C farm IH Monitoring Plan, latest revision, as noted in the work package.	5,6
Lack of Adequate Lighting	Yes / No ☐ ☒	☐ Change work to daytime ☐ Temporary lighting ☐ Light Stand/Plants ☐ Flashlight Task:	NA
Ergonomic	Yes / No ☒ ☐	☒ 2 person lift ☒ Mechanical lift ☒ Stool/Adjust to work Height ☐ Reach Tools ☒ Handling Cart/Dolly ☒ Powered Tools ☒ Anti-Fatigue mat ☒ Worker Rotation ☐ Other Task: **Driving Casing** **Pulling Casing/Sampling Activities** • Take breaks as needed to avoid muscle strain/fatigue. • Avoid twisting while lifting, or similar motions. • Avoid prolonged awkward positions. • Extensive repetitive motion during casing assembly should be mitigated with adjustments to work posture and position.	1, 6
Laboratory Hazards (e.g., Chemical Splashes, Chemical Compatibility, Reactive, Time Sensitive	Yes / No ☐ ☒	☐ PPE ☐ Chemical Segregation ☐ Volume Limitations ☐ Fume Hoods ☐ Special Labeling or Postings Task:	NA

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

WRPS JOB HAZARD ANALYSIS CHECKLIST			
Electrical	Yes / No ☒ ☐	☐ LO/TO ☐ Barricade ☐ EWP ☐ AED Locations ☐ Electrical Hazard Evaluation (Site Form A-6005-432) Task: **Portable Generator** • Inspect generator and electrical cords prior to use. • Test the GFCI prior to use.	1,6
Other **Describe: EMERGENCIES**	Yes / No ☒ ☐	Controls: Task: **Injuries** • For minor injuries, transport injured person to the 200 West Medical Aid Station, 2719-WB Bldg. • For serious or life threatening injuries, call **373-0911** and administer first aid as indicated by the nature of the injury until emergency medical services arrive. • All injuries are to be immediately reported to the field supervisor and site safety representative. • Injuries occurring within a radiological control zone must follow radiological work requirements/procedures **Emergency Evacuations** • All personnel shall respond to Emergency Area alarms by exiting work area and taking appropriate emergency response actions.	1, 6
Other **Describe: WEATHER**	Yes / No ☒ ☐	Controls: Task: **Adverse Weather Conditions** • Respond per AOP **Temperature Extremes** • Brief personnel on symptom recognition and methods of prevention. Use weekly safety meeting to document personnel have been briefed. • Provide drinking water and encourage consumption. • Use portable heaters as needed in the work area. • Wear winter gear. • Allow employees to take warming breaks as needed.	1, 6
Other **Describe: BIOLOGICAL**	Yes / No ☒ ☐	Controls: Task: **General Site Activities** • Watch for spiders when reaching into enclosed spaces. • Be careful when handling equipment that has rested on the ground. • If snakes are encountered, do not attempt to handle or molest them. Monitor the snake's whereabouts until it is safely away from the work site. If needed, call the Pest Control (376-7378) to have the snake removed. • Watch for nesting bees and report to pest control. Employees with allergies should notify the supervisor. • Report all bites and stings.	6
Other **Describe: LIFTING LIMIT**	Yes / No ☒ ☐	Controls: ☒ Worker EJTA allows 50lbs ☒ Review safe lifting techniques during Pre-job. Task: **Probe Placement and Decommissioning Bore Hole** • Individual workers may handle up to 50lbs bags of sand, bentonite, and diatomaceous earth during probe placement and decommissioning activities	6

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

Walk Down/JHA Participants	Date
Kris Hutchings--inspected site from fenceline	11/3/10
Mike Walkup	11/3/10
Mike Ehrogott--inspected site from fenceline, crane parked over site	11/15/10
Olin Amos	11/15/10
Bill Clark	11/15/10
John Dixon	11/15/10

*Method: 1- Skill Based, 2- Precaution/Limitation/Prerequisite, 3- WARNING, 4- Work Instruction, 5- Permit/Plan, 6- Pre-Job Brief

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Field Safety and Health Inspection Repor

Date:	11/17/2010	Time:	0800	Inspected by:	Kris Hutchings
Location:		C Tank farm C104 Angle Push Demonstration @ Energy Northwest Industrial Complex			
Work Activities		Demonstration of angle push plate adapter and push technique			
Weather Conditions		Overcast, light winds 2-6 mph, 20-40F			

Observations

Industrial Hygiene		Industrial Safety					
N/A	IH Monitoring/Sampling	YES	Applicable PPE	YES	Heavy Equipment	N/A	Excavations
N/A	Hazard Communication	YES	Walking/Working Surfaces	N/A	Elevating Work Platforms	N/A	Underground Utilities
N/A	Respiratory Protection	YES	Housekeeping	N/A	Crane and Rigging	N/A	Machine Guarding
N/A	Confined Space	N/A	Showers and Eyewash Stations	N/A	Vehicular Traffic	YES	Rotating/Moving Equipment
N/A	First Aid/injury/illness	N/A	Electrical	YES	Fall Hazards	N/A	Hand/Power Tools
N/A	Heat Stress (WGBT)	N/A	L.O.T.O.	N/A	Falling Objects	N/A	Stored Energy
YES	Ergonomics	N/A	Overhead Utilities	N/A	Ladders and Stairs	YES	Pinch Points
N/A	Ventilation/IEQ	YES	Signs and Barricades	N/A	Scaffolds	YES	Applicable Permits
YES	Noise and/or Vibration	N/A	Fire Hazards	N/A	Air/Steam/Fluid > 500 psi	N/A	Pre-Job Meetings
N/A	Lighting	N/A	Compressed Gas Storage	N/A	Steam/Fluid >200°F	YES	Work Documents
N/A	Other IH	N/A	Exits/Doors/Fire Lanes	YES	Employee Concern	N/A	Other (Safety)

Comments/Items needing addressed

Crews gathered for demonstration of the use of the angle plate adapter for to be used in the C-104 angle push project. The plate had been leveled and set in alignment with the azimuth line GPS surveyed the previous day. The crew worked to drive a single rack of approximately 6 segments. Observers were located behind a barrier set at approximately 60' distance from the HHU-XL and were instructed to wear single hearing protection while the demonstration took place. A step ladder was used to access the joint for breaking and making connections. It was recommended after the demonstration that a shorter footplate be used to lower the working height for the driller and helper. Additionally it was recommended that to prevent the tip from jumping on the surface, a pilot hole be started to create a face for the drill head. It appeared that the workers would be able to perform the task adequately without any special accommodations. A sound level meter registered around 110 dBA during the push activities, within range of the normal operation parameters. Crews were reminded to continue to wear double hearing protection while driving casing. A concern was mentioned that workers would be in close proximity to the slope separating the upper half of C tank farm from the lower half. It was determined that the crew would rope off the work area as usual and that their distance from the slope should be adequate to prevent a fall. The demonstration did not reveal any cause for concern. Images from the demonstration are attached on the next page.

Signature/Date		*Review Signature/Date*	
	11/17/2010		

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Figure 1--Close up of the Angle Plate and the footplate of the drill.

Figure 2--HHU-XL positioned and beginning the angle push demonstration

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Figure 3--Worker required ladder to reach pipe joint

Figure 4--Driller attaching dual string to prepare for "sampling" during the demonstration

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Date:	12/21/2010	Time:	1000	Inspected by:	Kris Hutchings
Location:		C Tank farm C104 Angle Push Project Trailer			
Work Activities		Crew waiting on Standby for Work Package			
Weather Conditions		Overcast, light winds 2-6 mph, 20-40F			

Observations

Industrial Hygiene		Industrial Safety					
N/A	IH Monitoring/Sampling	N/A	Applicable PPE	N/A	Heavy Equipment	N/A	Excavations
N/A	Hazard Communication	N/A	Walking/Working Surfaces	N/A	Elevating Work Platforms	N/A	Underground Utilities
N/A	Respiratory Protection	N/A	Housekeeping	N/A	Crane and Rigging	N/A	Machine Guarding
N/A	Confined Space	N/A	Showers and Eyewash Stations	N/A	Vehicular Traffic	N/A	Rotating/Moving Equipment
N/A	First Aid/injury/illness	N/A	Electrical	N/A	Fall Hazards	N/A	Hand/Power Tools
N/A	Heat Stress (WGBT)	N/A	L.O.T.O.	N/A	Falling Objects	N/A	Stored Energy
YES	Ergonomics	N/A	Overhead Utilities	N/A	Ladders and Stairs	N/A	Pinch Points
N/A	Ventilation/IEQ	YES	Signs and Barricades	N/A	Scaffolds	N/A	Applicable Permits
N/A	Noise and/or Vibration	N/A	Fire Hazards	N/A	Air/Steam/Fluid > 500 psi	N/A	Pre-Job Meetings
N/A	Lighting	N/A	Compressed Gas Storage	N/A	Steam/Fluid >200°F	N/A	Work Documents
N/A	Other IH	N/A	Exits/Doors/Fire Lanes	YES	Employee Concern	N/A	Other (Safety)

Comments/Items needing addressed

Visited with crews about the start of the work package. A question was raised about communication with our crew inside the farms. When equipment is driving it is difficult to communicate critical information, such as in the event of an emergency. The concern arose from work in the BY-East project, being out of line of site and the inability to trigger the remote strobe light and alarm. A commitment to discuss the item further in the kick off meeting was made.

Signature/Date	[illegible]	*Review Signature/Date*	12/21/2011

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Field Safety and Health Inspection Repor

Date:	12/28/2010	Time:	1000	Inspected by:	Kris Hutchings
Location:		C Tank farm C104 Angle Push Project Trailer			
Work Activities		Kick off meeting for the C-104 Angle Push			
Weather Conditions		Overcast, light winds 2-6 mph, 20-40F			

Observations

Industrial Hygiene		Industrial Safety					
N/A	IH Monitoring/Sampling	N/A	Applicable PPE	N/A	Heavy Equipment	N/A	Excavations
N/A	Hazard Communication	N/A	Walking/Working Surfaces	N/A	Elevating Work Platforms	N/A	Underground Utilities
N/A	Respiratory Protection	N/A	Housekeeping	N/A	Crane and Rigging	N/A	Machine Guarding
N/A	Confined Space	N/A	Showers and Eyewash Stations	N/A	Vehicular Traffic	N/A	Rotating/Moving Equipment
N/A	First Aid/injury/illness	N/A	Electrical	N/A	Fall Hazards	N/A	Hand/Power Tools
N/A	Heat Stress (WGBT)	N/A	L.O.T.O.	N/A	Falling Objects	N/A	Stored Energy
YES	Ergonomics	N/A	Overhead Utilities	N/A	Ladders and Stairs	N/A	Pinch Points
N/A	Ventilation/IEQ	YES	Signs and Barricades	N/A	Scaffolds	N/A	Applicable Permits
N/A	Noise and/or Vibration	N/A	Fire Hazards	N/A	Air/Steam/Fluid > 500 psi	N/A	Pre-Job Meetings
N/A	Lighting	N/A	Compressed Gas Storage	N/A	Steam/Fluid >200°F	N/A	Work Documents
N/A	Other IH	N/A	Exits/Doors/Fire Lanes	YES	Employee Concern	N/A	Other (Safety)

Comments/Items needing addressed

Attended morning POD to discuss the C104 project and review the work package. Work package was thoroughly reviewed by Field Work Supervisor. The JHA was briefly reviewed and each employee instructed to read and be familiar with the document and sign the reading acknowledgment sheet. Additional questions were asked about the start time and other project details. The concern of communication was mentioned with the whole group. It was determined that the lack of a clear method to communicate with the workers inside the farm operating the HHU and HHU-XL units was a safety concern. A mention of utilizing two radios and the two assigned support personnel was discussed. This process would entail the presence of a support person in the farm with a radio, but distanced away from the drilling equipment to allow for clear communication. A second support person or assigned individual outside of the farm would relay important information to the inside point of contact. The inside point of contact would then relay the information to the drillers. This approach was rejected by the support personnel present at the meeting as not meeting ALARA in their opinions. A second option was available, such as communication devices for loud environments that would allow the drill operators to hear critical communications from outside the farm. When this option was presented the support personnel deemed it an appropriate solution. A commitment was made to research some communication measures that were affordable and appropriate for the working environment. Workers were able to enter the farm and determine that a new GPS survey would be required for the angle push work area.

Signature/Date	[illegible] 12/28/10	*Review Signature/Date*	

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Field Safety and Health Inspection Report

Date:	1/3/2011	Time:	0800	Inspected by:	Kris Hutchings
Location:		C Tank farm C104 Angle Push Project Trailer			
Work Activities		POD meeting for the C-104 Angle Push			
Weather Conditions		Overcast, light winds 2-6 mph, 20-40F			

Observations

Industrial Hygiene		Industrial Safety					
N/A	IH Monitoring/Sampling	N/A	Applicable PPE	N/A	Heavy Equipment	N/A	Excavations
N/A	Hazard Communication	N/A	Walking/Working Surfaces	N/A	Elevating Work Platforms	N/A	Underground Utilities
N/A	Respiratory Protection	N/A	Housekeeping	N/A	Crane and Rigging	N/A	Machine Guarding
N/A	Confined Space	N/A	Showers and Eyewash Stations	N/A	Vehicular Traffic	N/A	Rotating/Moving Equipment
N/A	First Aid/injury/illness	N/A	Electrical	N/A	Fall Hazards	N/A	Hand/Power Tools
N/A	Heat Stress (WGBT)	N/A	L.O.T.O.	N/A	Falling Objects	N/A	Stored Energy
N/A	Ergonomics	N/A	Overhead Utilities	N/A	Ladders and Stairs	N/A	Pinch Points
N/A	Ventilation/IEQ	N/A	Signs and Barricades	N/A	Scaffolds	N/A	Applicable Permits
N/A	Noise and/or Vibration	N/A	Fire Hazards	N/A	Air/Steam/Fluid > 500 psi	N/A	Pre-Job Meetings
N/A	Lighting	N/A	Compressed Gas Storage	N/A	Steam/Fluid >200°F	N/A	Work Documents
N/A	Other IH	N/A	Exits/Doors/Fire Lanes	YES	Employee Concern	N/A	Other (Safety)

Comments/Items needing addressed

Attended the morning POD meeting. The angle plate was waiting to be placed inside the farm. Construction crews were pumping concrete which did not allow other projects entry into the farm. In addition a wrapped pump section was in the way of the angle push site (figure 1,2). Arrangements were made to utilize a forklift to move the angle plate into position as practiced at the C104 angle push demonstration. As a follow up on worksite communication options, a bull horn was utilized at the BY-East project to gain the attention of the drilling crew. Despite their close proximity, they were unable to hear the instructions over the bull horn or the fog horn. After two minutes the workers acknowledged the horn when they looked toward the change trailer and saw it. The bull horn is probably not a viable emergency communication device when the drilling crew is driving pipe/equipment is operating. No other safety issues were noted.

Signature/Date	1/3/11	*Review Signature/Date*	

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Field Safety and Health Inspection Report					
Date	1/26/2011	*Time*	0700-1100	*Inspected by*	Kris Hutchings Click here to enter text.
Location	C Tank Farm, C104 Angle Push Project, Hanford, WA				
Work Activities	Crew was preparing for GYRO results prior to initating work				
Weather Conditions	Partly cloudy, 20-40 F, light breeze				

Observations (check all that apply)							
Industrial Hygiene		*Industrial Safety*					
☐	IH Monitoring/Sampling	☒	Applicable PPE	☐	Heavy Equipment	☐	Excavations
☐	Hazard Communication	☒	Walking/Working Surfaces	☐	Elevating Work Platforms	☐	Underground Utilities
☐	Respiratory Protection	☒	Housekeeping	☐	Crane and Rigging	☐	Machine Guarding
☐	Confined Space	☐	Showers and Eyewash Stations	☐	Vehicular Traffic	☐	Rotating/Moving Equipment
☐	First Aid/Injury/Illness	☐	Electrical	☐	Fall Hazards	☐	Hand/Power Tools
☐	Heat Stress (WGBT)	☐	L.O.T.O.	☐	Falling Objects	☐	Stored Energy
☐	Ergonomics	☐	Overhead Utilities	☒	Ladders and Stairs	☐	Pinch Points
☐	Ventilation/IEQ	☒	Signs and Barricades	☐	Scaffolds	☒	Applicable Permits
☐	Noise and/or Vibration	☐	Fire Hazards	☐	Air/Steam/Fluid > 500 psi	☐	P.O.D. Meeting
☐	Lighting	☐	Compressed Gas Storage	☐	Steam/Fluid >200°F	☒	Work Documents
☒	Other IH	☒	Exits/Doors/Fire Lanes	☐	Employee Concern	☐	Other (Safety)

Comments/Items needing addressed

Moring POD was not attended, but work package was viewed and all applicable documents were in place. Workers were waiting for GYRO results to determine the trueness of the angle push advancement from the previous GYRO measurement at a shallower depth. Observed the HHU-XL jobsite and found no housekeeping violations. Also observed the new rope stations that were built with integrated applicable signage (figure 1). Crew was unable to label the energy cut off switch on the HHU-XL as the weather was not conducive. Advised the workers to complete the process as quickly as

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Field Safety and Health Inspection Report REV 1 2/2/11

possible, to take a picture of the labeled energy cut off point, and to submit that image to the field work supervisor. 8 point criteria LOTO was implemented for routine normal operating procedure minor tooling actions of changing lynch pins, retainer pins, and drill heads until a decision is made by WRPS safety regarding the matter. Tentatively plan a Friday morning demonstration of the process to WRPS safety, field work supervisors, and NCO's to clarify normal operating procedures.			
Signature/Date	[illegible]	Review Signature/Date	
	1/26/2011		

Figure 1—Detail of new integrated signage on rope station.

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Field Safety and Health Inspection Report

REV 1 2/2/11

Field Safety and Health Inspection Report					
Date	2/1/2011	*Time*	0700-1100	*Inspected by*	Kris Hutchings Marty Gardner
Location	C Tank Farm, C104 Angle Push Project, Hanford, WA				
Work Activities	Crew was allowed to return to work following GYRO results. Work plan included utilizing an Electrician escort to recover carts and access pipe				
Weather Conditions	Partly cloudy, 20-40 F, light breeze				

Observations (check all that apply)							
Industrial Hygiene		*Industrial Safety*					
☐	IH Monitoring/Sampling	☒	Applicable PPE	☐	Heavy Equipment	☐	Excavations
☐	Hazard Communication	☒	Walking/Working Surfaces	☐	Elevating Work Platforms	☐	Underground Utilities
☐	Respiratory Protection	☒	Housekeeping	☐	Crane and Rigging	☐	Machine Guarding
☐	Confined Space	☐	Showers and Eyewash Stations	☐	Vehicular Traffic	☐	Rotating/Moving Equipment
☐	First Aid/Injury/Illness	☒	Electrical	☐	Fall Hazards	☐	Hand/Power Tools
☐	Heat Stress (WGBT)	☒	L.O.T.O.	☐	Falling Objects	☐	Stored Energy
☒	Ergonomics	☐	Overhead Utilities	☒	Ladders and Stairs	☐	Pinch Points
☐	Ventilation/IEQ	☐	Signs and Barricades	☐	Scaffolds	☒	Applicable Permits
☐	Noise and/or Vibration	☐	Fire Hazards	☐	Air/Steam/Fluid > 500 psi	☐	P.O.D. Meeting
☐	Lighting	☐	Compressed Gas Storage	☐	Steam/Fluid >200°F	☒	Work Documents
☒	Other IH	☒	Exits/Doors/Fire Lanes	☒	Employee Concern	☐	Other (Safety)

Comments/Items needing addressed

Arrived at the job site after the completion of the P.O.D. Workers were waiting for an Electrician to escort then into a posted area to retrieve pipe and to retrive a cart. The crew was instructed that the current interpretation of LOTO requirments as determined at meeting 1/31/11, stated that 8 point criteria LOTO was applicable to changing lynch pins, retainer pins, and drive heads. Arranged an oportunity to visit with the Field work supervisor at their office RE 40lb lift limit. Previous JHA documents had allowed workers to lift the 50lb bags of bentonite as part of decommissioning. However

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a WRPS general JHA document has a 40lb weight limit. After discussion with the field work supervisior the consensus was to pursue an addition to the JHA to allow for 50lb wieght limits for the specific task of decommissioning the borehole. A question on the application of 8 point criteria was directed toward the SME of WRPS: "Does the checklist need to be done each time the 8 point criteria was used-to LOTO, as a literal reading of the DOE 0336 proceedure may imply?" The worksite was clean and workers we instructued to take warming breaks as needed due to the cold weather.			
Signature/Date	[illegible]	Review Signature/Date	
	2/1/11		

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Field Safety and Health Inspection Report

REV 1 2/2/11

Field Safety and Health Inspection Report					
Date	2/3/2011	*Time*	0800-1100	*Inspected by*	Kris Hutchings
Location	C Tank Farm, C104 Angle Push Projet, Hanford, WA				
Work Activities	Crew was driving the final sections of pipe to reach total depth.				
Weather Conditions	Mostly clear skies, 20-40 F				

Observations (check all that apply)							
Industrial Hygiene		*Industrial Safety*					
☐	IH Monitoring/Sampling	☒	Applicable PPE	☐	Heavy Equipment	☐	Excavations
☐	Hazard Communication	☒	Walking/Working Surfaces	☐	Elevating Work Platforms	☐	Underground Utilities
☐	Respiratory Protection	☒	Housekeeping	☐	Crane and Rigging	☐	Machine Guarding
☐	Confined Space	☐	Showers and Eyewash Stations	☐	Vehicular Traffic	☒	Rotating/Moving Equipment
☐	First Aid/Injury/Illness	☐	Electrical	☒	Fall Hazards	☐	Hand/Power Tools
☐	Heat Stress (WGBT)	☒	L.O.T.O.	☐	Falling Objects	☐	Stored Energy
☒	Ergonomics	☐	Overhead Utilities	☐	Ladders and Stairs	☐	Pinch Points
☐	Ventilation/IEQ	☒	Signs and Barricades	☐	Scaffolds	☐	Applicable Permits
☒	Noise and/or Vibration	☐	Fire Hazards	☐	Air/Steam/Fluid > 500 psi	☐	P.O.D. Meeting
☐	Lighting	☐	Compressed Gas Storage	☐	Steam/Fluid >200°F	☒	Work Documents
☒	Other IH	☐	Exits/Doors/Fire Lanes	☐	Employee Concern	☒	Other (Safety)

Comments/Items needing addressed

Arrived onsite and reviewed POD documentation, and signed daily plan. Entered C Farm and inspected jobsite. Workers had placed the site boundary at the greatest feasible distance from the HHU-XL location. Appropriate signage was observed and the crew had no random items laying on the ground. The power cut off switch was labled clearly. During the observation a worker showed a rachet wrench that had been bent and removed from service during the project. The slope at the project site was protected by a metal fence to prevent workers from falling down into the lower farm area. The distance

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between the barrier and the work area was sufficent enough to not negitively impact work flow (attachement). Video was taken during the observation period of the drilling proceses. Observed a lynch pin break and the workers respond with LOTO after reviewing the 8 point criteria check list. The HHU-XL was shut down, locked out, and the pin was replaced. After removing the lock the work resumed. Observed the workers adding segments of pipe. Workers appear to have adjusted to the angled postion of the drill string without adopting awkward postures during making and breaking pipe joint sections. Questioned NCO's about radio checks prior to daily use. They stated that the checks were going great, and that they were hoping the cell phones would be availible soon.

Signature/Date		Review Signature/Date	
	2/3/11		

Attachments

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Field Safety and Health Inspection Report

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Field Safety and Health Inspection Report					
Date	2/15/2011	*Time*	0900-1130	*Inspected by*	Kris Hutchings Click here to enter text.
Location	C Farm, C104 Angle Push Project, Hanford WA				
Work Activities	Workers were waiting on entry for the C104 project. A power outage had slowed work.				
Weather Conditions	Cloudy skies, approximately 43 F, rain on and off again				

Observations (check all that apply)							
Industrial Hygiene		*Industrial Safety*					
☐	IH Monitoring/Sampling	☒	Applicable PPE	☒	Heavy Equipment	☐	Excavations
☐	Hazard Communication	☐	Walking/Working Surfaces	☐	Elevating Work Platforms	☐	Underground Utilities
☐	Respiratory Protection	☐	Housekeeping	☐	Crane and Rigging	☐	Machine Guarding
☐	Confined Space	☐	Showers and Eyewash Stations	☐	Vehicular Traffic	☐	Rotating/Moving Equipment
☐	First Aid/Injury/Illness	☐	Electrical	☒	Fall Hazards	☐	Hand/Power Tools
☐	Heat Stress (WGBT)	☒	L.O.T.O.	☐	Falling Objects	☐	Stored Energy
☒	Ergonomics	☐	Overhead Utilities	☐	Ladders and Stairs	☐	Pinch Points
☐	Ventilation/IEQ	☒	Signs and Barricades	☐	Scaffolds	☐	Applicable Permits
☒	Noise and/or Vibration	☐	Fire Hazards	☐	Air/Steam/Fluid > 500 psi	☐	P.O.D. Meeting
☐	Lighting	☐	Compressed Gas Storage	☐	Steam/Fluid >200°F	☒	Work Documents
☐	Other IH	☐	Exits/Doors/Fire Lanes	☐	Employee Concern	☐	Other (Safety)

Comments/Items needing addressed

Crew was waiting at work trailer for a work package revision. After the field work supervisor reviewed the work package for the day it was determined that work would begin following lunch. Workers reviewed the operation of the radios and a point of confusion on the proper channel was observed. It is recommended that the operation of the radios be reviewed. Additionally it is recommended that a determination on the proper channels for the radio should be made. Reviewed with the workers the change to the JHA to allow lifting up to 50lbs during decommissioning and prove placement work evolutions.

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Field Safety and Health Inspection Report

REV 1 2/2/11

Signature/Date		Review Signature/Date	
	2/15/11		

Attachments

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