0076482

SAF-RC-029
Remaining Sites Confirmation Sampling - Soil
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1037 SAF-RC-029

Waste Site: 100-F-46

RECEIVED
MAR 18 2008
EDMC

Date: 21 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-46
Subject: Radiochemistry - Data Package No. K1037-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1037 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16355	11/29/07	Soil	C	See note 1
J16356	11/29/07	Soil	C	See note 1

1 – Gross alpha/beta, tritium, carbon-14, isotopic plutonium (aspec) and gamma spectroscopy.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of a matrix spike analysis, all tritium and carbon-14 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate

analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J16355/J16356) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K1037 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike analysis, all tritium and carbon-14 results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1037	REVIEWER: ELR	Project: 100-F-46	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14 Tritium	J	All	No matrix spike analysis

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-001 J16355

DATA SHEET

SDG	7721	Client/Case no	Hanford	SDG K1037	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R712015-01	Client sample id	J16355		
Dept sample id	7721-001	Location/Matrix	100-F-46	SOLID	
Received	12/04/07	Collected/Weight	11/29/07 13:05	1375 g	
% solids	94.8	Custody/SAF No	RC-029-031	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	9.57	6.4	8.00	10.0		93A
Gross Beta	12587-47-2	20.9	4.3	5.33	15.0		93B
Tritium	10028-17-8	33.8	5.3	7.51	400	J	H
Carbon 14	14762-75-5	0.136	2.0	3.40	50.0	U J	C
Plutonium 238	13981-16-3	0.030	0.12	0.291	1.00	U	PU
Plutonium 239/240	PU-239/240	0.030	0.061	0.232	1.00	U	PU
Potassium 40	13966-00-2	15.7	0.70	0.191			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.020	0.100	U	GAM
Radium 226	13982-63-3	0.526	0.047	0.040	0.100		GAM
Radium 228	15262-20-1	0.678	0.091	0.087	0.200		GAM
Europium 152	14683-23-9	U		0.059	0.100	U	GAM
Europium 154	15585-10-1	U		0.071	0.100	U	GAM
Europium 155	14391-16-3	U		0.075	0.100	U	GAM
Thorium 228	14274-82-9	0.660	0.032	0.030			GAM
Thorium 232	TH-232	0.678	0.091	0.087			GAM
Uranium 235	15117-96-1	U		0.112		U	GAM
Uranium 238	U-238	U		2.38		U	GAM
Americium 241	14596-10-2	U		0.147		U	GAM

Remaining Sites Confirmation Samplin

2/20/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-002 J16356

DATA SHEET

SDG	7721	Client/Case no	Hanford	SDG K1037	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R712015-02	Client sample id	J16356		
Dept sample id	7721-002	Location/Matrix	100-F-46	SOLID	
Received	12/04/07	Collected/Weight	11/29/07 13:10	1339 g	
% solids	94.6	Custody/SAF No	RC-029-031	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	15.7	7.6	8.39	10.0		93A
Gross Beta	12587-47-2	17.4	4.3	5.61	15.0		93B
Tritium	10028-17-8	0.058	4.5	7.52	400	U J	H
Carbon 14	14762-75-5	1.00	2.0	3.25	50.0	U J	C
Plutonium 238	13981-16-3	0.072	0.14	0.274	1.00	U	PU
Plutonium 239/240	PU-239/240	0.036	0.072	0.274	1.00	U	PU
Potassium 40	13966-00-2	14.6	0.93	0.494			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Cesium 137	10045-97-3	U		0.035	0.100	U	GAM
Radium 226	13982-63-3	0.491	0.085	0.081	0.100		GAM
Radium 228	15262-20-1	0.886	0.17	0.152	0.200		GAM
Europium 152	14683-23-9	U		0.095	0.100	U	GAM
Europium 154	15585-10-1	U		0.139	0.100	U	GAM
Europium 155	14391-16-3	U		0.110	0.100	U	GAM
Thorium 228	14274-82-9	0.826	0.076	0.077			GAM
Thorium 232	TH-232	0.886	0.17	0.152			GAM
Uranium 235	15117-96-1	U		0.172		U	GAM
Uranium 238	U-238	U		4.86		U	GAM
Americium 241	14596-10-2	U		0.344		U	GAM

Remaining Sites Confirmation Samplin

2/20/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/19/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1037 was composed of two solid (soil) samples designated under SAF No. RC-029 with a Project Designation of: Remaining Sites Confirmation Sampling-Soil.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 19, 2007.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.4 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Mel Mann
Melissa C. Mannion
Senior Program Manager

12/20/07
Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-031	Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-46 K1057 (7721)		SAF No.: RC-029
Ice Chest No.: ERC-04-003	Field Logbook No.: EL-1601	COA: C00F46A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES ~~LIONVILLE~~ BH 11/29/07	Offsite Property No.: A080085		Bill of Lading/Air Bill No.: 2e 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000014

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	P	G/P	G	G/P	aG	aG	G				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	PAHs - 8310	TPH (Total) - 418.1				

Sample No.	Matrix *	Sample Date	Sample Time									
J16355	SOIL	11/29/07	1305	X	X							
J16356	SOIL	11/29/07	1310	X	X							
~~J16357~~	~~SOIL~~	~~11/29/07~~	~~1300~~ BH 11/29/07									
~~J16358~~	~~SOIL~~	BH										
~~J16359~~	~~SOIL~~	11/29/07										

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 12 3 07.
Sampler unavailable to relinquish

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	11/29/07 1340	BHUDSON BHudson	11/29/07 1310
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
BHudson BHudson	11/29/07 1530	3728 #2C	11/29/07 1530
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728 #2C	12-3-07 0900	[signature]	12-3-07 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	12-3-07 1500	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX		[signature]	12/04/07 09:30
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on ~~{Americium-241}; Americium-241~~, Gross Alpha & Gross Beta; ~~Nickel-63~~; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; ~~Strontium-89,90 - Total Sr; Technetium-99;~~ ~~Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Total Uranium~~
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470

12-3-07 12-3-07 12-3-07 12-3-07

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-44			DATA PACKAGE: K1037		
VALIDATOR: ELR		LAB: EB		DATE: 2/19/08	
			SDG: K1037		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C-14		
SAMPLES/MATRIX					
J16355	J16356				
					Soil

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no 3H or C-14 MS

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no FS or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: 2 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-004 Method Blank

METHOD BLANK

SDG	7721	Client/Case no	Hanford	SDG K1037	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R712015-04	Client sample id	Method Blank		
Dept sample id	7721-004	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-2.66	3.1	8.14	10.0	U	93A
Gross Beta	12587-47-2	-0.544	5.4	9.09	15.0	U	93B
Tritium	10028-17-8	1.08	4.7	7.83	400	U	H
Plutonium 238	13981-16-3	0.038	0.15	0.368	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.077	0.294	1.00	U	PU
Potassium 40	13966-00-2	U		0.168		U	GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.100	U	GAM
Radium 226	13982-63-3	U		0.026	0.100	U	GAM
Radium 228	15262-20-1	U		0.056	0.200	U	GAM
Europium 152	14683-23-9	U		0.026	0.100	U	GAM
Europium 154	15585-10-1	U		0.036	0.100	U	GAM
Europium 155	14391-16-3	U		0.024	0.100	U	GAM
Thorium 228	14274-82-9	U		0.017		U	GAM
Thorium 232	TH-232	U		0.056		U	GAM
Uranium 235	15117-96-1	U		0.041		U	GAM
Uranium 238	U-238	U		1.32		U	GAM
Americium 241	14596-10-2	U		0.014		U	GAM

Remaining Sites Confirmation Samplin

QC-BLANK #63945

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-007 Method Blank

METHOD BLANK

SDG	7721	Client/Case no	Hanford	SDG K1037	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R712015-07	Client sample id	Method Blank		
Dept sample id	7721-007	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.19	2.1	3.52	50.0	U	C

Remaining Sites Confirmation Samplin

QC-BLANK #64090

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7721

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1037

Contract No. 630

Lab sample id R712015-03

Dept sample id 7721-003

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	137	19	8.63	10.0		93A	111	4.4	123	55-145	70-130
Gross Beta	115	8.2	6.01	15.0		93B	113	4.5	102	74-126	80-120
Tritium	556	20	10.7	400		H	630	25	88	85-115	80-120
Plutonium 238	25.2	2.8	0.324	1.00		PU	26.0	1.0	97	81-119	80-120
Plutonium 239/240	28.9	3.1	0.258	1.00		PU	29.0	1.2	100	81-119	80-120
Cobalt 60	0.721	0.050	0.028	0.050		GAM	0.710	0.028	102	74-126	80-120
Cesium 137	0.784	0.043	0.030	0.100		GAM	0.752	0.030	104	74-126	80-120

Remaining Sites Confirmation Samplin

QC-LCS #63944

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-006

Lab Control Sample

LAB CONTROL SAMPLE

SDG	7721	Client/Case no	Hanford SDG K1037
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R712015-06	Client sample id	Lab Control Sample
Dept sample id	7721-006	Material/Matrix	SOLID
		SAF No	RC-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	1400	14	3.68	50.0		C	1600	64	88	86-114	80-120

Remaining Sites Confirmation Samplin

QC-LCS #64089

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LCS
Version	3.06
Report date	12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-005 J16355

DUPLICATE

SDG	7721			Client/Case no	Hanford SDG K1037
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R712015-05	Lab sample id	R712015-01	Client sample id	J16355
Dept sample id	7721-005	Dept sample id	7721-001	Location/Matrix	100-F-46 SOLID
		Received	12/04/07	Collected/Weight	11/29/07 13:05 1375 g
% solids	94.8	% solids	94.8	Custody/SAF No	RC-029-031 RC-029

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Gross Alpha	7.89	7.1	10.2	10.0	U	93A	9.57	6.4	8.00		19	170	0.3
Gross Beta	21.7	4.4	5.35	15.0		93B	20.9	4.3	5.33		4	54	0.2
Tritium	35.1	5.3	7.56	400		H	33.8	5.3	7.51		4	39	0.3
Plutonium 238	0.033	0.13	0.253	1.00	U	PU	0.030	0.12	0.291	U	-		0
Plutonium 239/240	0.033	0.066	0.253	1.00	U	PU	0.030	0.061	0.232	U	-		0.1
Potassium 40	14.9	0.75	0.218			GAM	15.7	0.70	0.191		5	33	0.5
Cobalt 60	U		0.024	0.050	U	GAM	U		0.021	U	-		0.2
Cesium 137	U		0.025	0.100	U	GAM	U		0.020	U	-		0.3
Radium 226	0.506	0.057	0.052	0.100		GAM	0.526	0.047	0.040		4	38	0.3
Radium 228	0.792	0.14	0.117	0.200		GAM	0.678	0.091	0.087		16	47	1.0
Europium 152	U		0.062	0.100	U	GAM	U		0.059	U	-		0.1
Europium 154	U		0.081	0.100	U	GAM	U		0.071	U	-		0.2
Europium 155	U		0.109	0.100	U	GAM	U		0.075	U	-		0.5
Thorium 228	0.683	0.037	0.035			GAM	0.660	0.032	0.030		3	34	0.3
Thorium 232	0.792	0.14	0.117			GAM	0.678	0.091	0.087		16	47	1.0
Uranium 235	U		0.109		U	GAM	U		0.112	U	-		0
Uranium 238	U		2.93		U	GAM	U		2.38	U	-		0.3
Americium 241	U		0.156		U	GAM	U		0.147	U	-		0.1

Remaining Sites Confirmation Samplin

QC-DUP#1 63946

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/19/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1037

7721-008 J16355

DUPLICATE

SDG	7721			Client/Case no	Hanford SDG K1037
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R712015-08	Lab sample id	R712015-01	Client sample id	J16355
Dept sample id	7721-008	Dept sample id	7721-001	Location/Matrix	100-F-46 SOLID
		Received	12/04/07	Collected/Weight	11/29/07 13:05 1375 g
% solids	94.8	% solids	94.8	Custody/SAF No	RC-029-031 RC-029

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Carbon 14	-0.133	2.0	3.34	50.0	U	C	0.136	2.0	3.40	U	-		0.2

Remaining Sites Confirmation Samplin

QC-DUP#1A1 #64091

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/19/07

Date: 21 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-46
Subject: Inorganics - Data Package No. K1037-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1037 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16355	11/29/07	Soil	C	See note 1
J16356	11/29/07	Soil	C	See note 1
J16357	11/29/07	Soil	C	See note 1
J16355-T	11/29/07	Soil	C	See note 2
J16356-T	11/29/07	Soil	C	See note 2
J16357-T	11/29/07	Soil	C	See note 2

1 - ICP metals (6010B) and mercury (7471A).
2 – TCLP (1311/6010).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

Due to the holding time being exceeded by less than twice the limit, all mercury results in samples J16355, J16356 and J16357 were qualified as

estimates and flagged "J".

All other holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the arsenic results in samples J16355-T, J16356-T and J16357-T were qualified as estimates and flagged "UJ".

Due to method blank contamination, the lead result in sample J16357 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

Two field blanks (J16357 & J16357-T) were submitted for analysis. Aluminum, barium, calcium, cobalt, copper, iron, potassium, magnesium, manganese, sodium, silicon, vanadium and zinc were detected in equipment blank J16357. Barium, chromium and selenium were detected in equipment blank J16357-T. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (65%), the silver result in samples J16355-T, J16356-T and J16357-T were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

Two sets of field duplicates (J16355/J16356 & J16355-T/J16356-T) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. The RPD for selenium (34%) was outside QC limits in sample duplicate pair (J16355/J16356). Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K1037 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the holding time being exceeded by less than twice the limit, all mercury results in samples J16355, J16356 and J16357 were qualified as estimates and flagged "J".

- Due to method blank contamination, the arsenic results in samples J16355-T, J16356-T and J16357-T were qualified as estimates and flagged "UJ".

- Due to method blank contamination, the lead result in sample J16357 was qualified as an estimate and flagged "UJ".

- Due to a matrix spike recovery outside QC limits (65%), the silver result in samples J16355-T, J16356-T and J16357-T were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: K1037	REVIEWER: ELR	Project: 100-F-46	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	J16355, J16356 J16357	Holding time
Arsenic	UJ	J16355-T, J16356-T J16357-T	Method blank contamination
Lead	UJ	J16357	Method blank contamination
Silver	J	J16355-T, J16356-T J16357-T	Matrix spike recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16355	Silver, Total	0.28 u	MG/KG	0.28	3.0
		Aluminum, Total	5420	MG/KG	11.2	3.0
		Arsenic, Total	1.6	MG/KG	1.4	3.0
		Boron, Total	3.5	MG/KG	1.4	3.0
		Barium, Total	52.6	MG/KG	0.28	3.0
		Beryllium, Total	0.51	MG/KG	0.14	3.0
		Calcium, Total	6240	MG/KG	11.2	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	4.9	MG/KG	0.56	3.0
		Chromium, Total	7.7	MG/KG	0.56	3.0
		Copper, Total	11.7	MG/KG	0.56	3.0
		Iron, Total	13000	MG/KG	12.6	3.0
		Mercury, Total	0.01 u J	MG/KG	0.01	1.0
		Potassium, Total	844	MG/KG	11.2	3.0
		Magnesium, Total	3810	MG/KG	7.0	3.0
		Manganese, Total	221	MG/KG	0.11	3.0
		Molybdenum, Total	0.84 u	MG/KG	0.84	3.0
		Sodium, Total	211	MG/KG	5.6	3.0
		Nickel, Total	8.7	MG/KG	0.56	3.0
		Lead, Total	5.2	MG/KG	0.84	3.0
		Antimony, Total	1.2	MG/KG	0.84	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	2470	MG/KG	11.2	3.0
		Vanadium, Total	30.0	MG/KG	0.39	3.0
		Zinc, Total	28.4	MG/KG	1.7	3.0

2/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J16356	Silver, Total	0.38	MG/KG	0.29	3.0
		Aluminum, Total	5820	MG/KG	11.4	3.0
		Arsenic, Total	1.9	MG/KG	1.4	3.0
		Boron, Total	3.9	MG/KG	1.4	3.0
		Barium, Total	57.7	MG/KG	0.29	3.0
		Beryllium, Total	0.51	MG/KG	0.14	3.0
		Calcium, Total	6550	MG/KG	11.4	3.0
		Cadmium, Total	0.14 u	MG/KG	0.14	3.0
		Cobalt, Total	5.2	MG/KG	0.57	3.0
		Chromium, Total	8.5	MG/KG	0.57	3.0
		Copper, Total	12.0	MG/KG	0.57	3.0
		Iron, Total	15200	MG/KG	12.9	3.0
		Mercury, Total	0.01 u J	MG/KG	0.01	1.0
		Potassium, Total	907	MG/KG	11.4	3.0
		Magnesium, Total	4130	MG/KG	7.1	3.0
		Manganese, Total	245	MG/KG	0.11	3.0
		Molybdenum, Total	0.86 u	MG/KG	0.86	3.0
		Sodium, Total	203	MG/KG	5.7	3.0
		Nickel, Total	9.0	MG/KG	0.57	3.0
		Lead, Total	5.5	MG/KG	0.86	3.0
		Antimony, Total	0.86 u	MG/KG	0.86	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	1750	MG/KG	11.4	3.0
		Vanadium, Total	34.2	MG/KG	0.40	3.0
		Zinc, Total	30.6	MG/KG	1.7	3.0

2/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0801L380

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J16357	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	44.7	MG/KG	3.7	1.0
		Arsenic, Total	0.46 u	MG/KG	0.46	1.0
		Boron, Total	0.46 u	MG/KG	0.46	1.0
		Barium, Total	1.4	MG/KG	0.09	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	23.6	MG/KG	3.7	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.21	MG/KG	0.18	1.0
		Chromium, Total	0.18 u	MG/KG	0.18	1.0
		Copper, Total	0.30	MG/KG	0.18	1.0
		Iron, Total	95.1	MG/KG	4.1	1.0
		Mercury, Total	0.008u J	MG/KG	0.008	1.0
		Potassium, Total	22.8	MG/KG	3.7	1.0
		Magnesium, Total	8.8	MG/KG	2.3	1.0
		Manganese, Total	3.6	MG/KG	0.04	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	12.7	MG/KG	1.8	1.0
		Nickel, Total	0.18 u	MG/KG	0.18	1.0
		Lead, Total	0.48 UJ	MG/KG	0.28	1.0
		Antimony, Total	0.28 u	MG/KG	0.28	1.0
		Selenium, Total	0.55 u	MG/KG	0.55	1.0
		Silicon, Total	64.3	MG/KG	3.7	1.0
		Vanadium, Total	0.18	MG/KG	0.13	1.0
		Zinc, Total	1.9	MG/KG	0.55	1.0

3/4/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/28/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J16355	Silver, TCLP Leachate	1.0 u J	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	19.8 UJ	UG/L	5.0	1.0
		Barium, TCLP Leachate	278	UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50 u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.0 u	UG/L	2.0	1.0
		Mercury, TCLP Leachate	0.06 u	UG/L	0.06	1.0
		Lead, TCLP Leachate	3.0 u	UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0 u	UG/L	6.0	1.0
-005	J16356	Silver, TCLP Leachate	1.0 u J	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	12.4 UJ	UG/L	5.0	1.0
		Barium, TCLP Leachate	249	UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50 u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.0 u	UG/L	2.0	1.0
		Mercury, TCLP Leachate	0.06 u	UG/L	0.06	1.0
		Lead, TCLP Leachate	3.0 u	UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0 u	UG/L	6.0	1.0
-006	J16357	Silver, TCLP Leachate	1.0 u J	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	26.9 UJ	UG/L	5.0	1.0
		Barium, TCLP Leachate	62.0	UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50 u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.6	UG/L	2.0	1.0
		Mercury, TCLP Leachate	0.06 u	UG/L	0.06	1.0
		Lead, TCLP Leachate	3.0 u	UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0	UG/L	6.0	1.0

2/20/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0801L380
SDG/SAF#: H1037/RC-029

W.O.#: 11343-606-001-9999-00
Date Relogged: 01-02-08

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 3 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Samples J16355 and J16356 were reported with 3-fold dilutions for ICP metals due to sample matrix.

3. All analyses were performed within the required holding times.

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of various CCV's for Iron (2714 line), Potassium, and Sodium, and the ending CCV for Antimony in file TA0109B. All Antimony results contained in this report are surrounded by QC within control. Iron was reported from the Iron 2714 line for sample J16356 and the PDS and may be baised slightly high. The CCV's for Potassium associated with the sample results were 111.0%, 111.3%, 121.5%. The CCV's for Sodium associated with the sample results were 113.7%, 116.8%, and 127.2%. Sample results for Potassium and Sodium may be biased slightly high.

5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The MB result for Sodium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.

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sample results were reported herein "uncorrected" for the levels found in the MB.

7. All ICP Interference Check Standards were within control limits.

8. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

9. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J16332	Aluminum	66,000	109.0
	Iron	66,000	125.6
	Manganese	3,000	98.7
	Antimony	300	92.6
	Silicon	6,000	104.2

11. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

1/11/08
Date

jjw/m01-389

LIONVILLE LABORATORY INC.

RECEIVED
JAN 2008

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1037

DATE RECEIVED: 01/02/08 LVL LOT # :0801L380

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16355						
SILVER, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
SILVER, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
SILVER, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
ALUMINUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
ALUMINUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
ALUMINUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
ARSENIC, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
ARSENIC, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
ARSENIC, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
BORON, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
BORON, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
BORON, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
BARIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
BARIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
BARIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
BERYLLIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
BERYLLIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
BERYLLIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
CALCIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
CALCIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
CALCIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
CADMIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
CADMIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
CADMIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
COBALT, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
COBALT, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
COBALT, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
CHROMIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
CHROMIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
CHROMIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
COPPER, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
COPPER, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
COPPER, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
IRON, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
IRON, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1037

DATE RECEIVED: 01/02/08 LVL LOT # :0801L380

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
MERCURY, TOTAL	001	S	08C0001	11/29/07	01/02/08	01/03/08
MERCURY, TOTAL	001 REP	S	08C0001	11/29/07	01/02/08	01/03/08
MERCURY, TOTAL	001 MS	S	08C0001	11/29/07	01/02/08	01/03/08
POTASSIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
POTASSIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
POTASSIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
MAGNESIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
MAGNESIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
MAGNESIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
MANGANESE, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
MANGANESE, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
MANGANESE, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
MOLYBDENUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
MOLYBDENUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
MOLYBDENUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
SODIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
SODIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
SODIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
NICKEL, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
NICKEL, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
NICKEL, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
LEAD, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
LEAD, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
LEAD, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
ANTIMONY, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
ANTIMONY, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
ANTIMONY, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
SELENIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
SELENIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
SELENIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
SILICON, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
SILICON, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
SILICON, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
VANADIUM, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08
VANADIUM, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
VANADIUM, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
ZINC, TOTAL	001	S	08L0004	11/29/07	01/03/08	01/09/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1037

DATE RECEIVED: 01/02/08 LVL LOT # :0801L380

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 REP	S	08L0004	11/29/07	01/03/08	01/09/08
ZINC, TOTAL	001 MS	S	08L0004	11/29/07	01/03/08	01/09/08
J16356						
SILVER, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
ALUMINUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
ARSENIC, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
BORON, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
BARIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
BERYLLIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
CALCIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
CADMIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
COBALT, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
CHROMIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
COPPER, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
IRON, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
MERCURY, TOTAL	002	S	08C0001	11/29/07	01/02/08	01/03/08
POTASSIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
MAGNESIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
MANGANESE, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
MOLYBDENUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
SODIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
NICKEL, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
LEAD, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
ANTIMONY, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
SELENIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
SILICON, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
VANADIUM, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
ZINC, TOTAL	002	S	08L0004	11/29/07	01/03/08	01/09/08
J16357						
SILVER, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
ALUMINUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
ARSENIC, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
BORON, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
BARIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1037

DATE RECEIVED: 01/02/08 LVL LOT # :0801L380

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BERYLLIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
CALCIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
CADMIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
COBALT, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
CHROMIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
COPPER, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
IRON, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
MERCURY, TOTAL	003	S	08C0001	11/29/07	01/02/08	01/03/08
POTASSIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
MAGNESIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
MANGANESE, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
MOLYBDENUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
SODIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
NICKEL, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
LEAD, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
ANTIMONY, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
SELENIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
SILICON, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
VANADIUM, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08
ZINC, TOTAL	003	S	08L0004	11/29/07	01/03/08	01/09/08

LAB QC:

SILVER LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
SILVER, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
ALUMINUM LABORTORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
ALUMINUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
ARSENIC LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
ARSENIC, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
BORON LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
BORON, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
BARIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
BARIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
BERYLLIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
BERYLLIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
CALCIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
CALCIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
CADMIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1037

DATE RECEIVED: 01/02/08 LVL LOT # :0801L380

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CADMIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
COBALT LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
COBALT, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
CHROMIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
CHROMIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
COPPER LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
COPPER, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
IRON LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
IRON, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
MERCURY LABORATORY	LC1 BS	S	08C0001	N/A	01/02/08	01/03/08
MERCURY, TOTAL	MB1	S	08C0001	N/A	01/02/08	01/03/08
POTASSIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
POTASSIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
MAGNESIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
MAGNESIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
MANGANESE LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
MANGANESE, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
MOLYBDENUM LABORATOR	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
MOLYBDENUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
SODIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
SODIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
NICKEL LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
NICKEL, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
LEAD LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
LEAD, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
ANTIMONY LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
ANTIMONY, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
SELENIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
SELENIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
SILICON LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
SILICON, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
VANADIUM LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
VANADIUM, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08
ZINC LABORATORY	LC1 BS	S	08L0004	N/A	01/03/08	01/09/08
ZINC, TOTAL	MB1	S	08L0004	N/A	01/03/08	01/09/08

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0712L264
SDG/SAF#: K1037/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 12-04-07

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analysis of 3 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

6. All preparation/method blanks (MB) were within method criteria, {MB value less than 5% of the RCRA limit }. Refer to the Inorganics Method Blank Data Summary.

7. All ICP Interference Check Standards were within control limits.

8. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

9. The TCLP extract from sample J16355 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

10. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 17 pages.

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11. For the purposes of this report, the data has been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

12. LvLI is NELAP accredited by the state of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

12/28/07

Date

for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

tlb/m12-264

LvLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-031 | Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-46		SAF No.: RC-029
Ice Chest No.: ERC-02-006	Field Logbook No.: EL-1601	COA: C00F46A000	Method of Shipment: FedEx
Shipped To: BH 11/29/07 ~~EBERLINE SERVICES~~ / JONVILLE	Offsite Property No.: A080060		Bill of Lading/Air Bill No.: 2L 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	P	G/P	G	G/P	aG	aG	G				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; ~~Pesticides - 8081~~	PAHs - 8310	TPH (Total) - 418.1				

BH 11/29/07

JY 12-3-07

samples from 3728 Ref # 2C.
3728 Custodian removed samples for shipping on 12/3/07.
Sampler unavailable to relinquish

Sample No.	Matrix *	Sample Date	Sample Time										
J16355	SOIL	11/29/07	1305			X	X	X	X	X			
J16356	SOIL	11/29/07	1310			X	X	X	X	X			
J16357	SOIL	11/29/07	1300			X							
~~J16358~~	~~SOIL~~												
~~J16359~~	~~SOIL~~	BH 11/29/07											

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
B Welch-Koelling	11/29/07 1340	BHudson	11/29/07 1340
BHudson	11/29/07 1530	3728 # 2C	11/29/07 1530
3728 # 2C	12-3-07 0900	KM Singleton	12-3-07 0900
KM Singleton	12-3-07 1500	FED EX	
FED EX	12-4-07 0930		12-4-07 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

000000016

000024

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-46		DATA PACKAGE:	K1037	
VALIDATOR:	ELR	LAB: LLI		DATE: 2/19/08	
			SDG: K1037		

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	TCLP 1311/6010	

SAMPLES/MATRIX
J16355 J16356 J16357
J16355-T J16356-T J16357-T ← TCLP analysis
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: arsenic SS-T, S6-T, S7-T UJ
lead - S7 - UJ

S7-T barium chromium selenium
S7 - al, barium, calcium, cobalt, copper, Fe, potassium, magnesium, manganese, sodium, ~~lead~~, silicon, vanadium + zinc

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: silver -J SS-T, S6-T, S7-T no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: ~~Arsenic 46% J RSS-T SC-T 3/19/07~~

Silicon - 34% - FD (SS/SC)

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments:

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

Hg - <2X 55, 54+57 - J

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?..... Yes No N/A

Results supported in the raw data? (Levels D, E)..... Yes No N/A

Samples properly prepared? (Levels D, E)..... Yes No N/A

Detection limits meet RDL?..... Yes No N/A

Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/10/08

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0004-MB1	Silver, Total	0.10	u	MG/KG	0.10	1.0
		Aluminum, Total	4.0	u	MG/KG	4.0	1.0
		Arsenic, Total	0.50	u	MG/KG	0.50	1.0
		Boron, Total	0.50	u	MG/KG	0.50	1.0
		Barium, Total	0.33		MG/KG	0.10	1.0
		Beryllium, Total	0.05	u	MG/KG	0.05	1.0
		Calcium, Total	14.4		MG/KG	4.0	1.0
		Cadmium, Total	0.05	u	MG/KG	0.05	1.0
		Cobalt, Total	0.20	u	MG/KG	0.20	1.0
		Chromium, Total	0.20	u	MG/KG	0.20	1.0
		Copper, Total	0.20	u	MG/KG	0.20	1.0
		Iron, Total	5.7		MG/KG	4.5	1.0
		Potassium, Total	4.0	u	MG/KG	4.0	1.0
		Magnesium, Total	4.6		MG/KG	2.5	1.0
		Manganese, Total	0.04	u	MG/KG	0.04	1.0
		Molybdenum, Total	0.30	u	MG/KG	0.30	1.0
		Sodium, Total	17.6		MG/KG	2.0	1.0
		Nickel, Total	0.20	u	MG/KG	0.20	1.0
		Lead, Total	0.83		MG/KG	0.30	1.0
		Antimony, Total	0.30	u	MG/KG	0.30	1.0
		Selenium, Total	0.60	u	MG/KG	0.60	1.0
		Silicon, Total	4.0	u	MG/KG	4.0	1.0
		Vanadium, Total	0.14	u	MG/KG	0.14	1.0
		Zinc, Total	0.60	u	MG/KG	0.60	1.0
BLANK1	08C0001-MB1	Mercury, Total	0.01	u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J16355	Silver, Total	4.8	0.28u	4.7	102.1	3.0
		Aluminum, Total	6260	5420	187	446.7*	3.0
		Arsenic, Total	169	1.6	187	89.4	3.0
		Boron, Total	89.9	3.5	93.7	92.2	3.0
		Barium, Total	223	52.6	187	91.0	3.0
		Beryllium, Total	4.8	0.51	4.7	91.2	3.0
		Calcium, Total	8750	6240	2340	107.2	3.0
		Cadmium, Total	4.3	0.14u	4.7	91.5	3.0
		Cobalt, Total	50.4	4.9	46.8	97.2	3.0
		Chromium, Total	25.6	7.7	18.7	95.7	3.0
		Copper, Total	32.9	11.7	23.4	90.6	3.0
		Iron, Total	14800	13000	93.7	1924 *	3.0
		Mercury, Total	0.19	0.01u	0.17	108.1	1.0
		Potassium, Total	3540	844	2340	115.2	3.0
		Magnesium, Total	6280	3810	2340	105.2	3.0
		Manganese, Total	280	221	46.8	127.4*	3.0
		Molybdenum, Total	86.1	0.84u	93.7	91.9	3.0
		Sodium, Total	3040	211	2340	120.7	3.0
		Nickel, Total	53.6	8.7	46.8	95.9	3.0
		Lead, Total	51.2	5.2	46.8	98.3	3.0
		Antimony, Total	35.8	1.2	46.8	73.9	3.0
		Selenium, Total	155	1.7 u	187	82.7	3.0
		Silicon, Total	2620	2470	93.7	156.5*	3.0
		Vanadium, Total	76.5	30.0	46.8	99.4	3.0
		Zinc, Total	70.9	28.4	46.8	90.8	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037

LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J16355	Silver, Total	0.28u	0.40	~~NC~~ 200	3.0
		Aluminum, Total	5420	5860	7.9	3.0
		Arsenic, Total	1.6	1.8	11.8	3.0
		Boron, Total	3.5	3.7	5.6	3.0
		Barium, Total	52.6	59.8	12.8	3.0
		Beryllium, Total	0.51	0.48	6.8	3.0
		Calcium, Total	6240	6340	1.7	3.0
		Cadmium, Total	0.14u	0.14u	NC	3.0
		Cobalt, Total	4.9	5.5	11.5	3.0
		Chromium, Total	7.7	8.2	6.3	3.0
		Copper, Total	11.7	11.3	3.5	3.0
		Iron, Total	13000	14300	9.8	3.0
		Mercury, Total	0.01u	0.00u	NC	1.0
		Potassium, Total	844	914	7.9	3.0
		Magnesium, Total	3810	3950	3.5	3.0
		Manganese, Total	221	229	3.6	3.0
		Molybdenum, Total	0.84u	0.84u	NC	3.0
		Sodium, Total	211	242	13.7	3.0
		Nickel, Total	8.7	9.0	3.4	3.0
		Lead, Total	5.2	5.1	1.9	3.0
		Antimony, Total	1.2	1.4	15.4	3.0
		Selenium, Total	1.7 u	1.7 u	NC	3.0
		Silicon, Total	2470	2450	0.67	3.0
		Vanadium, Total	30.0	32.1	6.8	3.0
		Zinc, Total	28.4	27.7	2.5	3.0

corrected value
MW 1/10/08

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/10/08

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0801L380

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0004-LC1	Silver, LCS	46.0	50.0	MG/KG	92.0
		Aluminum, LCS	504	500	MG/KG	100.8
		Arsenic, LCS	872	1000	MG/KG	87.2
		Boron, LCS	440	500	MG/KG	88.0
		Barium, LCS	455	500	MG/KG	91.0
		Beryllium, LCS	22.9	25.0	MG/KG	91.6
		Calcium, LCS	2410	2500	MG/KG	96.3
		Cadmium, LCS	23.4	25.0	MG/KG	93.6
		Cobalt, LCS	244	250	MG/KG	97.7
		Chromium, LCS	47.8	50.0	MG/KG	95.6
		Copper, LCS	112	125	MG/KG	89.2
		Iron, LCS	510	500	MG/KG	102.1
		Potassium, LCS	2730	2500	MG/KG	109.1
		Magnesium, LCS	2480	2500	MG/KG	99.3
		Manganese, LCS	69.8	75.0	MG/KG	93.1
		Molybdenum, LCS	469	500	MG/KG	93.8
		Sodium, LCS	2940	2500	MG/KG	117.8
		Nickel, LCS	189	200	MG/KG	94.7
		Lead, LCS	233	250	MG/KG	93.3
		Antimony, LCS	259	300	MG/KG	86.3
		Selenium, LCS	867	1000	MG/KG	86.7
		Silicon, LCS	471	500	MG/KG	94.2
		Vanadium, LCS	245	250	MG/KG	98.2
		Zinc, LCS	90.5	100	MG/KG	90.5
LCS1	08C0001-LC1	Mercury, LCS	4.8	4.7	MG/KG	101.6

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/28/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	07L0633-MB1	Silver, TCLP Leachate	1.0	u	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	11.5		UG/L	5.0	1.0
		Barium, TCLP Leachate	1.0	u	UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50	u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.0	u	UG/L	2.0	1.0
		Lead, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0	u	UG/L	6.0	1.0
BLANK2	07L0633-MB2	Silver, TCLP Leachate	1.0	u	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	18.5		UG/L	5.0	1.0
		Barium, TCLP Leachate	4.7		UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50	u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.0	u	UG/L	2.0	1.0
		Lead, TCLP Leachate	3.0	u	UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0	u	UG/L	6.0	1.0
BLANK1	07C0225-MB1	Mercury, Total	0.06	u	UG/L	0.06	1.0
BLANK2	07C0225-MB2	Mercury, TCLP Leachate	0.06	u	UG/L	0.06	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/28/07

CLIENT: TNUHANFORD RC-029 K1037

LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J16355	Silver, TCLP Leachate	3250	1.0 u	5000 ~~50.0~~	~~5[illegible]5~~ 65.0	1.0
		Arsenic, TCLP Leachate	4850	19.8	5000 ~~2000~~	~~241.4~~ 96.6	1.0
		Barium, TCLP Leachate	104000	278	2000	~~5276~~ 103.7	2.0
		Cadmium, TCLP Leachate	965	0.50u	~~50.0~~	~~1910~~ 96.5	1.0
		Chromium, TCLP Leachat	4660	2.0 u	5000 ~~200~~	~~2330~~ 93.2	1.0
		Mercury, TCLP Leachate	178	0.06u	200 ~~200~~	89.0	50.0
		Lead, TCLP Leachate	4690	3.0 u	5000 ~~500~~	~~9[illegible]42~~ 93.8	1.0
		Selenium, TCLP Leachat	985	6.0 u	2000 ~~2000~~	~~49.2~~ 98.5	1.0

* Corrected values
TEM 12/28/07

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/28/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	J16355	Silver, TCLP Leachate	1.0 u	1.7	NC	1.0
		Arsenic, TCLP Leachate	19.8	12.3	46.7	1.0
		Barium, TCLP Leachate	278	258	7.3	1.0
		Cadmium, TCLP Leachate	0.50u	0.50u	NC	1.0
		Chromium, TCLP Leachate	2.0 u	3.4	NC	1.0
		Mercury, TCLP Leachate	0.06u	0.06u	NC	1.0
		Lead, TCLP Leachate	3.0 u	3.0 u	NC	1.0
		Selenium, TCLP Leachate	6.0 u	6.0 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/28/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	07L0633-LC1	Silver, LCS	480	500	UG/L	96.0
		Arsenic, LCS	9660	10000	UG/L	96.6
		Barium, LCS	4970	5000	UG/L	99.4
		Cadmium, LCS	241	250	UG/L	96.4
		Chromium, LCS	498	500	UG/L	99.6
		Lead, LCS	2480	2500	UG/L	99.1
		Selenium, LCS	9600	10000	UG/L	96.0
LCS1	07C0225-LC1	Mercury, LCS	4.9	5.0	UG/L	97.5

Date: 21 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Site 100-F-46
Subject: PCB/Polyaromatic Hydrocarbons - Data Package No. K1037-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1037 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16355	11/29/07	Soil	C	See note 1
J16356	11/29/07	Soil	C	See note 1

1 – PCBs by 8082 & polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to LCS (142%) and MSD (141%) recoveries outside QC limits, all benzo(a)pyrene results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J16355/J16356) were submitted for analysis. Field duplicates are compared using the same criteria as for field duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All naphthalene, acenaphthylene and acenaphthene results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data Package No. K1037 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to LCS (142%) and MSD (141%) recoveries outside QC limits, all benzo(a)pyrene results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All naphthalene, acenaphthylene and acenaphthene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB/PAH DATA QUALIFICATION SUMMARY*

SDG: K1037	REVIEWER: ELR	Project: 100-F-46	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Benzo(a)pyrene	J	All	LCS & MSD recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 12/06/07 14:21

RFW Batch Number: 0712L264 Client: TNU-HANFORD RC-029 Work Order: 11343606001 Page: 1

	Cust ID:	J16355	J16355	J16355	J16356	PBLKJZ	PBLKJZ BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	07LE0675-MB1	07LE0675-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	78 %	86 %	82 %	82 %	78 %	98 %
	Decachlorobiphenyl	70 %	77 %	74 %	72 %	72 %	85 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		14 U	81 %	78 %	14 U	13 U	89 %
Aroclor-1221		14 U	14 U	14 U	14 U	13 U	13 U
Aroclor-1232		14 U	14 U	14 U	14 U	13 U	13 U
Aroclor-1242		14 U	14 U	14 U	14 U	13 U	13 U
Aroclor-1248		14 U	14 U	14 U	14 U	13 U	13 U
Aroclor-1254		14 U	14 U	14 U	14 U	13 U	13 U
Aroclor-1260		14 U	90 %	87 %	4.8 J	13 U	99 %

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2/20/08

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.

PAH'S by HPLC / Method 8310

Report Date: 12/06/07 13:51

RFW Batch Number: 0712L264 Client: TNU-HANFORD RC-029 Work Order: 11343606001 Page: 1

	Cust ID:	J16355	J16355	J16355	J16356	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	07LE0673-MB1	07LE0673-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Triphenylene		122 %	121 %	130 %	122 %	126 %	129 %
		fl	fl	fl	fl	fl	fl
Naphthalene		35.6 U	120 %	116 %	35.5 U	33.3 U	129 %
Acenaphthylene		35.6 U	134 * %	119 %	35.5 U	33.3 U	131 %
Acenaphthene		35.6 U	109 %	116 %	35.5 U	33.3 U	124 %
Fluorene		3.56 U	117 %	121 %	3.55 U	3.33 U	125 %
Phenathrene		3.56 U	119 %	121 %	3.55 U	3.33 U	124 %
Anthracene		3.56 U	124 %	125 %	3.55 U	3.33 U	130 %
Fluoranthrene		3.56 U	129 %	145 * %	3.55 U	3.33 U	128 %
Indeno (1,2,3-cd) pyrene		10	124 %	130 %	3.55 U	3.33 U	124 %
Pyrene		3.56 U	113 %	127 %	3.55 U	3.33 U	124 %
Benzo (a) anthracene		3.3 J	115 %	129 %	3.9	3.33 U	126 %
Chrysene		3.56 U	101 %	136 %	3.55 U	3.33 U	131 %
Benzo (b) fluoranthrene		3.0 J	119 %	122 %	1.3 J	3.33 U	131 %
Benzo (k) fluoranthrene		1.6 J	126 %	127 %	7.6	3.33 U	135 %
Benzo (a) pyrene		2.9 ~~J~~ J	130 %	141 * %	1.5 ~~J~~ J	3.33 U	142 * %
Dibenzo (a,h) anthracene		3.56 U	122 %	120 %	3.55 U	3.33 U	133 %
Benzo (ghi) perylene		3.56 U	117 %	115 %	4.2	3.33 U	129 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

2/20/08

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0712L264
SDG/SAF # K1037 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 12-04-2007

PCB

Two (2) soil samples were collected on 11-29-2007.

The samples and their associated QC samples were extracted on 12-04-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 12-06-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

10. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Carol Schenkel
for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/12/07
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0712L264
SDG/SAF # K1037 /RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 12-04-2007

POLYAROMATIC HYDROCARBONS

Two (2) soil samples were collected on 11-29-2007.

The samples and their associated QC samples were extracted on 12-04-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 12-05-2007. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8310.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. All required holding times for extraction and analysis have been met.
2. The method blank was below the reporting limits for all target compounds.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. One (1) of sixteen (16) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
5. Three (3) of thirty-two (32) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The initial calibrations associated with this data set were within acceptance criteria.
7. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
8. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

Ian Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/12/07
Date

r:\group\data\2007\8310\tnu\0712-264ks2.8310.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

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Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 076C302

Initiator: CAL
Date: 12-06-07
Client: TNU

Batch: 07L264
Samples: CC/MS/MSD BS
Method: SW846/MCAWW/CLP/

Parameter: PAH5
Matrix: SOIL
Prep Batch: 07LE0673

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy
__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

several spikes out high

2. Known or Probable Causes(s)

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description:

None of the compounds with high spikes were detected above the reporting limit in either sample. Narrate

4. Project Manager Instructions...signature/date: [signature] for OT.
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: KAS 12-07-07
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation:

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-031 | Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-46		SAF No.: RC-029
Ice Chest No.: ERC-02-006	Field Logbook No.: EL-1601	COA: C00F46A000	Method of Shipment: FedEx
Shipped To: BH 11/29/07 ~~EBERLINE SERVICES~~ / JONVILLE	Offsite Property No.: A080060		Bill of Lading/Air Bill No.: 2L05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	P	O/P	G	G/P	aG	aG	G			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; ~~Pesticides - 8081~~	PAHs - 8310	TPH (Total) - 418.1			

BH 11/29/07

12-3-07

samples from 3728 Ref # 2C.
3728 Custodian removed samples for shipping on 12/3/07.
Sampler unavailable to relinquish

Sample No.	Matrix *	Sample Date	Sample Time										
J16355	SOIL	11/29/07	1305			X	X	X	X	X			
J16356	SOIL	11/29/07	1310			X	X	X	X	X			
J16357	SOIL	11/29/07	1300			X							
~~J16358~~	~~SOIL~~												
~~J16359~~	~~SOIL~~	BH 11/29/07											

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	BHUDSON	11/29/07 1340	BHUDSON	11/29/07 1340
Relinquished By/Removed From	BHUDSON	11/29/07 1530	3728# 2C	11/29/07 1530
Relinquished By/Removed From	3728 # 2C	12-3-07 0900	KM Singleton	12-3-07 0900
Relinquished By/Removed From	KM Singleton	12-3-07 1500 WCH	FED EX	
Relinquished By/Removed From	FED EX	12-4-07 0930		12-4-07 0930
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

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Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-46			DATA PACKAGE: K1037		
VALIDATOR: ELR		LAB: LLI		DATE: 2/18/08	
			SDG: K1037		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)	8310	
SAMPLES/MATRIX					
J16355 J16356					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A

Surrogate recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: benzo(c)pgrene - MS + LCS - J all

no PS

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: 3 PAH one

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries acceptable? ..... Yes No N/A

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries acceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 21 February 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-46
Subject: Wet Chemistry - Data Package No. K1037-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1037 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analyte
J16355	11/29/07	Soil	C	See note 1
J16356	11/29/07	Soil	C	See note 1

1 – Chromium VI by 7196A and petroleum hydrocarbons by 9071/418.1.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI and 14 days for petroleum hydrocarbons.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than

or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J16355/J16356) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All petroleum hydrocarbon results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package K1037 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All petroleum hydrocarbon results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

Fluor Hanford Data Validation Contract #29776 (June 2006), *Validation Statement of Work*, through Washington Closure Hanford Work Order #WB6081.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1037	REVIEWER: ELR	Project: 100-F-46	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16355	% Solids	93.6		%	0.01	1.0
		Chromium VI	0.21	u	MG/KG	0.21	1.0
		Petroleum Hydrocarbons	142	u	MG/KG	142	1.0
-002	J16356	% Solids	93.8		%	0.01	1.0
		Chromium VI	0.28		MG/KG	0.21	1.0
		Petroleum Hydrocarbons	141	u	MG/KG	141	1.0
-003	J26357	% Solids	100		%	0.01	1.0

2/20/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029 K1073
LVL#: 0712L264

W.O.#: 11343-606-001-9999-00
Date Received: 12-04-07

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI and Petroleum Hydrocarbons (PHC) were within the 75-125% control limits.

8. The replicate analyses for Percent Solids and PHC were within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the control limit that may beattributed to sample inhomogeneity.

9. Results for soil samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Brian Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/17/07
Date

njp\i12-264

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-031 | Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-46		SAF No.: RC-029
Ice Chest No.: EAC-02-006	Field Logbook No.: EL-1601	COA: C00F46A000	Method of Shipment: FedEx
Shipped To: BH 11/29/07 ~~EDC LINE SERVICES~~ / JONVILLE	Offsite Property No.: A080060		Bill of Lading/Air Bill No.: 2L05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	P	G/P	G	G/P	aG	aG	G				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; ~~Pesticides - 8081~~	PAHs - 8310	TPH (Total) - 418.1 samples from 3728 Ref # 2C. 3728 Custodian removed samples for shipping on 12/3/07. Sampler unavailable to relinquish				

Sample No.	Matrix *	Sample Date	Sample Time										
J16355	SOIL	11/29/07	1305			X	X	X	X	X			
J16356	SOIL	11/29/07	1310			X	X	X	X	X			
J16357	SOIL	11/29/07	1300			X							
~~J16358~~	~~SOIL~~												
~~J16359~~	~~SOIL~~ BH 11/29/07												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Welch-Koelling	11/29/07 1340	BHUDSON	11/29/07 1340
BHUDSON	11/29/07 1530	3728 #2C	11/29/07 1530
3728 #2C	12-3-07 0900	KMSingleton	12-3-07 0900
KMSingleton	12-3-07 1500 WCH	FED EX	
FED EX	12-4-07 0930		12-4-07 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

000012

0100000000

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-46			DATA PACKAGE: K1037		
VALIDATOR: ELR		LAB: LLI		DATE: 2/19/08	
			SDG: K1037		

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX
J16355 J16356
soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A

Spike standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No N/A

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: all petroleum hydrocarbons over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/14/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	07LVI099-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0
BLANK10	07LHC042-MB1	Petroleum Hydrocarbons	133 u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1037

LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J16355	Soluble Chromium VI	4.6	0.21u	4.3	105.6	1.0
		Insoluble Chromium VI	1250	0.21u	1250	99.5	100
-002	J16356	Petroleum Hydrocarbons	594	33.0	595	94.2	1.0
BLANK10	07LVI099-MB1	Soluble Chromium VI	4.1	0.20u	4.0	101.6	1.0
		Insoluble Chromium VI	1070	0.20u	1060	100.8	100
BLANK10	07LHC042-MB1	Petroleum Hydrocarbons	548	133 u	559	98.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1037 LVL LOT #: 0712L264

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J16355	Chromium VI	0.21u	0.24	72.6	1.0
-002REP	J16356	Petroleum Hydrocarbons	141 u	142 u	NC	1.0
-003REP	J26357	% Solids	100	100	0.020	1.0