0077011

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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1034 **SAF-RC-029**

Waste Site: 100-F-52

RECEIVED
MAY 01 2008
EDMC

Date: 14 April 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-52
Subject: Radiochemistry - Data Package No. K1034-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1034 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
J162R4	11/28/07	Soil	C	See note 1
J162R5	11/28/07	Soil	C	See note 1
J162R6	11/28/07	Soil	C	See note 1

1 – Gross alpha/beta, alpha spectroscopy, gamma spectroscopy, carbon-14 and nickel-63.

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 (although the MDA for gross alpha exceeded the RQL).

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 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 (J162R4/J162R5) were submitted for analysis. Field 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. Three analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. K1034 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 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.

Three 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: K1034	REVIEWER: ELR	Project: 100-F-52	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14	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 K1034

7718-001 J162R4

DATA SHEET

SDG	7718	Client/Case no	Hanford	SDG K1034	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711161-01	Client sample id	J162R4		
Dept sample id	7718-001	Location/Matrix	100-F-52	SOLID	
Received	11/30/07	Collected/Weight	11/28/07 10:05	1545 g	
% solids	97.4	Custody/SAF No	RC-029-030	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	7.76	6.9	10.6	10.0	U	93A
Gross Beta	12587-47-2	20.8	4.4	5.61	15.0		93B
Carbon 14	14762-75-5	0.898	1.8	3.05	50.0	U J	C
Nickel 63	13981-37-8	0.925	2.0	3.38	30.0	U	NI_L
Uranium 233/234	U-233/234	0.322	0.28	0.352	1.00	U	U
Uranium 235	15117-96-1	0.056	0.11	0.427	1.00	U	U
Uranium 238	U-238	0.875	0.38	0.352	1.00		U
Potassium 40	13966-00-2	14.5	0.75	0.227			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.100	U	GAM
Radium 226	13982-63-3	0.567	0.055	0.049	0.100		GAM
Radium 228	15262-20-1	0.837	0.11	0.105	0.200		GAM
Europium 152	14683-23-9	U		0.061	0.100	U	GAM
Europium 154	15585-10-1	U		0.074	0.100	U	GAM
Europium 155	14391-16-3	U		0.079	0.100	U	GAM
Thorium 228	14274-82-9	0.725	0.037	0.034			GAM
Thorium 232	TH-232	0.837	0.11	0.105			GAM
Uranium 235	15117-96-1	U		0.107		U	GAM
Uranium 238	U-238	U		3.06		U	GAM
Americium 241	14596-10-2	U		0.151		U	GAM

Remaining Sites Confirmation Samplin

R 4/11/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/17/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1034

7718-002 J162R5

DATA SHEET

SDG	7718	Client/Case no	Hanford	SDG K1034	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711161-02	Client sample id	J162R5		
Dept sample id	7718-002	Location/Matrix	100-F-52	SOLID	
Received	11/30/07	Collected/Weight	11/28/07 10:10	1529 g	
% solids	97.3	Custody/SAF No	RC-029-030	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	15.4	6.9	7.88	10.0		93A
Gross Beta	12587-47-2	14.6	4.0	5.56	15.0		93B
Carbon 14	14762-75-5	1.00	1.8	3.01	50.0	U J	C
Nickel 63	13981-37-8	0.588	2.0	3.44	30.0	U	NI_L
Uranium 233/234	U-233/234	0.407	0.21	0.195	1.00		U
Uranium 235	15117-96-1	0	0.062	0.236	1.00	U	U
Uranium 238	U-238	0.433	0.21	0.195	1.00		U
Potassium 40	13966-00-2	13.8	0.88	0.414			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	0.566	0.077	0.071	0.100		GAM
Radium 228	15262-20-1	0.793	0.18	0.183	0.200		GAM
Europium 152	14683-23-9	U		0.088	0.100	U	GAM
Europium 154	15585-10-1	U		0.137	0.100	U	GAM
Europium 155	14391-16-3	U		0.112	0.100	U	GAM
Thorium 228	14274-82-9	0.900	0.073	0.072			GAM
Thorium 232	TH-232	0.793	0.18	0.183			GAM
Uranium 235	15117-96-1	U		0.167		U	GAM
Uranium 238	U-238	U		4.84		U	GAM
Americium 241	14596-10-2	U		0.301		U	GAM

Remaining Sites Confirmation Samplin

4/11/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/17/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1034

7718-003 J162R6

DATA SHEET

SDG	7718	Client/Case no	Hanford	SDG	K1034
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711161-03	Client sample id	J162R6		
Dept sample id	7718-003	Location/Matrix	100-F-52		SOLID
Received	11/30/07	Collected/Weight	11/28/07 12:35	1487 g	
% solids	96.7	Custody/SAF No	RC-029-030	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	10.0	7.0	9.70	10.0		93A
Gross Beta	12587-47-2	13.8	5.7	8.98	15.0		93B
Carbon 14	14762-75-5	0.700	1.9	3.10	50.0	U J	C
Nickel 63	13981-37-8	1.34	2.1	3.56	30.0	U	NI_L
Uranium 233/234	U-233/234	0.551	0.32	0.301	1.00		U
Uranium 235	15117-96-1	0	0.095	0.365	1.00	U	U
Uranium 238	U-238	0.512	0.32	0.301	1.00		U
Potassium 40	13966-00-2	14.8	0.75	0.330			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.032	0.100	U	GAM
Radium 226	13982-63-3	0.542	0.067	0.061	0.100		GAM
Radium 228	15262-20-1	0.809	0.13	0.125	0.200		GAM
Europium 152	14683-23-9	U		0.082	0.100	U	GAM
Europium 154	15585-10-1	U		0.110	0.100	U	GAM
Europium 155	14391-16-3	U		0.080	0.100	U	GAM
Thorium 228	14274-82-9	0.880	0.046	0.046			GAM
Thorium 232	TH-232	0.809	0.13	0.125			GAM
Uranium 235	15117-96-1	U		0.183		U	GAM
Uranium 238	U-238	U		4.02		U	GAM
Americium 241	14596-10-2	U		0.037		U	GAM

Remaining Sites Confirmation Samplin

R 4/11/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/17/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1034 was composed of three 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 17, 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 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Isotopic Uranium 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."

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

12/17/7

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-030	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-52 K1034 (7718)		SAF No.: RC-029
Ice Chest No.: FRC-96-050	Field Logbook No.: EL-1601	COA: C00F52A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES ~~LIONVILLE~~ BH 11/28/07	Offsite Property No.: A0800R4		Bill of Lading/Air Bill No.: 5221 0SPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	G/P	aG	aG	G	G		
No. of Container(s)	1	1	1	1	1		1	1		
Volume	1000mL	60mL	250mL	120mL	250mL	250mL	60mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; ~~Tritium-H3~~ BH 11/28/07	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		

BH 11/28/07

510001

Sample No.	Matrix *	Sample Date	Sample Time										
~~J162R3~~	~~SOIL~~	BH 11/28/07											
J162R4	SOIL	11/28/07	1005	X	X								
J162R5	SOIL	11/28/07	1010	X	X								
J162R6	SOIL	11/28/07	1235	X	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Tuber Koelling	11/28/07 1430	Received By/Stored In: P Hudson P Hudson	11/28/07 1430
Relinquished By/Removed From: P Hudson P Hudson	11/28/07 1550	Received By/Stored In: 3728 #2C	11/28/07 1550
Relinquished By/Removed From: 3728 #2C	11-29-07 1100	Received By/Stored In: [illegible]	11-29-07 1100
Relinquished By/Removed From: [illegible]	11-29-07 1500	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX		Received By/Stored In: [illegible]	11/30/07 Dep: 30
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~~ BH 11/28/07

(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

samples from 3728 Ref # 2C.
3728 Custodian removed samples for shipping on 11/29/07.
Sampler unavailable to relinquish

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

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-52		DATA PACKAGE:	K1034	
VALIDATOR:	ELR	LAB: EB		DATE: 4/9/08	
			SDG: K1034		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	C-14	Ni-63	
SAMPLES/MATRIX					
J162R4	J162R5	J162R6	J162P6		
					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: Gr A >RQL in blank

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: C-14 - NOMS J

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: 3 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1034

7718-005 Method Blank

METHOD BLANK

SDG	7718	Client/Case no	Hanford	SDG K1034	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R711161-05	Client sample id	Method Blank		
Dept sample id	7718-005	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	-3.55	4.7	11.5	10.0	U	93A
Gross Beta	12587-47-2	0.525	5.3	8.90	15.0	U	93B
Carbon 14	14762-75-5	0.664	2.2	3.76	50.0	U	C
Nickel 63	13981-37-8	0.528	1.8	3.09	30.0	U	NI_L
Uranium 233/234	U-233/234	0.047	0.094	0.361	1.00	U	U
Uranium 235	15117-96-1	0	0.11	0.437	1.00	U	U
Uranium 238	U-238	0	0.094	0.361	1.00	U	U
Potassium 40	13966-00-2	U		0.364		U	GAM
Cobalt 60	10198-40-0	U		0.014	0.050	U	GAM
Cesium 137	10045-97-3	U		0.015	0.100	U	GAM
Radium 226	13982-63-3	U		0.032	0.100	U	GAM
Radium 228	15262-20-1	U		0.063	0.200	U	GAM
Europium 152	14683-23-9	U		0.039	0.100	U	GAM
Europium 154	15585-10-1	U		0.036	0.100	U	GAM
Europium 155	14391-16-3	U		0.042	0.100	U	GAM
Thorium 228	14274-82-9	U		0.023		U	GAM
Thorium 232	TH-232	U		0.063		U	GAM
Uranium 235	15117-96-1	U		0.061		U	GAM
Uranium 238	U-238	U		1.51		U	GAM
Americium 241	14596-10-2	U		0.078		U	GAM

Remaining Sites Confirmation Samplin

QC-BLANK #63922

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/17/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1034

7718-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7718

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1034

Contract No. 630

Lab sample id R711161-04

Dept sample id 7718-004

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	126	21	10.3	10.0		93A	111	4.4	114	55-145	70-130
Gross Beta	112	9.1	6.28	15.0		93B	113	4.5	99	74-126	80-120
Carbon 14	1370	14	3.91	50.0		C	1600	64	86	86-114	80-120
Nickel 63	258	6.3	3.09	30.0		NI_L	266	11	97	84-116	80-120
Uranium 233/234	21.0	2.3	0.993	1.00		U	19.3	0.77	109	79-121	80-120
Uranium 235	16.9	2.0	0.236	1.00		U	15.7	0.63	108	78-122	80-120
Uranium 238	21.9	2.4	0.954	1.00		U	21.0	0.84	104	80-120	80-120
Cobalt 60	0.729	0.047	0.021	0.050		GAM	0.704	0.028	104	74-126	80-120
Cesium 137	0.795	0.042	0.027	0.100		GAM	0.744	0.030	107	74-126	80-120

Remaining Sites Confirmation Samplin

QC-LCS #63921

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 12/17/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1034

7718-006 J162R4

DUPLICATE

SDG	7718			Client/Case no	Hanford SDG K1034
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R711161-06	Lab sample id	R711161-01	Client sample id	J162R4
Dept sample id	7718-006	Dept sample id	7718-001	Location/Matrix	100-F-52 SOLID
		Received	11/30/07	Collected/Weight	11/28/07 10:05 1545 g
% solids	97.4	% solids	97.4	Custody/SAF No	RC-029-030 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	19.5	9.1	9.89	10.0		93A	7.76	6.9	10.6	U	86	134	1.9
Gross Beta	23.0	5.7	7.12	15.0		93B	20.8	4.4	5.61		10	59	0.5
Carbon 14	1.12	1.8	3.01	50.0	U	C	0.898	1.8	3.05	U	-		0.2
Nickel 63	0.118	2.0	3.46	30.0	U	NI_L	0.925	2.0	3.38	U	-		0.6
Uranium 233/234	0.742	0.40	0.378	1.00		U	0.322	0.28	0.352	U	79	138	1.7
Uranium 235	0	0.12	0.458	1.00	U	U	0.056	0.11	0.427	U	-		0.7
Uranium 238	0.643	0.40	0.378	1.00		U	0.875	0.38	0.352		31	110	0.8
Potassium 40	14.6	0.83	0.334			GAM	14.5	0.75	0.227		1	34	0.1
Cobalt 60	U		0.039	0.050	U	GAM	U		0.024	U	-		0.6
Cesium 137	U		0.032	0.100	U	GAM	U		0.024	U	-		0.4
Radium 226	0.598	0.074	0.070	0.100		GAM	0.567	0.055	0.049		5	40	0.4
Radium 228	0.775	0.16	0.163	0.200		GAM	0.837	0.11	0.105		8	48	0.5
Europium 152	U		0.090	0.100	U	GAM	U		0.061	U	-		0.5
Europium 154	U		0.132	0.100	U	GAM	U		0.074	U	-		0.8
Europium 155	U		0.111	0.100	U	GAM	U		0.079	U	-		0.5
Thorium 228	0.714	0.049	0.051			GAM	0.725	0.037	0.034		2	34	0.1
Thorium 232	0.775	0.16	0.163			GAM	0.837	0.11	0.105		8	48	0.5
Uranium 235	U		0.158		U	GAM	U		0.107	U	-		0.5
Uranium 238	U		4.75		U	GAM	U		3.06	U	-		0.6
Americium 241	U		0.288		U	GAM	U		0.151	U	-		0.8

Remaining Sites Confirmation Samplin

QC-DUP#1 63923

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/17/07

Date: 14 April 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Site 100-F-52
Subject: Semivolatile - Data Package No. K1034-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1034 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
J162R4	11/28/07	Soil	C	See note 1
J162R5	11/28/07	Soil	C	See note 1
J162R6	11/28/07	Soil	C	See note 1
J162P6	11/28/07	Soil	C	See note 1

1 – Semivolatiles by 8270C.

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**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 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, 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 met.

- **Method Blanks**

Method blank analyses are conducted 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. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, all detected bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

One field blank (J162P6) was submitted for analysis. Di-n-butylphthalate was detected in the field blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J".

Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike and/or matrix spike duplicate results outside QC limits, all 2,4-dinitrophenol (19%) and 4,6-dinitro-2-methylphenol (30% & 33%) results were qualified as estimates and flagged "J".

Due to LCS results outside QC limits, all bis(2-chloroethyl)ether (47%), 2,2'-oxybis(1-chloropropane), 4-chloroanaline (43%), 2,4-dinitrophenol (19%), 4,6-dinitro-2-methylphenol (24%) and pentachlorophenol (24%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-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.

Due to an RPD outside QC limits, all 4-chloroanaline (35%) and dibenz(a,h)anthrene (30.7%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J162R4/J162R5) were submitted for analysis. Field 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 (RQL's) to ensure that laboratory detection levels meet the required criteria. Thirty-two semivolatile analytes exceeded the RQL. Under the WCH statement of work, no qualification is required. All other undetected analytes met the RQL.

- **Completeness**

Data package No. K1034 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 method blank contamination, all detected bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".
- Due to matrix spike and/or matrix spike duplicate results outside QC limits, all 2,4-dinitrophenol (19%) and 4,6-dinitro-2-methylphenol (30% & 33%) results were qualified as estimates and flagged "J".

- Due to LCS results outside QC limits, all bis(2-chloroethyl)ether (47%), 2,2'-oxybis(1-chloropropane), 4-chloroanaline (43%), 2,4-dinitrophenol (19%), 4,6-dinitro-2-methylphenol (24%) and pentachlorophenol (24%) results were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits, all 4-chloroanaline (35%) and dibenz(a,h)anthrene (30.7%) 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.

Thirty-two semivolatile 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 the data validator in compliance with the 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 same 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 usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K1034	REVIEWER: ELR	Project: 100-F-52	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Method blank contamination
2,4-dinitrophenol 4,6-dinitro-2-methylphenol	J	All	Matrix spike and/or matrix spike duplicate recovery
bis(2-chloroethyl)ether 2,2'-oxybis(1-chloropropane) 4-chloroanaline 2,4-dinitrophenol 4,6-dinitro-2-methylphenol Pentachlorophenol	J	All	LCS recovery
4-chloroanaline Dibenz(a,h)anthrene	J	All	RPD

* - 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

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0711L255 Client: TNUHANFORD RC-029 K1034 Work Order: 11343606001 Report Date: 12/13/07 23:47 Page: 1a

	Cust ID:	J162R4		J162R4		J162R4		J162R5		J162R6		J162P6	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	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 Recovery	Nitrobenzene-d5	69	%	67	%	64	%	61	%	71	%	83	%
	2-Fluorobiphenyl	97	%	110	%	114	%	70	%	82	%	96	%
	Terphenyl-d14	132	%	117	%	112	%	127	%	133	%	131	%
	Phenol-d5	74	%	90	%	81	%	64	%	74	%	90	%
	2-Fluorophenol	89	%	94	%	83	%	63	%	79	%	100	%
	2,4,6-Tribromophenol	48	%	105	%	103	%	89	%	50	%	41	%
			fl		fl		fl		fl		fl		fl
Phenol		340	U	84	%	77	%	340	U	350	U	330	U
bis(2-Chloroethyl)ether		340	U J	61	%	62	%	340	U J	350	U J	330	U J
2-Chlorophenol		340	U	104	%	103	%	340	U	350	U	330	U
1,3-Dichlorobenzene		340	U	67	%	72	%	340	U	350	U	330	U
1,4-Dichlorobenzene		340	U	68	%	73	%	340	U	350	U	330	U
1,2-Dichlorobenzene		340	U	77	%	80	%	340	U	350	U	330	U
2-Methylphenol		340	U	86	%	86	%	340	U	350	U	330	U
2,2'-oxybis(1-Chloropropane)		340	U J	50	%	51	%	340	U J	350	U J	330	U J
3/4 Methylphenol		340	U	83	%	80	%	340	U	350	U	330	U
N-Nitroso-di-n-propylamine		340	U	71	%	68	%	340	U	350	U	330	U
Hexachloroethane		340	U	56	%	56	%	340	U	350	U	330	U
Nitrobenzene		340	U	60	%	66	%	340	U	350	U	330	U
Isophorone		340	U	62	%	65	%	340	U	350	U	330	U
2-Nitrophenol		340	U	69	%	71	%	340	U	350	U	330	U
2,4-Dimethylphenol		340	U	75	%	80	%	340	U	350	U	330	U
bis(2-Chloroethoxy)methane		340	U	63	%	66	%	340	U	350	U	330	U
2,4-Dichlorophenol		340	U	76	%	80	%	340	U	350	U	330	U
1,2,4-Trichlorobenzene		340	U	76	%	77	%	340	U	350	U	330	U
Naphthalene		340	U	82	%	86	%	340	U	350	U	330	U
4-Chloroaniline		340	U J	53	%	37	%	340	U J	350	U J	330	U J
Hexachlorobutadiene		340	U	85	%	87	%	340	U	350	U	330	U
4-Chloro-3-methylphenol		340	U	66	%	65	%	340	U	350	U	330	U
2-Methylnaphthalene		340	U	73	%	76	%	340	U	350	U	330	U
Hexachlorocyclopentadiene		340	U	24	%	25	%	340	U	350	U	330	U
2,4,6-Trichlorophenol		340	U	96	%	107	%	340	U	350	U	330	U
2,4,5-Trichlorophenol		860	U	94	%	103	%	860	U	870	U	830	U

*= Outside of EPA CLP QC limits.

JR 4/11/08

000011

000000008

Cust ID:	J162R4		J162R4		J162R4		J162R5		J162R6		J162P6	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	340	U	99	%	111	%	340	U	350	U	330	U
2-Nitroaniline	860	U	84	%	97	%	860	U	870	U	830	U
Dimethylphthalate	340	U	96	%	115	%	340	U	350	U	330	U
Acenaphthylene	340	U	92	%	105	%	340	U	350	U	330	U
2,6-Dinitrotoluene	340	U	92	%	105	%	340	U	350	U	330	U
3-Nitroaniline	860	U	103	%	101	%	860	U	870	U	830	U
Acenaphthene	340	U	92	%	105	%	340	U	350	U	330	U
2,4-Dinitrophenol	860	UJ	21	%	19 *	%	860	UJ	870	UJ	830	UJ
4-Nitrophenol	860	U	86	%	110	%	860	U	870	U	830	U
Dibenzofuran	340	U	97	%	115	%	340	U	350	U	330	U
2,4-Dinitrotoluene	340	U	94	%	114	%	340	U	350	U	330	U
Diethylphthalate	340	U	94	%	109	%	340	U	350	U	330	U
4-Chlorophenyl-phenylether	340	U	107	%	123 *	%	340	U	350	U	330	U
Fluorene	340	U	93	%	112	%	340	U	350	U	330	U
4-Nitroaniline	860	U	115	%	131 *	%	860	U	870	U	830	U
4,6-Dinitro-2-methylphenol	860	UJ	30 *	%	33 *	%	860	UJ	870	UJ	830	UJ
N-Nitrosodiphenylamine (1)	340	U	86	%	104	%	340	U	350	U	330	U
4-Bromophenyl-phenylether	340	U	103	%	128 *	%	340	U	350	U	330	U
Hexachlorobenzene	340	U	125	%	158 *	%	340	U	350	U	330	U
Pentachlorophenol	860	UJ	55	%	69	%	860	UJ	870	UJ	830	UJ
Phenanthrene	340	U	92	%	111	%	340	U	350	U	330	U
Anthracene	340	U	100	%	127	%	340	U	350	U	330	U
Carbazole	340	U	101	%	126 *	%	340	U	350	U	330	U
Di-n-butylphthalate	31	J	104	%	128	%	340	U	350	U	44	J
Fluoranthene	340	U	95	%	122	%	340	U	350	U	330	U
Pyrene	340	U	88	%	94	%	340	U	350	U	330	U
Butylbenzylphthalate	340	U	91	%	99	%	340	U	350	U	330	U
3,3'-Dichlorobenzidine	340	U	92	%	93	%	340	U	350	U	330	U
Benzo(a)anthracene	340	U	108	%	127	%	340	U	350	U	330	U
Chrysene	340	U	89	%	111	%	340	U	350	U	330	U
bis(2-Ethylhexyl)phthalate	660 ~~200~~ JB U		97	%	115	%	660 ~~100~~ JB U		660 ~~240~~ JB U		660 ~~79~~ JB U	
Di-n-octyl phthalate	340	U	89	%	98	%	340	U	350	U	330	U
Benzo(b)fluoranthene	340	U	75	%	101	%	340	U	350	U	330	U
Benzo(k)fluoranthene	340	U	99	%	114	%	340	U	350	U	330	U
Benzo(a)pyrene	19	J	84	%	102	%	340	U	350	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	78	%	105	%	340	U	350	U	330	U
Dibenz(a,h)anthracene	340	UJ	80	%	109	%	340	UJ	350	UJ	330	UJ
Benzo(g,h,i)perylene	340	U	79	%	103	%	340	U	350	U	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

4/11/08

000000009

000012

	Cust ID:	SBLKQN	SBLKQN BS
Sample Information	RFW#:	07LE0669-MB1	07LE0669-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	ug/Kg	ug/Kg

Surrogate Recovery	Nitrobenzene-d5	65	%	68	%
	2-Fluorobiphenyl	60	%	71	%
	Terphenyl-d14	80	%	79	%
	Phenol-d5	49	%	67	%
	2-Fluorophenol	54	%	67	%
	2,4,6-Tribromophenol	22	%	61	%

Phenol	330	U	59		%
bis(2-Chloroethyl)ether	330	U	47	*	%
2-Chlorophenol	330	U	75		%
1,3-Dichlorobenzene	330	U	59		%
1,4-Dichlorobenzene	330	U	58		%
1,2-Dichlorobenzene	330	U	62		%
2-Methylphenol	330	U	63		%
2,2'-oxybis(1-Chloropropane)	330	U	42	*	%
3/4 Methylphenol	330	U	66		%
N-Nitroso-di-n-propylamine	330	U	52		%
Hexachloroethane	330	U	62		%
Nitrobenzene	330	U	63		%
Isophorone	330	U	64		%
2-Nitrophenol	330	U	75		%
2,4-Dimethylphenol	330	U	66		%
bis(2-Chloroethoxy)methane	330	U	59		%
2,4-Dichlorophenol	330	U	80		%
1,2,4-Trichlorobenzene	330	U	73		%
Naphthalene	330	U	77		%
4-Chloroaniline	330	U	43		%
Hexachlorobutadiene	330	U	87		%
4-Chloro-3-methylphenol	330	U	60		%
2-Methylnaphthalene	330	U	71		%
Hexachlorocyclopentadiene	330	U	50		%
2,4,6-Trichlorophenol	330	U	67		%
2,4,5-Trichlorophenol	830	U	67		%

*= Outside of EPA CLP QC limits.

Cust ID: SBLKQN SBLKQN BS

RFW#: 07LE0669-MB1 07LE0669-MB1

2-Chloronaphthalene	330	U	71	%
2-Nitroaniline	830	U	63	%
Dimethylphthalate	330	U	74	%
Acenaphthylene	330	U	67	%
2,6-Dinitrotoluene	330	U	66	%
3-Nitroaniline	830	U	71	%
Acenaphthene	330	U	70	%
2,4-Dinitrophenol	830	U	19 *	%
4-Nitrophenol	830	U	61	%
Dibenzofuran	330	U	75	%
2,4-Dinitrotoluene	330	U	79	%
Diethylphthalate	330	U	73	%
4-Chlorophenyl-phenylether	330	U	76	%
Fluorene	330	U	72	%
4-Nitroaniline	830	U	89	%
4,6-Dinitro-2-methylphenol	830	U	24 *	%
N-Nitrosodiphenylamine (1)	330	U	61	%
4-Bromophenyl-phenylether	330	U	77	%
Hexachlorobenzene	330	U	104	%
Pentachlorophenol	830	U	45	%
Phenanthrene	330	U	75	%
Anthracene	330	U	80	%
Carbazole	330	U	83	%
Di-n-butylphthalate	330	U	87	%
Fluoranthene	330	U	99	%
Pyrene	330	U	73	%
Butylbenzylphthalate	330	U	74	%
3,3'-Dichlorobenzidine	330	U	54	%
Benzo(a)anthracene	330	U	95	%
Chrysene	330	U	67	%
bis(2-Ethylhexyl)phthalate	46	J	92	%
Di-n-octyl phthalate	330	U	97	%
Benzo(b)fluoranthene	330	U	81	%
Benzo(k)fluoranthene	330	U	89	%
Benzo(a)pyrene	330	U	81	%
Indeno(1,2,3-cd)pyrene	330	U	76	%
Dibenz(a,h)anthracene	330	U	77	%
Benzo(g,h,i)perylene	330	U	80	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L255
SDG/SAF # K1034/RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-30-2007

SEMIVOLATILE

Four (4) soil samples were collected on 11-28-2007.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 12-03-2007 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 12-04,11,12-2007.

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. Samples were extracted and analyzed within required holding time.

2. Non-target compounds were detected in the samples.

3. All surrogate recoveries were within acceptance criteria.

4. Eight (8) of one hundred and twenty-eight (128) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

5. Four (4) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. The method blank was below the reporting limit for all target compounds.

r:\group\data\2007\bna\tnu-hanford\0711-255ks2.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 19 pages.

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

LvLI
LIONVILLE LABORATORY INC.

7. All calibration criteria were met.

8. Internal standard area and retention time criteria were met.

9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/14/07
Date

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 07M5261

Initiator: Shawn Sylor
Date: 12-13-07
Client: TMS RCOG

Batch: 07 11L 255
Samples: 001 ms, msd, LCS
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: 07E0669

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)

low recovery of several spike analytes in the ms, msd + LCS

2. Known or Probable Causes(s) acidic phenols are subject to erratic chromatographic behavior; other specific [illegible]

3. Discussion and Proposed Action Other Description: narrate

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

4. Project Manager Instructions...signature/date: [signature] 12/14/07

__ 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: [signature] 12-14-07 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

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-029-030 | 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-52		SAF No.: RC-029
Ice Chest No.: AFS-04-0121	Field Logbook No.: EL-1601	COA: C00F52A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080059		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	G/P	aG	aG	G	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	250mL	120mL	250mL	250mL	60mL	250mL	250mL		
SAMPLE ANALYSIS	See item (3) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; ~~Pesticides - 8081~~ BH 11/28/07	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	See (3) below		

Sample No.	Matrix *	Sample Date	Sample Time										
~~J162R3~~	~~SOIL~~	BH 11/28/07											
J162R4	SOIL	11/28/07	1005			X	X	X	X		X		
J162R5	SOIL	11/28/07	1010			X	X	X	X		X		
J162R6	SOIL	11/28/07	1235			X	X	X	X		X		
J162P6	SOIL	11/28/07	1230									X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
T Welch Koelling	11/28/07 1430	BHUDSON BHudson	11/28/07 1430
BHUDSON BHudson	11/28/07 1530	3728 #2C	11/28/07 1530
3728 #2C	11-29-07 1100	KMSingleton	11-29-07 1100
KMSingleton	11-29-07 1500	FED EX	
FED EX	11/30/07 0945		11-30-07 0945

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) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

(3) ICP Metals, Hg; SVOA if sufficient material samples from 3728 Ref # 2C. 3728 Custodian removed samples for shipping on 11/29/07.

Matrix *
Se=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
Ti=Tissue
Wi=Wipe
L=Liquid
Ve=Vegetation
Xo=Other

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

WCH-EE-011

000019

0000000013

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-52			DATA PACKAGE: K1034		
VALIDATOR: ELR		LAB: LLI		DATE: 4/9/08	
			SDG: K1034		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J162R4	J162R5	J162R6	J162P6		
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

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

Comments:

GC/MS ORGANIC 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: MB - bis(2-ethylhexyl)phthalate U at RQL - all

FB - di-n-butyl phthalate

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound 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? (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: 2,4-dinitrophenol 4,6,dinitro-2-methylphenol - MS/MSD - J all

LCS - bis(2-chloroethyl)ether 2,2 oxybis(1-chloropropane
4-chloroaniline 2,4-dinitrophenol
4,6,dinitro-2-methylphenol pentachlorophenol
} J all

no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

MS/MSD RPD values 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: 4-chloroaniline - 35%
dibenz(a,h) anthracene - 30.7% > J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times 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:

7. HOLDING TIMES (all levels)

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

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

Comments:

GC/MS ORGANIC 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

Laboratory properly identified and coded all TIC? (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: 32 over

9. SAMPLE CLEANUP (Levels D and E)

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: 14 April 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Site 100-F-52
Subject: PCB - Data Package No. K1034-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1034 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
J162R4	11/28/07	Soil	C	PCBs by 8082
J162R5	11/28/07	Soil	C	PCBs by 8082
J162R6	11/28/07	Soil	C	PCBs by 8082

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.

All 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 (J162R4/J162R5) 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 results met the RQL.

- **Completeness**

Data Package No. K1034 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

None found.

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 DATA QUALIFICATION SUMMARY*

SDG: K1034	REVIEWER: ELR	Project: 100-F-52	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

PCBs by GC

Report Date: 12/11/07 13:11

RFW Batch Number: 0711L255 Client: TNUHANFORD RC-029 K1034 Work Order: 11343606001 Page: 1

	Cust ID:	J162R4	J162R4	J162R4	J162R5	J162R6	PBLKKE
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	07LE0668-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		97 %	102 %	99 %	98 %	103 %	98 %
Decachlorobiphenyl		94 %	96 %	91 %	93 %	97 %	96 %
Aroclor-1016		14 U	93 %	88 %	14 U	14 U	13 U
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1254		14 U	14 U	14 U	14 U	14 U	13 U
Aroclor-1260		14 U	100 %	92 %	14 U	14 U	13 U

	Cust ID:	PBLKKE BS
Sample Information	RFW#:	07LE0668-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate: Tetrachloro-m-xylene		87 %
Decachlorobiphenyl		90 %
Aroclor-1016		74 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		82 %

4/11/08

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

000000004

000010

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0711L255
SDG/SAF # K1034 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-30-2007

PCB

Three (3) soil samples were collected on 11-28-2007.

The samples and their associated QC samples were extracted on 12-03-2007 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 12-08-2007. 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 required holding times for extraction and analysis have been met.
2. 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.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. 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 9 pages.

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

LvLI
LIONVILLE LABORATORY INC.

9. 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.

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 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

12/13/07
Date

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

000002A

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-030 | Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Date Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-F-52		SAF No.: RC-029
Ice Chest No.: AFS-04-0121	Field Logbook No.: EL-1601	COA: C00F52A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080059		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	
Type of Container	P	G/P	G/P	G/P	aG	aG	G	G	aG	
No. of Container(s)	1	1	1	1	1	1	1	1	1	
Volume	1000mL	60mL	250mL	120mL	250mL	250mL	60mL	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~~ BH 11/28/07	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	See (3) below	

Sample No.	Matrix *	Sample Date	Sample Time										
~~J162R3~~	~~SOIL~~	BH 11/28/07											
J162R4	SOIL	11/28/07	1005			X	X	X	X		X		
J162R5	SOIL	11/28/07	1010			X	X	X	X		X		
J162R6	SOIL	11/28/07	1235			X	X	X	X		X		
J162P6	SOIL	11/28/07	1230									X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Welch-Koelling	11/28/07 1430	BHUDSON BHudson	11/28/07 1430
BHUDSON BHudson	11/28/07 1530	3728 #2C	11/28/07 1530
3728 #2C	11-29-07 1100	BMSingleton	11-29-07 1100
BMSingleton	11-29-07 1500	FED EX	
FedEx	11/30/07 0945		11-30-07 0945

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) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

(3) ICP Metals, Hg; SVOA if sufficient material samples from 3728 Ref # 2C. 3728 Custodian removed samples for shipping on 11/29/07.

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; Ve=Vegetation; X=Other

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

WCH-EE-011

000000006

000014

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-52			DATA PACKAGE: K1034		
VALIDATOR: ELR		LAB: LLI		DATE: 4/9/08	
			SDG: K1034		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J162R4 J162R5 J162R6					
					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: no PAS

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:

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: 14 April 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-52
Subject: Inorganics - Data Package No. K1034-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1034 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
J162R4	11/28/07	Soil	C	See note 1
J162R5	11/28/07	Soil	C	See note 1
J162R6	11/28/07	Soil	C	See note 1
J162P6	11/28/07	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

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.

All 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 calcium, sodium and zinc results in sample J162P6 were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J162P6) was submitted for analysis. Aluminum, barium, iron, potassium, magnesium, manganese, lead and silicon were detected in the equipment blank. 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.

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 (J162R4/J162R5) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for silicon (47%) was outside QC limits. 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. K1034 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 method blank contamination, the calcium, sodium and zinc results in sample J162P6 were qualified as undetected and flagged "UJ".

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: K1034	REVIEWER: ELR	Project: 100-F-52	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Sodium Zinc	UJ	J162P6	Method blank contamination

* - 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 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J162R4	Silver, Total	0.31	u	MG/KG	0.31	3.0
		Aluminum, Total	6020		MG/KG	12.3	3.0
		Arsenic, Total	2.5		MG/KG	1.5	3.0
		Boron, Total	1.5	u	MG/KG	1.5	3.0
		Barium, Total	57.2		MG/KG	0.31	3.0
		Beryllium, Total	0.48		MG/KG	0.15	3.0
		Calcium, Total	3840		MG/KG	12.3	3.0
		Cadmium, Total	0.15	u	MG/KG	0.15	3.0
		Cobalt, Total	5.4		MG/KG	0.62	3.0
		Chromium, Total	9.0		MG/KG	0.62	3.0
		Copper, Total	13.6		MG/KG	0.62	3.0
		Iron, Total	14200		MG/KG	13.8	3.0
		Mercury, Total	0.01		MG/KG	0.009	1.0
		Potassium, Total	946		MG/KG	12.3	3.0
		Magnesium, Total	3740		MG/KG	7.7	3.0
		Manganese, Total	268		MG/KG	0.12	3.0
		Molybdenum, Total	0.92	u	MG/KG	0.92	3.0
		Sodium, Total	188		MG/KG	6.2	3.0
		Nickel, Total	10.9		MG/KG	0.62	3.0
		Lead, Total	4.4		MG/KG	0.92	3.0
		Antimony, Total	0.92	u	MG/KG	0.92	3.0
		Selenium, Total	1.8	u	MG/KG	1.8	3.0
		Silicon, Total	2590		MG/KG	12.3	3.0
		Vanadium, Total	35.1		MG/KG	0.43	3.0
		Zinc, Total	35.8		MG/KG	1.8	3.0

4/11/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1034

LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J162R5	Silver, Total	0.29 u	MG/KG	0.29	3.0
		Aluminum, Total	5870	MG/KG	11.7	3.0
		Arsenic, Total	2.7	MG/KG	1.5	3.0
		Boron, Total	1.5 u	MG/KG	1.5	3.0
		Barium, Total	52.6	MG/KG	0.29	3.0
		Beryllium, Total	0.49	MG/KG	0.15	3.0
		Calcium, Total	3810	MG/KG	11.7	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	5.3	MG/KG	0.58	3.0
		Chromium, Total	8.9	MG/KG	0.58	3.0
		Copper, Total	13.8	MG/KG	0.58	3.0
		Iron, Total	14800	MG/KG	13.1	3.0
		Mercury, Total	0.01	MG/KG	0.008	1.0
		Potassium, Total	975	MG/KG	11.7	3.0
		Magnesium, Total	3850	MG/KG	7.3	3.0
		Manganese, Total	268	MG/KG	0.12	3.0
		Molybdenum, Total	0.87 u	MG/KG	0.87	3.0
		Sodium, Total	174	MG/KG	5.8	3.0
		Nickel, Total	10.8	MG/KG	0.58	3.0
		Lead, Total	3.9	MG/KG	0.87	3.0
		Antimony, Total	0.87 u	MG/KG	0.87	3.0
		Selenium, Total	1.7 u	MG/KG	1.7	3.0
		Silicon, Total	1600	MG/KG	11.7	3.0
		Vanadium, Total	34.3	MG/KG	0.41	3.0
		Zinc, Total	34.9	MG/KG	1.7	3.0

4/11/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1034

LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J162R6	Silver, Total	0.30 u	MG/KG	0.30	3.0
		Aluminum, Total	5210	MG/KG	11.9	3.0
		Arsenic, Total	3.1	MG/KG	1.5	3.0
		Boron, Total	1.5 u	MG/KG	1.5	3.0
		Barium, Total	67.6	MG/KG	0.30	3.0
		Beryllium, Total	0.49	MG/KG	0.15	3.0
		Calcium, Total	4090	MG/KG	11.9	3.0
		Cadmium, Total	0.15 u	MG/KG	0.15	3.0
		Cobalt, Total	4.9	MG/KG	0.59	3.0
		Chromium, Total	6.7	MG/KG	0.59	3.0
		Copper, Total	11.6	MG/KG	0.59	3.0
		Iron, Total	12200	MG/KG	13.4	3.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	1110	MG/KG	11.9	3.0
		Magnesium, Total	3150	MG/KG	7.4	3.0
		Manganese, Total	270	MG/KG	0.12	3.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	3.0
		Sodium, Total	174	MG/KG	5.9	3.0
		Nickel, Total	8.6	MG/KG	0.59	3.0
		Lead, Total	5.2	MG/KG	0.89	3.0
		Antimony, Total	0.89 u	MG/KG	0.89	3.0
		Selenium, Total	1.8 u	MG/KG	1.8	3.0
		Silicon, Total	2910	MG/KG	11.9	3.0
		Vanadium, Total	26.5	MG/KG	0.42	3.0
		Zinc, Total	36.1	MG/KG	1.8	3.0

4/11/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J162P6	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	56.8	MG/KG	3.7	1.0
		Arsenic, Total	0.47 u	MG/KG	0.47	1.0
		Boron, Total	0.47 u	MG/KG	0.47	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	23.5 UJ	MG/KG	3.7	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.19 u	MG/KG	0.19	1.0
		Chromium, Total	0.19 u	MG/KG	0.19	1.0
		Copper, Total	0.19 u	MG/KG	0.19	1.0
		Iron, Total	135	MG/KG	4.2	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	28.5	MG/KG	3.7	1.0
		Magnesium, Total	8.1	MG/KG	2.3	1.0
		Manganese, Total	3.8	MG/KG	0.04	1.0
		Molybdenum, Total	0.28 u	MG/KG	0.28	1.0
		Sodium, Total	12.0 UJ	MG/KG	1.9	1.0
		Nickel, Total	0.19 u	MG/KG	0.19	1.0
		Lead, Total	0.28	MG/KG	0.28	1.0
		Antimony, Total	0.28 u	MG/KG	0.28	1.0
		Selenium, Total	0.56 u	MG/KG	0.56	1.0
		Silicon, Total	71.9	MG/KG	3.7	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	1.5 UJ	MG/KG	0.56	1.0

4/11/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0711L255
SDG/SAF#: K1034/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 11-30-07

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 4 soil samples.

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

   All samples, with the exception of sample J162P6, 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).

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 {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.

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 4 analytes were outside the 75-125% control limits.

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 24 pages.

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

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
J162R4	Aluminum	72,000	97.3
	Iron	132,000	101.1
	Antimony	300	102.0
	Silicon	6,300	86.7

11. The duplicate analyses for 3 analytes were 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

12/17/07
Date

jjw/m11-255

LvLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-030	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-52		SAF No.: RC-029
Ice Chest No.: AFS-04-0121	Field Logbook No.: EL-1601	COA: C00F52A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080059		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	G/P	aG	aG	G	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	250mL	120mL	250mL	250mL	60mL	250mL	250mL		
SAMPLE ANALYSIS	See item (2) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; ~~Pesticides - 8081~~ BH 11/28/07	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	See (3) below		

Sample No.	Matrix *	Sample Date	Sample Time										
~~J162R3~~	~~SOIL~~	BH 11/28/07											
J162R4	SOIL	11/28/07	1005			X	X	X	X		X		
J162R5	SOIL	11/28/07	1010			X	X	X	X		X		
J162R6	SOIL	11/28/07	1235			X	X	X	X		X		
J162P6	SOIL	11/28/07	1230									X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	11/28/07 1430	BHUDSON BHudson	11/28/07 1430
BHUDSON BHudson	11/28/07 1530	3728 #2C	11/28/07 1530
3728 #2C	11-29-07 1100	KWashington	11-29-07 1100
KWashington	11-29-07 1500	FED EX	
FED EX	11/30/07 0945	[illegible]	11-30-07 0945

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) ICP Metals - 6010TR (SW846) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

(3) ICP Metals, Hg; SVOA if sufficient material samples from 3728 Ref# 2C. 3728 Custodian removed samples for shipping on 11/29/07.

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; Li=Liquid; Ve=Vegetation; X=Other

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

WCH-EE-011

000000020

000017

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-52		DATA PACKAGE:	K1034	
VALIDATOR:	ELR	LAB: LLI		DATE: 4/9/08	
			SDG: K1034		

ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		

SAMPLES/MATRIX
J162R4 J162R5 J152R6 J152P6
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: Calcium, sodium, zinc - PQ - UJ

FB - al, barium, iron, potassium, magnesium, manganese, lead, silicon,

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: 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: Silicon - FD - 47%

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: _____

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 12/14/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	07L0609-MB1	Silver, Total	0.1 u	MG/KG	0.1	1.0
		Aluminum, Total	3.9 u	MG/KG	3.9	1.0
		Arsenic, Total	0.49 u	MG/KG	0.49	1.0
		Boron, Total	0.49 u	MG/KG	0.49	1.0
		Barium, Total	0.1 u	MG/KG	0.1	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	7.3	MG/KG	3.9	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.19 u	MG/KG	0.19	1.0
		Chromium, Total	0.19 u	MG/KG	0.19	1.0
		Copper, Total	0.19 u	MG/KG	0.19	1.0
		Iron, Total	9.6	MG/KG	4.4	1.0
		Potassium, Total	3.9 u	MG/KG	3.9	1.0
		Magnesium, Total	2.4 u	MG/KG	2.4	1.0
		Manganese, Total	0.04 u	MG/KG	0.04	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	7.7 ~~19.1 u~~ *	MG/KG	* ~~19.1~~ 1.9	1.0
		Nickel, Total	0.19 u	MG/KG	0.19	1.0
		Lead, Total	0.29 u	MG/KG	0.29	1.0
		Antimony, Total	0.29 u	MG/KG	0.29	1.0
		Selenium, Total	0.58 u	MG/KG	0.58	1.0
		Silicon, Total	3.9 u	MG/KG	3.9	1.0
		Vanadium, Total	0.14 u	MG/KG	0.14	1.0
		Zinc, Total	1.5	MG/KG	0.58	1.0
BLANK1	07C0216-MB1	Mercury, Total	0.01 u	MG/KG	0.01	1.0

* corrected values
pw 12/14/07

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J162R4	Silver, Total	4.5	0.31u	5.1	88.2	3.0
		Aluminum, Total	5900	6020	205	-59. *	3.0
		Arsenic, Total	192	2.5	205	92.3	3.0
		Boron, Total	95.4	1.5 u	102	93.1	3.0
		Barium, Total	234	57.2	205	86.0	3.0
		Beryllium, Total	5.2	0.48	5.1	92.6	3.0
		Calcium, Total	6160	3840	2560	90.4	3.0
		Cadmium, Total	4.7	0.15u	5.1	92.2	3.0
		Cobalt, Total	51.6	5.4	51.3	90.1	3.0
		Chromium, Total	26.8	9.0	20.5	86.8	3.0
		Copper, Total	36.4	13.6	25.6	89.1	3.0
		Iron, Total	13200	14200	102	-1000. *	3.0
		Mercury, Total	0.18	0.01	0.15	111.5	1.0
		Potassium, Total	3160	946	2560	86.6	3.0
		Magnesium, Total	5860	3740	2560	82.7	3.0
		Manganese, Total	307	268	51.3	75.4*	3.0
		Molybdenum, Total	90.2	0.92u	102	88.0	3.0
		Sodium, Total	2480	188	2560	89.2	3.0
		Nickel, Total	56.2	10.9	51.3	88.3	3.0
		Lead, Total	51.4	4.4	51.3	91.6	3.0
		Antimony, Total	37.8	0.92u	51.3	73.7	3.0
		Selenium, Total	165	1.6 u	205	80.6	3.0
		Silicon, Total	2320	2590	102	-260. *	3.0
		Vanadium, Total	77.2	35.1	51.3	82.1	3.0
		Zinc, Total	79.7	35.8	51.3	85.6	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/14/07

CLIENT: TNUHANFORD RC-D29 K1D34 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD		DILUTION FACTOR(REP)
-001REP	J162R4	Silver, Total	0.31u	0.31u	NC		3.0
		Aluminum, Total	6020	5440	10.1		3.0
		Arsenic, Total	2.5	3.9	43.8		3.0
		Boron, Total	1.5 u	1.5 u	NC		3.0
		Barium, Total	57.2	52.6	8.4		3.0
		Beryllium, Total	0.48	0.46	3.3		3.0
		Calcium, Total	3840	3630	5.7		3.0
		Cadmium, Total	0.15u	0.15u	NC		3.0
		Cobalt, Total	5.4	5.0	7.7		3.0
		Chromium, Total	9.0	7.8	14.3		3.0
		Copper, Total	13.6	13.1	3.7		3.0
		Iron, Total	14200	12900	9.5		3.0
		Mercury, Total	0.01	0.01u	~~NC~~	zero corrected value mw 12/14/07	1.0
		Potassium, Total	946	907	4.2		3.0
		Magnesium, Total	3740	3390	9.9		3.0
		Manganese, Total	268	254	5.3		3.0
		Molybdenum, Total	0.92u	0.92u	NC		3.0
		Sodium, Total	188	163	14.2		3.0
		Nickel, Total	10.9	9.5	13.7		3.0
		Lead, Total	4.4	3.4	25.6		3.0
		Antimony, Total	0.92u	0.92u	NC		3.0
		Selenium, Total	1.8 u	1.8 u	NC		3.0
		Silicon, Total	2590	2220	15.4		3.0
		Vanadium, Total	35.1	30.8	13.1		3.0
		Zinc, Total	35.8	31.8	11.8		3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/14/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

WORK ORDER: 11343-606-001-9999-0C

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	07L0609-LC1	Silver, LCS	47.3	50.0	MG/KG	94.6
		Aluminum, LCS	484	500	MG/KG	96.7
		Arsenic, LCS	911	1000	MG/KG	91.1
		Boron, LCS	464	500	MG/KG	92.7
		Barium, LCS	480	500	MG/KG	96.0
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2400	2500	MG/KG	95.9
		Cadmium, LCS	23.7	25.0	MG/KG	94.8
		Cobalt, LCS	240	250	MG/KG	96.1
		Chromium, LCS	47.8	50.0	MG/KG	95.6
		Copper, LCS	121	125	MG/KG	96.5
		Iron, LCS	487	500	MG/KG	97.4
		Potassium, LCS	2360	2500	MG/KG	94.5
		Magnesium, LCS	2360	2500	MG/KG	94.6
		Manganese, LCS	73.1	75.0	MG/KG	97.5
		Molybdenum, LCS	460	500	MG/KG	92.0
		Sodium, LCS	2360	2500	MG/KG	94.2
		Nickel, LCS	190	200	MG/KG	95.1
		Lead, LCS	237	250	MG/KG	94.9
		Antimony, LCS	277	300	MG/KG	92.2
		Selenium, LCS	881	1000	MG/KG	88.1
		Silicon, LCS	441	500	MG/KG	88.1
		Vanadium, LCS	241	250	MG/KG	96.3
		Zinc, LCS	95.4	100	MG/KG	95.4
LCS1	07C0216-LC1	Mercury, LCS	4.9	4.7	MG/KG	104.4

Date: 14 April 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-F-52
Subject: Wet Chemistry - Data Package No. K1034-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1034 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
J162R4	11/28/07	Soil	C	See note 1
J162R5	11/28/07	Soil	C	See note 1
J162R6	11/28/07	Soil	C	See note 1

1 – Chromium VI by 7196A & 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 (J162R4/J162R5) 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 K1034 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: K1034	REVIEWER: ELR	Project: 100-F-52	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 12/12/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J162R4	% Solids	96.6		%	0.01	1.0
		Chromium VI	0.21	u	MG/KG	0.21	1.0
		Petroleum Hydrocarbons	138	u	MG/KG	138	1.0
-002	J162R5	% Solids	97.2		%	0.01	1.0
		Chromium VI	0.80		MG/KG	0.21	1.0
		Petroleum Hydrocarbons	137	u	MG/KG	137	1.0
-003	J162R6	% Solids	96.2		%	0.01	1.0
		Chromium VI	1.1		MG/KG	0.21	1.0
		Petroleum Hydrocarbons	138	u	MG/KG	138	1.0
-004	J162P6	% Solids	100		%	0.01	1.0

4/11/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029 K1034
LVL#: 0711L255

W.O.#: 11343-606-001-9999-00
Date Received: 11-30-07

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 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 Chromium VI, Percent Solids and PHC were within the 20% Relative Percent Difference (RPD) control limit.

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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/14/07
Date

njp\i11-255

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-029-030 | 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-52		SAF No.: RC-029
Ice Chest No.: AFS-04-0121	Field Logbook No.: EL-1601	COA: C00F52A000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A080059		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container	P	G/P	G/P	G/P	aG	aG	G	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	250mL	120mL	250mL	250mL	60mL	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~~ BH 11/28/07	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	See (3) below		

Sample No.	Matrix *	Sample Date	Sample Time										
~~J162R3~~	~~SOIL~~	BH 11/28/07											
J162R4	SOIL	11/28/07	1005			X	X	X	X		X		
J162R5	SOIL	11/28/07	1010			X	X	X	X		X		
J162R6	SOIL	11/28/07	1235			X	X	X	X		X		
J162P6	SOIL	11/28/07	1230									X	

000013

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Welch-Koelling	11/28/07 1430	BHUDSON	11/28/07 1430
Relinquished By/Removed From	BHUDSON	11/28/07 1530	3728 #2C	11/28/07 1530
Relinquished By/Removed From	3728 #2C	11-29-07 1100	Billingsleton	11-29-07 1100
Relinquished By/Removed From	Billingsleton	11-29-07 1500	FED EX	
Relinquished By/Removed From	FED EX	11/30/07 0945		11-30-07 0945
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) ICP Metals - 6010TR (SW846) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7471 - (CV)

(3) ICP Metals, Hg; SVOA if sufficient material samples from 3728 Ref #2C. 3728 Custodian removed samples for shipping on 11/29/07.

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
Te=Tissue
Wi=Wipe
L=Liquid
Ve=Vegetation
X=Other

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

VCH-EE-011

000000010

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-F-52		DATA PACKAGE:	K1034	
VALIDATOR:	ELR	LAB: LLI		DATE: 4/9/08	
			SDG: K1034		

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
J162R4 J162R5 J162R6
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 PH over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/12/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	07LVI098-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0
BLANK10	07LHC041-MB1	Petroleum Hydrocarbons	133 u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/12/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 0711L255

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J162R4	Soluble Chromium VI	4.4	0.21u	4.1	102.4	1.0
		Insoluble Chromium VI	1390	0.21u	1310	106.5	100
-002	J162R5	Petroleum Hydrocarbons	568	5.8	574	98.0	1.0
BLANK10	07LVI098-MB1	Soluble Chromium VI	3.9	0.20u	4.0	97.7	1.0
		Insoluble Chromium VI	1140	0.20u	1200	94.8	100
BLANK10	07LHC041-MB1	Petroleum Hydrocarbons	554	133 u	560	99.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 12/12/07

CLIENT: TNUHANFORD RC-029 K1034 LVL LOT #: 07111255

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J162R4	Chromium VI	0.21u	0.21u	NC	1.0
-002REP	J162R5	Petroleum Hydrocarbons	137 u	137 u	NC	1.0
-003REP	J162R6	% Solids	96.2	96.6	0.43	1.0