0076747

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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K1091 SAF-RC-029

Waste Site: 100-F-44:2

RECEIVED
APR 02 2008
EDMC

Date: 21 March 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Subsite 100-F-44:2
Subject: Radiochemistry - Data Package No. K1091-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1091 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
J16358	1/16/08	Soil	C	See note 1
J16359	1/16/08	Soil	C	See note 1

1 – Gamma spectroscopy.

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

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

All 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 (J16358/J16359) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

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

- **Completeness**

Data package No. K1091 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

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

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K1091	REVIEWER: ELR	Project: 100-F-44-2	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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1091

7749-001 J16358

DATA SHEET

SDG	7749	Client/Case no	Hanford	SDG K1091	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R801083-01	Client sample id	J16358		
Dept sample id	7749-001	Location/Matrix	100-F-44:2	SOLID	
Received	01/18/08	Collected/Weight	01/16/08 13:50	1515 g	
% solids	98.8	Custody/SAF No	RC-029-031	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	14.0	0.48	0.163			GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.100	U	GAM
Radium 226	13982-63-3	0.368	0.035	0.034	0.100		GAM
Radium 228	15262-20-1	0.680	0.082	0.074	0.200		GAM
Europium 152	14683-23-9	U		0.055	0.100	U	GAM
Europium 154	15585-10-1	U		0.055	0.100	U	GAM
Europium 155	14391-16-3	U		0.068	0.100	U	GAM
Thorium 228	14274-82-9	0.568	0.030	0.030			GAM
Thorium 232	TH-232	0.680	0.082	0.074			GAM
Uranium 235	15117-96-1	U		0.100		U	GAM
Uranium 238	U-238	U		2.34		U	GAM
Americium 241	14596-10-2	U		0.090		U	GAM

Remaining Sites Confirmation Smplg.

RPV 3/20/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/25/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1091

7749-002 J16359

DATA SHEET

SDG	7749	Client/Case no	Hanford	SDG K1091	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R801083-02	Client sample id	J16359		
Dept sample id	7749-002	Location/Matrix	100-F-44:2	SOLID	
Received	01/18/08	Collected/Weight	01/16/08 13:52	1582 g	
% solids	98.8	Custody/SAF No	RC-029-031	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	14.1	0.81	0.345			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Cesium 137	10045-97-3	U		0.029	0.100	U	GAM
Radium 226	13982-63-3	0.468	0.071	0.071	0.100		GAM
Radium 228	15262-20-1	0.638	0.17	0.166	0.200		GAM
Europium 152	14683-23-9	U		0.084	0.100	U	GAM
Europium 154	15585-10-1	U		0.127	0.100	U	GAM
Europium 155	14391-16-3	U		0.104	0.100	U	GAM
Thorium 228	14274-82-9	0.730	0.066	0.063			GAM
Thorium 232	TH-232	0.638	0.17	0.166			GAM
Uranium 235	15117-96-1	U		0.154		U	GAM
Uranium 238	U-238	U		4.39		U	GAM
Americium 241	14596-10-2	U		0.274		U	GAM

Remaining Sites Confirmation Smplg.

3/20/08

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/25/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1091 was composed of two solid (soil) samples designated under SAF No. RC-029 with a Project Designation of: Remaining Sites Confirmation Sampling-Soil.

The samples were received as stated on the chain-of-custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on January 25, 2008.

2.0 ANALYSIS NOTES

2.1 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

02/29/08
Date

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

Collector Welch-Koelling	Company Contact Matt Perrott	Telephone No. 372-9088	Project Coordinator KESSNER, JH
Project Designation Remaining Sites Confirmation Sampling - Soil	Sampling Location ~~100-F-46~~ 100-F-44:2 BH 1/16/08 K1091 (7749)		SAF No. RC-029
Ice Chest No. EBC-08-023	Field Logbook No. EL-1601-2	COA 000F44A000 ~~C00F46A000~~ BH 1/16/08	Method of Shipment FedEx
Shipped To EBERLINE SERVICES / ~~LIONVILLE~~ BH 1/16/08	Offsite Property No. A080157		Bill of Lading/Air Bill No. See OSRC

Price Code 8C

Data Turnaround 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000014

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	P	G/P	G	G/P	aG	aG	G			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	500mL	60mL	120mL	250mL	250mL	250mL			

SAMPLE ANALYSIS

				See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	PAHs - 8310	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time										
~~J16355~~	~~SOIL~~												
~~J16356~~	~~SOIL~~												
~~J16357~~	~~SOIL~~												
J16358	SOIL	1/16/08	1350	X									
J16359	SOIL	1/16/08	1352	X									

BH 1/16/08

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Tucker Koelling	1/16/08 1430	BHUDSON BHudson	1/16/08 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
BHUDSON BHudson	1/16/08 1515	3728 #2C	1/16/08 1515
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728 #2C	1-17-08 0830	MSingleton	1-17-08 0830
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MSingleton	1-17-08 1500	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX			01/18/08 09:30
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); ~~Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium~~ BH 1/16/08
(2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 1/17/08
Sampler unavailable to relinquish

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

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-44:2			DATA PACKAGE: K1091		
VALIDATOR: ELR		LAB: EB		DATE: 3/18/08	
			SDG: K1091		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J16358	J16359				
					Soil

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

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

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

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

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

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

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

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

Comments: no FS or PAS

12. Holding Times (All levels)

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

Comments: _____

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

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

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

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

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

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

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

Comments: 2 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1091

7749-004 Method Blank

METHOD BLANK

SDG	7749	Client/Case no	Hanford	SDG K1091	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R801083-04	Client sample id	Method Blank		
Dept sample id	7749-004	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		0.286		U	GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	U		0.026	0.100	U	GAM
Radium 226	13982-63-3	U		0.027	0.100	U	GAM
Radium 228	15262-20-1	U		0.055	0.200	U	GAM
Europium 152	14683-23-9	U		0.031	0.100	U	GAM
Europium 154	15585-10-1	U		0.034	0.100	U	GAM
Europium 155	14391-16-3	U		0.033	0.100	U	GAM
Thorium 228	14274-82-9	U		0.018		U	GAM
Thorium 232	TH-232	U		0.055		U	GAM
Uranium 235	15117-96-1	U		0.049		U	GAM
Uranium 238	U-238	U		1.31		U	GAM
Americium 241	14596-10-2	U		0.067		U	GAM

Remaining Sites Confirmation Smplg.

QC-BLANK 64432

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/25/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1091

7749-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7749
Contact Melissa C. Mannion

Client/Case no Hanford SDG K1091
Contract No. 630

Lab sample id R801083-03
Dept sample id 7749-003

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Cobalt 60	0.500	0.037	0.021	0.050		GAM	0.514	0.021	97	75-125	80-120
Cesium 137	0.538	0.038	0.029	0.100		GAM	0.536	0.021	100	74-126	80-120

Remaining Sites Confirmation Smplg.

QC-LCS 64431

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/25/08

Date: 21 March 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil - Waste Subsite 100-F-44:2
Subject: Pesticide/PCB - Data Package No. K1091-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1091 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
J16358	1/16/08	Soil	C	See note 1
J16359	1/16/08	Soil	C	See note 1

1 – PCBs by 8082 and pesticides by 8081A.

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
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Appendix 3. Annotated Laboratory Reports
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Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

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

Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

Due to matrix spike (49%) and matrix spike duplicate (46%) results outside QC limits, all delta-BHC results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (82%), all endrin ketone results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J16358/J16359) 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 toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data Package No. K1091 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, matrix spike duplicate and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".
- Due to matrix spike (49%) and matrix spike duplicate (46%) results outside QC limits, all delta-BHC results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (82%), all endrin ketone 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.

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

PESTICIDE/PCB DATA QUALIFICATION SUMMARY*

SDG: K1091	REVIEWER: ELR	Project: 100-F-44:2	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS recovery
Delta-BCH	J	All	MS & MSD recovery
Endrin ketone	J	All	LCS recovery

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

Appendix 3

Annotated Laboratory Reports

PCBs by GC

Report Date: 01/25/08 12:51

RFW Batch Number: 0801L468 Client: TNU-HANFORD RC-029 Work Order: 11343606001 Page: 1

	Cust ID:	J16358	J16358	J16358	J16359	PBLKLU	PBLKLU BS
Sample Information	RFW#:	002	002 MS	002 MSD	003	08LE0031-MB1	08LE0031-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		112 %	120 %	112 %	118 %	98 %	97 %
Decachlorobiphenyl		136 %	140 %	132 %	140 %	106 %	104 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		13 U	102 %	99 %	13 U	13 U	88 %
Aroclor-1221		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1232		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1242		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1248		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1254		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1260		13 U	113 %	110 %	13 U	13 U	100 %

000011

VR 3/20/08

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

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 01/25/08 13:20

RFW Batch Number: 0801L468 Client: TNU-HANFORD RC-029 Work Order: 11343606001 Page: 1

000000006

	Cust ID:	J16358	J16358	J16358	J16359	PBLKLU	PBLKLU BS
Sample Information	RFW#:	002	002 MS	002 MSD	003	08LE0031-MB1	08LE0031-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	74 %	83 %	81 %	85 %	76 %	78 %
	Decachlorobiphenyl	70 %	77 %	78 %	81 %	71 %	70 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.3 U	76 %	73 %	1.3 U	0.33 U	86 %
gamma-BHC (Lindane)		1.3 U	82 %	79 %	1.3 U	0.33 U	86 %
Beta-BHC		1.3 U	92 %	89 %	1.3 U	0.33 U	86 %
Heptachlor		1.3 U	92 %	91 %	1.3 U	0.33 U	84 %
Delta-BHC		1.3 UJ	49 * %	46 * %	1.3 UJ	0.33 U	58 %
Aldrin		1.3 U	85 %	83 %	1.3 U	0.33 U	87 %
Heptachlor epoxide		1.3 U	94 %	92 %	1.3 U	0.33 U	87 %
gamma-Chlordane		1.3 U	94 %	92 %	1.3 U	0.33 U	88 %
Endosulfan I		1.3 U	100 %	98 %	1.3 U	0.33 U	90 %
alpha-Chlordane		1.3 U	95 %	93 %	1.3 U	0.33 U	88 %
4,4'-DDE		1.3 U	102 %	98 %	1.3 U	0.33 U	96 %
Dieldrin		1.3 U	92 %	90 %	1.3 U	0.33 U	90 %
Endrin		1.3 U	98 %	95 %	1.3 U	0.33 U	89 %
4,4'-DDD		1.3 U	92 %	88 %	1.3 U	0.33 U	91 %
Endosulfan II		1.3 U	98 %	95 %	1.3 U	0.33 U	89 %
4,4'-DDT		1.3 U	89 %	86 %	1.3 U	0.33 U	89 %
Endrin aldehyde		1.3 U	98 %	95 %	1.3 U	0.33 U	83 %
Endosulfan sulfate		1.3 U	90 %	88 %	1.3 U	0.33 U	79 %
Methoxychlor		1.3 U	95 %	94 %	1.3 U	0.33 U	80 %
Endrin ketone		1.3 UJ	96 %	93 %	1.3 UJ	0.33 U	82 * %
Toxaphene		13 UJ	13 U	13 U	13 UJ	3.3 U	3.3 U

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

3/20/08

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0801L468
SDG/SAF # K1080 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 01-18-2008

PCB

Two (2) soil samples were collected on 01-16-2008.

The samples and their associated QC samples were extracted on 01-22-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 01-23,24-2008. 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. The samples were extracted and analyzed within required holding time.
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. The 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.

r:\group\data\2008\pest\tnu\0801-468ks2 pcb.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

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

1/30/08
Date

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

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0801L468
SDG/SAF # K1080 / RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 01-18-2008

CHLORINATED PESTICIEDES

Two (2) soil samples were collected on 01-16-2008.

The samples and their associated QC samples were extracted on 01-22-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 01-23-2008. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

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. The samples were extracted and analyzed within required holding time.
2. The method blank was below the reporting limits for all target compounds.
3. All surrogate recoveries were within acceptance criteria.
4. One (1) of twenty (20) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
5. Two (2) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All samples required a 4-fold instrument dilution due to the matrix.
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.

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000016

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

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

1/30/02
Date

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 08GC010

Initiator: CAC
Date: 01-25-08
Client: TNU

Batch: 0801L468
Samples: 002MS/MSD BS
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: SOIL
Prep Batch: 08LE0031

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)

Delta-BHC recovery low in ms/msd
Endrin ketone recovery low in BS

2. Known or Probable Causes(s)

Delta BHC is prone to degredation.

3. Discussion and Proposed Action

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

Other Description:

δ-BHC OK in BS.
Endrin ketone @ 82% recovery will not bias data.
Narrate 2D.

4. Project Manager Instructions...signature/date: gh 1/31/08
✓ 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: RAD 1-30-08

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

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
Welch-Koelling	Matt Perrott	372-9088	KESSNER, JH	8C	15 Days

Project Designation	Sampling Location	SAF No.
Remaining Sites Confirmation Sampling - Soil	~~100-F-46~~ 100-F-44:2 BH 1/16/08	RC-029

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-505	EL-1601-2	COCF44A000 ~~C00F46A000~~ BH 1/16/08	FedEx

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
BH 1/16/08 ~~EBERLINE SERVICES~~ LIONVILLE	A080176	See BSPC

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	G/P	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	PAHs - 8310	TPH (Total) - 418.1	See item (2)		

BH 1/16/08

Sample No.	Matrix *	Sample Date	Sample Time										
~~J16355~~ BH 1/16/08	SOIL												
J16356	SOIL												
~~J16357~~ J16375	SOIL	1/16/08	1330								X		
J16358	SOIL	1/16/08	1350			X	X	X		X			
J16359	SOIL	1/16/08	1352			X	X	X		X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	1/16/08 1430	BHudson BHudson	1/16/08 1430
BHudson BHudson	1/16/08 1515	3728 #2C	1/16/08 1515
3728 #2C	1-17-08 0830	KWSingleton	1-17-08 0830
KWSingleton	1-17-08 1500	FED EX	
Fed Ex	1-18-08 0950	[illegible]	1-18-08 0950

SPECIAL INSTRUCTIONS

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

samples from 3728 Ref# 2C
3728 Custodian removed samples for shipping on 1/17/08.
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
Wt=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

000019

000000009

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-44:2			DATA PACKAGE: K1091		
VALIDATOR: ELR		LAB: LLI		DATE: 3/17/08	
			SDG: K1091		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J16358 J16359					
					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) ..... no ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... na ..... Yes No N/A 3/11/08

Transcription/calculation errors? (Levels D, E) ..... na ..... Yes No N/A 3/11/08

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: delta-BHC 49 + 46% – MS/MSD – J all

LCS – endrin Ketone 82% – J all

no toxaphene MS/MSD/LCS – J all 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: toxaphene - no MS/MSD - J all

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: ~~[illegible]~~ 3/17/02 toxaphene - all over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 21 March 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Subsite 100-F-44:2
Subject: Inorganics - Data Package No. K1091-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1091 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
J16358	1/16/08	Soil	C	See note 1
J16359	1/16/08	Soil	C	See note 1
J16375	1/16/08	Soil	C	See note 1
J16358T	1/16/08	Soil	C	See note 2
J16359T	1/16/08	Soil	C	See note 2
J16375T	1/16/08	Soil	C	See note 2

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

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, copper, sodium and zinc results in sample J16375 were qualified as undetected and flagged "UJ".

Due to method blank contamination, the lead results in samples J16358T and J16359T were qualified as estimates and flagged "UJ".

Due to method blank contamination, the mercury result in sample J16358T was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

Two field blanks (J16375 & J16375T) were submitted for analysis. Aluminum, arsenic, barium, iron, potassium, magnesium, manganese and silicon were detected in J16375 and barium was detected in sample J16375T. 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 (J16358/J16359) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for barium (44%) and vanadium (36%) exceeded QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K1091 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, copper, sodium and zinc results in sample J16375 were qualified as undetected and flagged "UJ".
- Due to method blank contamination, the lead results in samples J16358T and J16359T were qualified as estimates and flagged "UJ".
- Due to method blank contamination, the mercury result in sample J16358T was qualified as an estimate 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: K1091	REVIEWER: ELR	Project: 100-F-44:2	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Copper Sodium Zinc	UJ	J16375	Method blank contamination
Lead	UJ	J16358T, J16359T	Method blank contamination
Mercury	UJ	J16358T	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 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J15375	Silver, Total	0.1 u	MG/KG	0.1	1.0
		Aluminum, Total	35.4	MG/KG	3.8	1.0
		Arsenic, Total	0.56	MG/KG	0.48	1.0
		Boron, Total	0.48 u	MG/KG	0.48	1.0
		Barium, Total	1.1	MG/KG	0.1	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Calcium, Total	25.8 UJ	MG/KG	2.8	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	0.39 UJ	MG/KG	0.19	1.0
		Iron, Total	82.2	MG/KG	4.3	1.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	19.1	MG/KG	3.8	1.0
		Magnesium, Total	8.6	MG/KG	2.4	1.0
		Manganese, Total	2.6	MG/KG	0.04	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	16.7 UJ	MG/KG	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	53.8	MG/KG	3.8	1.0
		Vanadium, Total	0.13 u	MG/KG	0.13	1.0
		Zinc, Total	2.0 UJ	MG/KG	0.58	1.0

3/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J16358	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Aluminum, Total	5190	MG/KG	3.5	1.0
		Arsenic, Total	2.1	MG/KG	0.44	1.0
		Boron, Total	1.8	MG/KG	0.44	1.0
		Barium, Total	51.8	MG/KG	0.09	1.0
		Beryllium, Total	0.14	MG/KG	0.04	1.0
		Calcium, Total	3590	MG/KG	3.5	1.0
		Cadmium, Total	0.05	MG/KG	0.04	1.0
		Cobalt, Total	4.8	MG/KG	0.18	1.0
		Chromium, Total	9.2	MG/KG	0.18	1.0
		Copper, Total	14.8	MG/KG	0.18	1.0
		Iron, Total	13000	MG/KG	4.0	1.0
		Mercury, Total	0.02	MG/KG	0.009	1.0
		Potassium, Total	614	MG/KG	3.5	1.0
		Magnesium, Total	3630	MG/KG	2.2	1.0
		Manganese, Total	235	MG/KG	0.04	1.0
		Molybdenum, Total	0.27 u	MG/KG	0.27	1.0
		Sodium, Total	141	MG/KG	1.8	1.0
		Nickel, Total	10.6	MG/KG	0.18	1.0
		Lead, Total	3.2	MG/KG	0.27	1.0
		Antimony, Total	0.27 u	MG/KG	0.27	1.0
		Selenium, Total	0.53 u	MG/KG	0.53	1.0
		Silicon, Total	2050	MG/KG	3.5	1.0
		Vanadium, Total	31.6	MG/KG	0.12	1.0
		Zinc, Total	90.7	MG/KG	0.53	1.0

3/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802LS82

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J16359	Silver, Total	0.1 u	MG/KG	0.1	1.0
		Aluminum, Total	4170	MG/KG	3.8	1.0
		Arsenic, Total	2.2	MG/KG	0.48	1.0
		Boron, Total	1.4	MG/KG	0.48	1.0
		Barium, Total	32.9	MG/KG	0.1	1.0
		Beryllium, Total	0.13	MG/KG	0.05	1.0
		Calcium, Total	2990	MG/KG	3.8	1.0
		Cadmium, Total	0.07	MG/KG	0.05	1.0
		Cobalt, Total	4.1	MG/KG	0.19	1.0
		Chromium, Total	7.0	MG/KG	0.19	1.0
		Copper, Total	14.4	MG/KG	0.19	1.0
		Iron, Total	9920	MG/KG	4.3	1.0
		Mercury, Total	0.009u	MG/KG	0.009	1.0
		Potassium, Total	520	MG/KG	3.8	1.0
		Magnesium, Total	2940	MG/KG	2.4	1.0
		Manganese, Total	188	MG/KG	0.04	1.0
		Molybdenum, Total	0.29 u	MG/KG	0.29	1.0
		Sodium, Total	149	MG/KG	1.9	1.0
		Nickel, Total	9.3	MG/KG	0.19	1.0
		Lead, Total	3.1	MG/KG	0.29	1.0
		Antimony, Total	0.29 u	MG/KG	0.29	1.0
		Selenium, Total	0.57 u	MG/KG	0.57	1.0
		Silicon, Total	2900	MG/KG	3.8	1.0
		Vanadium, Total	22.0	MG/KG	0.13	1.0
		Zinc, Total	81.6	MG/KG	0.57	1.0

3/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/30/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J16375	Silver, TCLP Leachate	6.0	u	UG/L	6.0	6.0
		Arsenic, TCLP Leachate	30.0	u	UG/L	30.0	6.0
		Barium, TCLP Leachate	46.2		UG/L	6.0	6.0
		Cadmium, TCLP Leachate	3.0	u	UG/L	3.0	6.0
		Chromium, TCLP Leachate	12.0	u	UG/L	12.0	6.0
		Mercury, TCLP Leachate	0.06	u	UG/L	0.06	1.0
		Lead, TCLP Leachate	18.0	u	UG/L	18.0	6.0
		Selenium, TCLP Leachate	36.0	u	UG/L	36.0	6.0
-005	J16358	Silver, TCLP Leachate	6.0	u	UG/L	6.0	6.0
		Arsenic, TCLP Leachate	30.0	u	UG/L	30.0	6.0
		Barium, TCLP Leachate	155		UG/L	6.0	6.0
		Cadmium, TCLP Leachate	3.0	u	UG/L	3.0	6.0
		Chromium, TCLP Leachate	12.0	u	UG/L	12.0	6.0
		Mercury, TCLP Leachate	0.11	UJ	UG/L	0.06	1.0
		Lead, TCLP Leachate	28.1	UJ	UG/L	18.0	6.0
		Selenium, TCLP Leachate	36.0	u	UG/L	36.0	6.0

3/20/08

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/30/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J16359	Silver, TCLP Leachate	6.0	u	UG/L	6.0	6.0
		Arsenic, TCLP Leachate	30.0	u	UG/L	30.0	6.0
		Barium, TCLP Leachate	131		UG/L	6.0	6.0
		Cadmium, TCLP Leachate	3.0	u	UG/L	3.0	6.0
		Chromium, TCLP Leachate	12.0	u	UG/L	12.0	6.0
		Mercury, TCLP Leachate	0.06	u	UG/L	0.06	1.0
		Lead, TCLP Leachate	19.7	UJ	UG/L	18.0	6.0
		Selenium, TCLP Leachate	36.0	u	UG/L	36.0	6.0

3/20/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0802L582
SDG/SAF#: K1091/RC-092

W.O.#: 11343-606-001-9999-00
Date Relogged: 02-13-08

METALS CASE NARRATIVE

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

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

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

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

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

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of the ICV, CCV1, and CCV2 for Sodium. The samples were rerun in file PS0220A.

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

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

   a). The MB result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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

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

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 23 pages.

9. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J168X4	Aluminum	22,000	102.6
	Iron	22,000	89.9
	Selenium	100	103.5
	Silicon	7,800	82.5

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.

Judy Strom

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/27/03
Date

jjw/m08-582

LvLI
LIONVILLE LABORATORY INC.

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0801L468
SDG/SAF#: K1091/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 01-18-08

METALS CASE NARRATIVE

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

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

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were reported with 6-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 LOQ).

6. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), MB value less than 5% of the RCRA limit, 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 duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

10. The TCLP extract from sample J16375 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method 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 18 pages.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

1/30/08
Date

jjw/m01-468

LVLI
LIONVILLE LABORATORY INC.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-031 | Page 1 of 1

Collector: Welch-Koelling	Company Contact: Matt Perrott	Telephone No.: 372-9088	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: ~~100-F-46~~ 100-F-44-2 BH 1/16/08		SAF No.: RC-029
Ice Chest No.: ERC-02-505	Field Logbook No.: EL-1601-2	COA: C00F44A000 ~~C00F46A000~~ BH 1/16/08	Method of Shipment: FedEx
Shipped To: BH 1/16/08 ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No.: A080176		Bill of Lading/Air Bill No.: See BSPC

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	G/P	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL	250mL		

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	PAHs - 8310	TPH (Total) - 418.1	See item (2)		
~~J16355~~ BH 1/16/08	SOIL												
J16356	SOIL												
~~J16357~~ J16375	SOIL	1/16/08	1330								X		
J16358	SOIL	1/16/08	1350			X	X	X		X			
J16359	SOIL	1/16/08	1352			X	X	X		X			

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	1/16/08 1430	BHudson BHudson	1/16/08 1430
BHudson BHudson	1/16/08 1515	3728 #2C	1/16/08 1515
3728 #2C 1-17-08	0830	KWSingleton	1-17-08 0830
KWSingleton 1-17-08	WCH 1-17-08 1500	FED EX	
Fed Ex	1-18-09 0950	[signature]	1-18-09 0950
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

samples from 3728 Ref # 2C
3728 Custodian removed samples for shipping on 1/17/08.
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

000000017

100020

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-44:2			DATA PACKAGE: K1091		
VALIDATOR: ELR		LAB: LLI		DATE: 3/12/08	
			SDG: K1091		

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

SAMPLES/MATRIX		
J16375	J16358	J16359
J16375T	J16358T	J16359T - TCLP
		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: 7S – Calcium, copper, Sodium, zinc – UJ
58J + 59T – lead – UJ
58T – mercury – UJ

FB – 75T – Barium 7S – al, arsenic, barium, fe, Potassium magnesium, manganese, 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: FD-barium - 44% Vanadium -36%.

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 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0067-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	10.8		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	0.20		MG/KG	0.19	1.0
		Iron, Total	4.4	u	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	12.1		MG/KG	1.9	1.0
		Nickel, Total	0.19	u	MG/KG	0.19	1.0
		Lead, Total	0.34		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	1.7		MG/KG	0.58	1.0
BLANK1	08C0036-MB1	Mercury, Total	0.01	u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/25/08

CLIENT: TNUHANPORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J16358	Mercury, Total	0.17	0.02	0.15	104.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	J16359	Silver, Total	4.2	0.1 u	4.8	87.5	1.0
		Aluminum, Total	4860	4170	191	356.7*	1.0
		Arsenic, Total	164	2.2	191	85.1	1.0
		Boron, Total	85.2	1.4	95.4	87.8	1.0
		Barium, Total	206	32.9	191	90.6	1.0
		Beryllium, Total	4.4	0.13	4.8	88.9	1.0
		Calcium, Total	5420	2990	2380	102.1	1.0
		Cadmium, Total	4.2	0.07	4.8	86.1	1.0
		Cobalt, Total	46.6	4.1	47.7	89.1	1.0
		Chromium, Total	25.0	7.0	19.1	94.2	1.0
		Copper, Total	35.8	14.4	23.8	89.9	1.0
		Iron, Total	10600	9920	95.4	696.3*	1.0
		Potassium, Total	2570	520	2380	86.0	1.0
		Magnesium, Total	5430	2940	2380	104.6	1.0
		Manganese, Total	243	188	47.7	113.8	1.0
		Molybdenum, Total	82.1	0.29u	95.4	86.1	1.0
		Sodium, Total	2110	149	2380	82.2	1.0
		Nickel, Total	52.0	9.3	47.7	89.5	1.0
		Lead, Total	44.7	3.1	47.7	87.2	1.0
		Antimony, Total	37.2	0.29u	47.7	78.0	1.0
		Selenium, Total	140	0.57u	191	73.5	1.0
		Silicon, Total	2800	2900	95.4	-100. *	1.0
		Vanadium, Total	65.5	22.0	47.7	91.2	1.0
		Zinc, Total	124	81.6	47.7	88.5	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J16358	Mercury, Total	0.02	0.00u	~~NC~~ 200	1.0

JW 2/26/08

corrected value

000031

000000016

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD		DILUTION FACTOR(REP)
-003REP	J16359	Silver, Total	0.1 u	0.1 u	NC		1.0
		Aluminum, Total	4170	4660	10.9		1.0
		Arsenic, Total	2.2	1.9	14.6		1.0
		Boron, Total	1.4	1.3	7.4		1.0
		Barium, Total	32.9	34.6	5.0		1.0
		Beryllium, Total	0.13	0.14	5.5		1.0
		Calcium, Total	2990	3080	3.0		1.0
		Cadmium, Total	0.07	0.06	8.8		1.0
		Cobalt, Total	4.1	4.3	4.8		1.0
		Chromium, Total	7.0	7.8	10.8		1.0
		Copper, Total	14.4	14.3	0.70		1.0
		Iron, Total	9920	10800	8.4		1.0
		Potassium, Total	520	673	25.7		1.0
		Magnesium, Total	2940	3290	11.4		1.0
		Manganese, Total	188	219	15.1		1.0
		Molybdenum, Total	0.29u	0.41	~~NC~~	200 corrected value [illegible] 2/26/08	1.0
		Sodium, Total	149	138	7.9		1.0
		Nickel, Total	9.3	9.4	1.1		1.0
		Lead, Total	3.1	3.0	3.3		1.0
		Antimony, Total	0.29u	0.29u	NC		1.0
		Selenium, Total	0.57u	0.57u	NC		1.0
		Silicon, Total	2900	2420	18.0		1.0
		Vanadium, Total	22.0	24.4	10.3		1.0
		Zinc, Total	81.6	88.0	7.5		1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/25/08

CLIENT: TNUHANFORD RC-029 K1091 LVL LOT #: 0802L582

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0067-LC1	Silver, LCS	46.4	50.0	MG/KG	92.8
		Aluminum, LCS	469	500	MG/KG	93.9
		Arsenic, LCS	891	1000	MG/KG	89.1
		Boron, LCS	455	500	MG/KG	91.0
		Barium, LCS	466	500	MG/KG	93.3
		Beryllium, LCS	23.3	25.0	MG/KG	93.2
		Calcium, LCS	2350	2500	MG/KG	94.0
		Cadmium, LCS	23.0	25.0	MG/KG	92.0
		Cobalt, LCS	234	250	MG/KG	93.6
		Chromium, LCS	46.8	50.0	MG/KG	93.6
		Copper, LCS	120	125	MG/KG	95.6
		Iron, LCS	468	500	MG/KG	93.6
		Potassium, LCS	2200	2500	MG/KG	87.9
		Magnesium, LCS	2290	2500	MG/KG	91.7
		Manganese, LCS	71.1	75.0	MG/KG	94.8
		Molybdenum, LCS	450	500	MG/KG	90.0
		Sodium, LCS	2280	2500	MG/KG	91.1
		Nickel, LCS	186	200	MG/KG	92.9
		Lead, LCS	234	250	MG/KG	93.6
		Antimony, LCS	273	300	MG/KG	91.0
		Selenium, LCS	862	1000	MG/KG	86.2
		Silicon, LCS	437	500	MG/KG	87.4
		Vanadium, LCS	233	250	MG/KG	93.1
		Zinc, LCS	92.3	100	MG/KG	92.3
LCS1	08C0036-LC1	Mercury, LCS	5.1	4.7	MG/KG	107.8

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/30/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0035-MB1	Silver, TCLP Leachate	1.0	u	UG/L	1.0	1.0
		Arsenic, TCLP Leachate	5.0	u	UG/L	5.0	1.0
		Barium, TCLP Leachate	1.0	u	UG/L	1.0	1.0
		Cadmium, TCLP Leachate	0.50	u	UG/L	0.50	1.0
		Chromium, TCLP Leachate	2.0	u	UG/L	2.0	1.0
		Lead, TCLP Leachate	3.2		UG/L	3.0	1.0
		Selenium, TCLP Leachate	6.0	u	UG/L	6.0	1.0
BLANK2	08L0035-MB2	Silver, TCLP Leachate	6.7		UG/L	6.0	6.0
		Arsenic, TCLP Leachate	30.0	u	UG/L	30.0	6.0
		Barium, TCLP Leachate	6.0	u	UG/L	6.0	6.0
		Cadmium, TCLP Leachate	3.0	u	UG/L	3.0	6.0
		Chromium, TCLP Leachate	12.0	u	UG/L	12.0	6.0
		Lead, TCLP Leachate	20.0		UG/L	18.0	6.0
		Selenium, TCLP Leachate	36.0	u	UG/L	36.0	6.0
BLANK1	08C0017-MB1	Mercury, Total	0.06	u	UG/L	0.06	1.0
BLANK2	08C0017-MB2	Mercury, TCLP Leachate	0.12		UG/L	0.06	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/30/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	J16375	Silver, TCLP Leachate	4400	6.0 u	5000	87.9	6.0
		Arsenic, TCLP Leachate	4730	30.0 u	5000	94.5	6.0
		Barium, TCLP Leachate	91400	46.2	100000	91.3	6.0
		Cadmium, TCLP Leachate	975	3.0 u	1000	97.5	6.0
		Chromium, TCLP Leachat	4860	12.0 u	5000	97.2	6.0
		Mercury, TCLP Leachate	198	0.06u	200	98.9	50.0
		Lead, TCLP Leachate	4910	18.0 u	5000	98.2	6.0
		Selenium, TCLP Leachat	927	36.0 u	1000	92.7	6.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/30/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-004REP	J16375	Silver, TCLP Leachate	6.0 u	6.8	* NC 200	6.0
		Arsenic, TCLP Leachate	30.0 u	30.0 u	NC	6.0
		Barium, TCLP Leachate	46.2	41.2	11.4	6.0
		Cadmium, TCLP Leachate	3.0 u	3.0 u	NC	6.0
		Chromium, TCLP Leachate	12.0 u	12.0 u	NC	6.0
		Mercury, TCLP Leachate	0.06u	0.06u	NC	1.0
		Lead, TCLP Leachate	18.0 u	31.4	* NC 200	6.0
		Selenium, TCLP Leachate	36.0 u	36.0 u	NC	6.0

* corrected values
MW 1/30/08

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/30/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0035-LC1	Silver, LCS	482	500	UG/L	96.3
		Arsenic, LCS	9540	10000	UG/L	95.4
		Barium, LCS	4760	5000	UG/L	95.1
		Cadmium, LCS	250	250	UG/L	99.9
		Chromium, LCS	495	500	UG/L	99.0
		Lead, LCS	2500	2500	UG/L	99.9
		Selenium, LCS	9210	10000	UG/L	92.1
LCS1	08C0017-LC1	Mercury, LCS	5.0	5.0	UG/L	100.7

Date: 21 March 2008
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil – Waste Subsite 100-F-44:2
Subject: Wet Chemistry - Data Package No. K1091-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K1091 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
J16358	1/16/08	Soil	C	See note 1
J16359	1/16/08	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".

Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

All other 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 (J16358/J16359) 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 K1091 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiency was noted:

- Due to the holding time being exceeded by less than twice the limit, all petroleum hydrocarbon results were qualified as estimates and flagged "J".

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

All 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: K1091	REVIEWER: ELR	Project: 100-F-44:2	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Petroleum hydrocarbons	J	All	Holding time

* - 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 02/08/08

CLIENT: TNUHANFORD RC-029 K1091
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0801L468

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J16358	% Solids	98.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	134 u J	MG/KG	134	1.0
-003	J16359	% Solids	98.9	%	0.01	1 0
		Chromium VI	0.28	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	134 u J	MG/KG	134	1.0

K
3/20/08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029 K1091
LVL#: 0801L468

W.O.#: 11343-606-001-9999-00
Date Received: 01-18-08

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 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. The duplicate LCS for Petroleum Hydrocarbon (PHC) was within the 20% Relative Percent Difference (RPD) control limit.

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

8. The replicate analyses for Chromium VI, Percent Solids and PHC were within the 20% 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.

Judy Stone
Ian Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/13/08
Date

njp\01-468
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 12 pages.

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

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD RC-029 K1091

RECEIVED FEB 2008

DATE RECEIVED: 01/18/08 LVL LOT # :08[illegible]L468

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16375						
TCLP	001	S	08LTO010	01/16/08	01/23/08	01/24/08
J16358						
% SOLIDS	002	S	08L%S008	01/16/08	01/21/08	01/22/08
CHROMIUM VI	002	S	08LVI007	01/16/08	01/22/08	01/22/08
CHROMIUM VI	002 REP	S	08LVI007	01/16/08	01/22/08	01/22/08
CHROMIUM VI	002 MS	S	08LVI007	01/16/08	01/22/08	01/22/08
CHROMIUM VI	002 MSD	S	08LVI007	01/16/08	01/22/08	01/22/08
PETROLEUM HYDROCARBO	002	S	08LHC002	01/16/08	02/04/08	02/08/08
TCLP	002	S	08LTO010	01/16/08	01/23/08	01/24/08
J16359						
% SOLIDS	003	S	08L%S008	01/16/08	01/21/08	01/22/08
% SOLIDS	003 REP	S	08L%S008	01/16/08	01/21/08	01/22/08
CHROMIUM VI	003	S	08LVI007	01/16/08	01/22/08	01/22/08
PETROLEUM HYDROCARBO	003	S	08LHC002	01/16/08	02/04/08	02/08/08
PETROLEUM HYDROCARBO	003 REP	S	08LHC002	01/16/08	02/04/08	02/08/08
PETROLEUM HYDROCARBO	003 MS	S	08LHC002	01/16/08	02/04/08	02/08/08
TCLP	003	S	08LTO010	01/16/08	01/23/08	01/24/08
AB QC:						
CHROMIUM VI	MB1	S	08LVI007	N/A	01/22/08	01/22/08
CHROMIUM VI	MB1 BS	S	08LVI007	N/A	01/22/08	01/22/08
CHROMIUM VI	MB1 BSD	S	08LVI007	N/A	01/22/08	01/22/08
PETROLEUM HYDROCARBO	MB1	S	08LHC002	N/A	02/04/08	02/08/08
PETROLEUM HYDROCARBO	MB1 BS	S	08LHC002	N/A	02/04/08	02/08/08
PETROLEUM HYDROCARBO	MB1 BSD	S	08LHC002	N/A	02/04/08	02/08/08

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
Welch-Koelling	Matt Perrott	372-9088	KESSNER, JH	8C	15 Days

Project Designation	Sampling Location	SAF No.
Remaining Sites Confirmation Sampling - Soil	~~100-F-16~~ 100-F-44-2 BH 1/16/08	RC-029

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-505	EL-1601-2	C00F44A000 ~~C00F46A000~~ BH 1/16/08	FedEx

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
BH 1/16/08 ~~EBERLINE SERVICES~~ (LIONVILLE)	A080176	See BSPC

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	G/P	aG	aG	G	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	60mL	60mL	120mL	250mL	250mL	250mL	250mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081	PAHs - 8310	TPH (Total) - 418.1	See item (2)		

Sample No.	Matrix *	Sample Date	Sample Time									
~~J16355~~ BH 1/16/08	SOIL											
J16356	SOIL											
~~J16357~~ J16375	SOIL	1/16/08	1330								X	
J16358	SOIL	1/16/08	1350			X	X	X		X		
J16359	SOIL	1/16/08	1352			X	X	X		X		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	[illegible]	1/16/08 1430	BHudson BHudson	1/16/08 1430
Relinquished By/Removed From	BHudson BHudson	1/16/08 1515	3728 #2C	1/16/08 1515
Relinquished By/Removed From	3728 #2C	1-17-08 0830	KMSingleton	1-17-08 0830
Relinquished By/Removed From	KMSingleton	1-17-08 WCH 1500	FED EX	
Relinquished By/Removed From	FED EX	1-18-09 0950	[illegible]	1-18-09 0950
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

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

samples from 3728 Ref # RC
3728 Custodian removed samples for shipping on 1/17/08.
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

000014

000000011

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-44;2			DATA PACKAGE: K1091		
VALIDATOR: ELR		LAB: LLI		DATE: 3/17/08	
			SDG: K1091		

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
J16358 J16359
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 Pet hydrocarbons ana

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/08/08

CLIENT: TNUHANFORD RC-029 X1091

LVL LOT #: 08011468

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	08LVI007-MB1	Chromium VI	0.20	u	MG/KG	0.20	1.0
BLANK10	08LHC002-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/08/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J16358	Soluble Chromium VI	4.1	0.20u	4.0	97 7	1.0
		Insoluble Chromium VI	1240	0.20u	1110	111.3	100
-003	J16359	Petroleum Hydrocarbons	556	0.0	565	98.4	1.0
BLANK10	08LVI007-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.5	1.0
		Insoluble Chromium VI	1110	0.20u	1080	103.2	100
BLANK10	08LHC002-MB1	Petroleum Hydrocarbons	567	133 u	560	101.3	1.0
		Petroleum Hydrocarbons	562	133 u	559	100.6	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 02/08/08

CLIENT: TNUHANFORD RC-029 K1091

LVL LOT #: 0801L468

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	08LHC002-MB1	Petroleum Hydrocarbons	101.3	100.6	0.70