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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 MJP 03/13/06
INITIAL/DATE

COMMENTS:

SDG K0107 SAF-RC-029

Waste Site: 100-D-50:6

RECEIVED
MAR 2 1 2006
EDMC

Date: 1 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil –Waste Site 100-D-50:6
Subject: Wet Chemistry - Data Package No. K0107-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0107 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	Date
J10L62	11/9/05	Soil	C	See note 1
J10L63	11/9/05	Soil	C	See note 1
J10L71	11/9/05	Soil	C	See note 1

1 – Chromium VI by 7196A.

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. Qualified Data Summary and 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.

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10L62/J10L63) were submitted for analysis. Field duplicates are analyzed 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 analytes met the RQL.

- **Completeness**

Data package K0107 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 BHI 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: K01107	REVIEWER: [illegible]	Project: 100-D-50-6	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

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD							
Lab: LLI	SDG: K0107						
Sample Number		J10L62		J10L63		J10L71	
Remarks				Duplicate			
Sample Date		11/9/05		11/9/05		11/9/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.23		0.36		0.24	

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/18/05

CLIENT: TNU-HANFORD RC-029 K0107

LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10L62	% Solids	98.3	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.20	1.0
-002	J10L63	% Solids	98.2	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.20	1.0
-003	J10L71	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.24	MG/KG	0.21	1.0
-004	J10L72	% Solids	99.9	%	0.01	1.0

R 2/23/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029 K0107
LVL#: 0511L700

W.O.#: 11343-606-001-9999-00
Date Received: 11-11-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

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

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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 blank for Chromium VI was within the method criteria.

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

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

8. The replicate analysis for Chromium VI was outside the 20% Relative Percent Difference (RPD) control limit that may be attributed to sample inhomogeneity.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/23/05
Date

njp\i11-700

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-016	Page 1 of 1

Collector: STANKOVICH/HUDSON	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-D-50:6	SAF No.: RC-029	Air Quality ☐
Ice Chest No.: AFS-04-017	Field Logbook No.: EL-1578-7	COA: C10DR16700	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A060113		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad

Special Handling and/or Storage

Cool 4°C

N DAS 11/10/05

00013

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G/P A	G/P B	aG	G						
No. of Container(s)	BH	1	1	BH	BH 11/9/05						
Volume	11/9/05	250mL	120mL	250mL	250mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1						

	Sample No.	Matrix *	Sample Date	Sample Time										
1	~~J10L69~~ J10L62	SOIL	11/9/05	1000		X	X							
2	~~J10L70~~ J10L63	SOIL	11/9/05	1000		X	X							
3	J10L71	SOIL	11/9/05	1045		X	X							
4	J10L72	SOIL	11/9/05	1030		X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: M Stankovich	11/9/05 1400	Received By/Stored In: 3728/2C	11/9/05 1400
Relinquished By/Removed From: 3728 Ref 2C	11/10/05 1200	Received By/Stored In: D Sanjohn	11/10/05 1200
Relinquished By/Removed From: D Sanjohn	11/10/05 1200	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	11/11/05 0915	Received By/Stored In:	11/11/05 0915
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 – Total Sr; Technetium-99; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Total Uranium
(2) ICP Metals - 6010TR (SW846) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *
S=Soil
SS=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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-50:6		DATA PACKAGE:	K0107	
VALIDATOR:	TCI	LAB:	LLI	DATE:	2/19/06
			SDG:	K0107	

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
J10L62 J10L63 J10L71
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:

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 DAS

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/18/05

CLIENT: TNU-HANFORD RC-029 26107 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI079-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/18/05

CLIENT: TNU-HANFORD RC-029 K0107 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	J10L71	Soluble Chromium VI	4.3	0.24	4.2	96.4	1.0
		Insoluble Chromium VI	1290	0.24	1230	104.8	100
BLANK10	05LVI079-MB1	Soluble Chromium VI	3.9	0.20u	4.0	97.7	1.0
		Insoluble Chromium VI	1320	0.20u	1170	113.0	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/18/05

CLIENT: TNU-HANFORD RC-029 K0107

LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-003REP	J10L71	Chromium VI	0.24	0.21u	~~NC~~ 63.0	1.0

Date: 1 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-50:6
Subject: Inorganics - Data Package No. K0107-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0107 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	Date
J10L62	11/9/05	Soil	C	See note 1
J10L63	11/9/05	Soil	C	See note 1
J10L71	11/9/05	Soil	C	See note 1
J10L72	11/9/05	Soil	C	See note 1

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

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

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
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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 "U". 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 and zinc results in sample J10L72 were qualified as undetected and flagged "UJ".

Due to method blank contamination, all molybdenum results were qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J10L72) was submitted for analysis. Aluminum, barium, chromium, iron, potassium, manganese, magnesium, sodium, and silicon were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery

of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a MS recovery outside QC limits (60.6%), all calcium results were qualified as estimates and flagged "J".

Due to a MS recovery outside QC limits (44%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (48.2%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

Due to an RPD outside QC limits (31.3%), all chromium results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10L62/J10L63) were submitted for analysis. Field duplicates are assessed 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 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K0107 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the calcium and zinc results in sample J10L72 were qualified as undetected and flagged "UJ".
- Due to method blank contamination, all molybdenum results were qualified as undetected and flagged "UJ".
- Due to a MS recovery outside QC limits (60.6%), all calcium results were qualified as estimates and flagged "J".
- Due to a MS recovery outside QC limits (44%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (48.2%), all silicon results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (31.3%), all chromium results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI 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

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 BHI 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 K0107	REVIEWER TLL	Project 100-D-50:6	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Zinc	UJ	J10L72	Blank contamination
Molybdenum	UJ	All	Blank contamination
Calcium Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery
Chromium	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD									
Lab: LLI	SDG: K0107								
Sample Number		J10L62		J10L63		J10L71		J10L72	
Remarks				Duplicate				E. Blank	
Sample Date		11/9/05		11/9/05		11/9/05		11/9/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.14	U	0.14	U	0.14	U	0.13	U
Aluminum		6040		5390		4830		35.3	
Arsenic	10	3.9		3.7		2.5		0.33	U
Boron		1.1		1.1		1.1		0.26	U
Barium	2	60.1		56.7		65.3		0.97	
Beryllium		0.24		0.21		0.23		0.01	U
Calcium		9290	J	8510	J	7530	J	20.2	UJ
Cadmium	0.2	0.12		0.14		0.07		0.07	U
Cobalt		5.7		5.6		7.1		0.12	U
Chromium	1	13.3	J	10.7	J	7.1	J	0.18	J
Copper		13.7		12.3		13.7		0.12	U
Iron		15900		14700		19800		200	
Mercury	0.2	0.01	U	0.02	U	0.01	U	0.02	U
Potassium		1140		1020		846		16.5	
Magnesium		4840		4400		4010		6.2	
Manganese		279		262		270		3.7	
Molybdenum		0.42	UJ	0.47	UJ	0.46	UJ	0.16	UJ
Sodium		197		183		196		6.0	
Nickel		12.2		11.0		8.7		0.13	U
Lead	5	3.8		3.8		4.4		0.30	U
Antimony		0.39	UJ	0.40	UJ	0.40	UJ	0.38	UJ
Selenium	1	0.35	U	0.36	U	0.36	U	0.35	U
Silicon		414	J	586	J	376	J	43.1	J
Vanadium		32.6		28.8		48.6		0.09	U
Zinc	1	35.1		32.7		39.2		0.96	UJ

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 R0107

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

LVL LOT #: 0511L700

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10L62	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	6040	MG/KG	1.8	1.0
		Arsenic, Total	3.9	MG/KG	0.33	1.0
		Boron, Total	1.1	MG/KG	0.26	1.0
		Barium, Total	60.1	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.01	1.0
		Calcium, Total	9290 J	MG/KG	1.2	1.0
		Cadmium, Total	0.12	MG/KG	0.07	1.0
		Cobalt, Total	5.7	MG/KG	0.12	1.0
		Chromium, Total	13.3 J	MG/KG	0.16	1.0
		Copper, Total	13.7	MG/KG	0.12	1.0
		Iron, Total	15900	MG/KG	3.1	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1140	MG/KG	5.4	1.0
		Magnesium, Total	4840	MG/KG	1.3	1.0
		Manganese, Total	279	MG/KG	0.02	1.0
		Molybdenum, Total	0.42 UJ	MG/KG	0.13	1.0
		Sodium, Total	197	MG/KG	0.17	1.0
		Nickel, Total	12.2	MG/KG	0.13	1.0
		Lead, Total	3.8	MG/KG	0.30	1.0
		Antimony, Total	0.39 u J	MG/KG	0.39	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Silicon, Total	414 J	MG/KG	0.80	1.0
		Vanadium, Total	32.6	MG/KG	0.09	1.0
		Zinc, Total	35.1	MG/KG	0.05	1.0

2/23/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10L63	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	5390	MG/KG	1.8	1.0
		Arsenic, Total	3.7	MG/KG	0.34	1.0
		Boron, Total	1.1	MG/KG	0.27	1.0
		Barium, Total	56.7	MG/KG	0.02	1.0
		Beryllium, Total	0.21	MG/KG	0.01	1.0
		Calcium, Total	8510 J	MG/KG	1.2	1.0
		Cadmium, Total	0.14	MG/KG	0.07	1.0
		Cobalt, Total	5.6	MG/KG	0.12	1.0
		Chromium, Total	10.7 J	MG/KG	0.16	1.0
		Copper, Total	12.3	MG/KG	0.12	1.0
		Iron, Total	14700	MG/KG	3.2	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1020	MG/KG	5.5	1.0
		Magnesium, Total	4400	MG/KG	1.3	1.0
		Manganese, Total	262	MG/KG	0.02	1.0
		Molybdenum, Total	0.470 J	MG/KG	0.13	1.0
		Sodium, Total	183	MG/KG	0.17	1.0
		Nickel, Total	11.0	MG/KG	0.13	1.0
		Lead, Total	3.8	MG/KG	0.31	1.0
		Antimony, Total	0.40 u J	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	586 J	MG/KG	0.81	1.0
		Vanadium, Total	28.8	MG/KG	0.09	1.0
		Zinc, Total	32.7	MG/KG	0.05	1.0

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2/25/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J10L71	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4830	MG/KG	1.8	1.0
		Arsenic, Total	2.5	MG/KG	0.34	1.0
		Boron, Total	1.1	MG/KG	0.27	1.0
		Barium, Total	65.3	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.01	1.0
		Calcium, Total	7530 J	MG/KG	1.2	1.0
		Cadmium, Total	0.07	MG/KG	0.07	1.0
		Cobalt, Total	7.1	MG/KG	0.12	1.0
		Chromium, Total	7.1 J	MG/KG	0.16	1.0
		Copper, Total	13.7	MG/KG	0.12	1.0
		Iron, Total	19800	MG/KG	3.2	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	846	MG/KG	5.6	1.0
		Magnesium, Total	4010	MG/KG	1.4	1.0
		Manganese, Total	270	MG/KG	0.02	1.0
		Molybdenum, Total	0.46 UJ	MG/KG	0.13	1.0
		Sodium, Total	196	MG/KG	0.17	1.0
		Nickel, Total	8.7	MG/KG	0.13	1.0
		Lead, Total	4.4	MG/KG	0.21	1.0
		Antimony, Total	0.40 u J	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	376 J	MG/KG	0.82	1.0
		Vanadium, Total	48.6	MG/KG	0.09	1.0
		Zinc, Total	39.2	MG/KG	0.05	1.0

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2/25/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10L72	Silver, Total	0.13 u	MG/KG	0.13	1.0
		Aluminum, Total	35.3	MG/KG	1.8	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Boron, Total	0.26 u	MG/KG	0.26	1.0
		Barium, Total	0.97	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	20.2 UJ	MG/KG	1.1	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.18 J	MG/KG	0.15	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	200	MG/KG	3.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	16.5	MG/KG	5.3	1.0
		Magnesium, Total	6.2	MG/KG	1.3	1.0
		Manganese, Total	3.7	MG/KG	0.02	1.0
		Molybdenum, Total	0.16 UJ	MG/KG	0.13	1.0
		Sodium, Total	6.0	MG/KG	0.16	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.38 u J	MG/KG	0.38	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Silicon, Total	43.1 J	MG/KG	0.79	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.96 UJ	MG/KG	0.05	1.0

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2/25/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0511L700
SDG/SAF#: K0107/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 11-11-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 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 results presented in this report are derived from samples that met LvLI's sample acceptance policy.

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

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

7. The preparation/method blanks for 3 analytes were outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The MB results for Calcium, Sodium, and Zinc were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J10L72 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.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 48.2%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

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 21 pages.

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

10. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. 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
J10L62	Aluminum	20,000	108.9
	Calcium	20,000	65.6
	Iron	20,000	141.5
	Manganese	2,000	81.9
	Antimony	100	96.3
	Silicon	2,100	91.2

12. The duplicate analyses for 5 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. 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

11/22/05
Date

jjw/m11-700

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-016	Page 1 of 1

Collector: STANKOVICH/HUDSON	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-D-50:6	SAF No.: RC-029	
Ice Chest No.: AFS-04-017	Field Logbook No.: EL-1578-7	COA: C10DR16700	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060113	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad

Special Handling and/or Storage

Cool 4°C

DAS 11/10/05

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G/P A	G/P B	aG	G						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	250mL	120mL	250mL	250mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270 (TCL)	TPH (Total) - 418.1						
Sample No. / Matrix * / Sample Date / Sample Time											
~~J10L60~~ J10L62 / SOIL / 11/9/05 / 1000		X	X								
~~J10L70~~ J10L63 / SOIL / 11/9/05 / 1000		X	X								
J10L71 / SOIL / 11/9/05 / 1045		X	X								
J10L72 / SOIL / 11/9/05 / 1030		X									

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	M Stankovich	11/9/05 1400	3728/2C	11/9/05 1400
Relinquished By/Removed From	3728 Ref2C	11/10/05 1200	P Kruger	11/10/05 1200
Relinquished By/Removed From	P Kruger	11/10/05 1200	Fed Ex	
Relinquished By/Removed From	Fed Ex	11/11/05 0915		11/11/05 0915
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium {Plutonium-238, Plutonium-239/240}; Strontium-89,90 -- Total Sr; Technetium-99; Isotopic Uranium {Uranium-233/234; Uranium-235, Uranium-238}; Total Uranium
(2) ICP Metals - 6010TR (SW846) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)

Matrix *: S=Soil, SE=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solid, DL=Drum Liq, 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

BHI-EE-011 (08/29/2005)

000019

0000000020

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-D-50:6			DATA PACKAGE: K0107		
VALIDATOR: TLI		LAB: LLI		DATE: 2/20/06	
			SDG: K0107		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10L62	J10L63	J10L71	J10L72		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: Calcium Zinc -72 > UJ
mdly - all

FB - al, Barium, chromium, iron, potassium magnesium, manganese
Sodium & 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: Calcium - 60.62 J all MS n = PA
antimony - 4470 J all "

LCS Silica - 4912 - J all

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: Chromium - 31.32o - J all

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

Rresults 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 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0665-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	1.8 u	MG/KG	1.8	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.04	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	4.8	MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.2 u	MG/KG	3.2	1.0
		Potassium, Total	5.5 u	MG/KG	5.5	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.06	MG/KG	0.02	1.0
		Molybdenum, Total	0.13	MG/KG	0.13	1.0
		Sodium, Total	1.2	MG/KG	0.17	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	0.82 u	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.25	MG/KG	0.05	1.0
BLANK1	05C0271-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J10L62	Silver, Total	4.8	0.14u	4.9	98.0	1.0
		Aluminum, Total	6130	6040	196	50.6*	1.0
		Arsenic, Total	188	3.9	196	94.2	1.0
		Boron, Total	89.1	1.1	97.8	90.0	1.0
		Barium, Total	244	60.1	196	93.8	1.0
		Beryllium, Total	4.9	0.24	4.9	95.0	1.0
		Calcium, Total	10800	9290	2440	60.6	1.0
		Cadmium, Total	4.7	0.12	4.9	93.4	1.0
		Cobalt, Total	51.2	5.7	48.9	93.0	1.0
		Chromium, Total	29.7	13.3	19.6	83.7	1.0
		Copper, Total	37.6	13.7	24.4	98.0	1.0
		Iron, Total	14500	15900	97.8	-1300. *	1.0
		Mercury, Total	0.14	0.01u	0.14	101.4	1.0
		Potassium, Total	3370	1140	2440	91.2	1.0
		Magnesium, Total	6890	4840	2440	83.8	1.0
		Manganese, Total	303	279	48.9	50.5*	1.0
		Molybdenum, Total	91.6	0.42	97.8	93.2	1.0
		Sodium, Total	2520	197	2440	95.2	1.0
		Nickel, Total	56.2	12.2	48.9	90.0	1.0
		Lead, Total	49.7	3.8	48.9	93.9	1.0
		Antimony, Total	21.5	0.39u	48.9	44.0	1.0
		Selenium, Total	177	0.35u	196	90.3	1.0
		Silicon, Total	730	414	97.8	323.4*	1.0
		Vanadium, Total	75.0	32.6	48.9	86.7	1.0
		Zinc, Total	78.7	35.1	48.9	89.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J10L62	Silver, Total	0.14u	0.14u	NC	1.0
		Aluminum, Total	6040	4970	19.4	1.0
		Arsenic, Total	3.9	3.5	10.8	1.0
		Boron, Total	1.1	0.69	45.5	1.0
		Barium, Total	60.1	54.4	10	1.0
		Beryllium, Total	0.24	0.21	14.6	1.0
		Calcium, Total	9290	8140	13.2	1.0
		Cadmium, Total	0.12	0.10	16.3	1.0
		Cobalt, Total	5.7	5.0	13.1	1.0
		Chromium, Total	13.3	9.7	31.3	1.0
		Copper, Total	13.7	12.1	12.4	1.0
		Iron, Total	15900	13300	17.9	1.0
		Mercury, Total	0.01u	0.02u	NC	1.0
		Potassium, Total	1140	1020	11.2	1.0
		Magnesium, Total	4840	4110	16.2	1.0
		Manganese, Total	279	246	12.6	1.0
		Molybdenum, Total	0.42	0.48	12.4	1.0
		Sodium, Total	197	159	21.7	1.0
		Nickel, Total	12.2	10.0	19.8	1.0
		Lead, Total	3.8	3.4	11.1	1.0
		Antimony, Total	0.39u	0.39u	NC	1.0
		Selenium, Total	0.35u	0.35u	NC	1.0
		Silicon, Total	414	523	23.2	1.0
		Vanadium, Total	32.6	25.1	26.0	1.0
		Zinc, Total	35.1	30.2	15.0	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/21/05

CLIENT: TNU-HANFORD RC-029 LVL LOT #: 0511L700

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0665-LC1	Silver, LCS	49.3	50.0	MG/KG	98.6
		Aluminum, LCS	488	500	MG/KG	97.6
		Arsenic, LCS	975	1000	MG/KG	97.5
		Boron, LCS	478	500	MG/KG	95.5
		Barium, LCS	489	500	MG/KG	97.8
		Beryllium, LCS	24.3	25.0	MG/KG	97.2
		Calcium, LCS	2460	2500	MG/KG	98.4
		Cadmium, LCS	24.5	25.0	MG/KG	98.0
		Cobalt, LCS	247	250	MG/KG	98.6
		Chromium, LCS	49.9	50.0	MG/KG	99.8
		Copper, LCS	124	125	MG/KG	99.6
		Iron, LCS	497	500	MG/KG	99.5
		Potassium, LCS	2350	2500	MG/KG	93.8
		Magnesium, LCS	2410	2500	MG/KG	96.4
		Manganese, LCS	75.8	75.0	MG/KG	101.1
		Molybdenum, LCS	499	500	MG/KG	99.7
		Sodium, LCS	2350	2500	MG/KG	93.8
		Nickel, LCS	194	200	MG/KG	97.2
		Lead, LCS	243	250	MG/KG	97.4
		Antimony, LCS	292	300	MG/KG	97.2
		Selenium, LCS	931	1000	MG/KG	93.1
		Silicon, LCS	241	500	MG/KG	48.2
		Vanadium, LCS	245	250	MG/KG	98.2
		Zinc, LCS	96.9	100	MG/KG	96.9
LCS1	05C0271-LC1	Mercury, LCS	6.7	6.2	MG/KG	107.8

Date: 1 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-50:6
Subject: Radiochemistry - Data Package No. K0107-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0107 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	Date
J10L62	11/9/05	Soil	C	See note 1
J10L63	11/9/05	Soil	C	See note 1
J10L71	11/9/05	Soil	C	See note 1

1 – Gross alpha/beta, total uranium and gamma spectroscopy.

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

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and 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 duplicate samples (J10L62/J10L63) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for gross beta (40%) and potassium-40 (31%) were outside QC limits. Under the WCH statement of work, no qualification is required. All other 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. Six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0107 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

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

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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 BHI 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: K0107	REVIEWER: TLL	Project: 100-D-50-6	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

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD							
Laboratory: EB	SDG: K0107						
Sample Number		J10L62		J10L63		J10L71	
Remarks				Duplicate			
Sample Date		11/9/05		11/9/05		11/9/05	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q
Gross Alpha		7.98		10.9		8.68	
Gross Beta		22.4		33.7		22.3	
Total uranium (ug/g)	1	1.27		1.66		1.49	
Potassium-40		14.2		10.4		9.16	
Cobalt 60	0.05	U	U	U	U	U	U
Cesium 137	0.05	U	U	U	U	U	U
Radium-226		0.503		0.484		0.381	
Radium-228		0.535		0.781		0.509	
Europium 152	0.1	U	U*	U	U*	U	U
Europium 154	0.1	U	U*	U	U*	U	U*
Europium 155	0.1	U	U	U	U*	U	U
Thorium-228		0.868		0.781		0.616	
Thorium-232		0.535		U	U	0.509	
Uranium-235(gea)		U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U

000010

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-001 J10L62

DATA SHEET

SDG	7776	Client/Case no	Hanford	SDG K0107	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511158-01	Client sample id	J10L62		
Dept sample id	7776-001	Location/Matrix	100-D-50:6	SOLID	
Received	11/14/05	Collected/Weight	11/09/05 10:00	1154 g	
% solids	98.1	Custody/SAF No	RC-029-016	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.98	3.8	3.8	10		93A
Gross Beta	12587-47-2	22.4	4.5	5.5	15		93B
Total Uranium (ug/g)	7440-61-1	1.27	0.14	0.019	1.0		U_T
Potassium 40	13966-00-2	14.2	1.2	0.28			GAM
Cobalt 60	10198-40-0	U		0.050	0.050	U	GAM
Cesium 137	10045-97-3	U		0.041	0.10	U	GAM
Radium 226	13982-63-3	0.503	0.084	0.080	0.10		GAM
Radium 228	15262-20-1	0.535	0.16	0.19	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.15	0.10	U	GAM
Europium 155	14391-16-3	U		0.089	0.10	U	GAM
Thorium 228	14274-82-9	0.868	0.070	0.063			GAM
Thorium 232	TH-232	0.535	0.16	0.19			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		5.4		U	GAM
Americium 241	14596-10-2	U		0.059		U	GAM

Remaining Sites Confirmation Smplg.

RL 2/23/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/05/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-002 J10L63

DATA SHEET

SDG	7776	Client/Case no	Hanford	SDG K0107	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511158-02	Client sample id	J10L63		
Dept sample id	7776-002	Location/Matrix	100-D-50:6	SOLID	
Received	11/10/05	Collected/Weight	11/09/05 10:00	1306 g	
% solids	98.0	Custody/SAF No	RC-029-016	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	10.9	4.2	3.7	10		93A
Gross Beta	12587-47-2	33.7	6.1	7.8	15		93B
Total Uranium (ug/g)	7440-61-1	1.66	0.19	0.019	1.0		U_T
Potassium 40	13966-00-2	10.4	0.59	0.34			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Cesium 137	10045-97-3	U		0.035	0.10	U	GAM
Radium 226	13982-63-3	0.484	0.080	0.066	0.10		GAM
Radium 228	15262-20-1	0.781	0.16	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Thorium 228	14274-82-9	U		0.091		U	GAM
Thorium 232	TH-232	0.781	0.16	0.14			GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		4.2		U	GAM
Americium 241	14596-10-2	U		0.18		U	GAM

Remaining Sites Confirmation Smplg.

2/25/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/05/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-003 J10L71

DATA SHEET

SDG	7776	Client/Case no	Hanford		SDG_K0107
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511158-03	Client sample id	J10L71		
Dept sample id	7776-003	Location/Matrix	100-D-50:6		SOLID
Received	11/10/05	Collected/Weight	11/09/05 10:45	1395 g	
% solids	96.0	Custody/SAF No	RC-029-016	RC-029	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	8.68	3.9	4.0	10		93A
Gross Beta	12587-47-2	22.3	4.7	5.8	15		93B
Total Uranium (ug/g)	7440-61-1	1.49	0.17	0.019	1.0		U_T
Potassium 40	13966-00-2	9.16	0.74	0.26			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.381	0.062	0.057	0.10		GAM
Radium 228	15262-20-1	0.509	0.13	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.096	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.069	0.10	U	GAM
Thorium 228	14274-82-9	0.616	0.052	0.047			GAM
Thorium 232	TH-232	0.509	0.13	0.14			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Americium 241	14596-10-2	U		0.044		U	GAM

Remaining Sites Confirmation Smplg.

R 2/25/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/05/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0107 was composed of three solid (soil) samples designated under SAF No. RC-029 with a Project Designation of: Remaining Sites Confirmation Sampling – Soil. The Sampling Location was 100-D-50:6.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 5, 2005.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Total Uranium Analysis

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

12/7/5

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-016	Page 1 of 1

Collector: STANKOVICH/HUDSON	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling - Soil	Sampling Location: 100-D-50:6 K0107 (7776)	SAF No.: RC-029	
Ice Chest No.: SMC-531	Field Logbook No.: EL-1578-7	COA: C10DR16700	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060094	Bill of Lading/Air Bill No.: See DSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS: Non Rad

Special Handling and/or Storage: None

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Preservation	None	None	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G/P	G/P	aG	G						
No. of Container(s)	1	1	1	1	1						
Volume	1000mL	250mL	120mL	250mL	250mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1						

BH 11/9/05

Sample No.	Matrix *	Sample Date	Sample Time									
~~J10L69~~ J10L62	SOIL	11/9/05	1000	X								
~~J10L70~~ J10L63	SOIL	11/9/05	1000	X								
J10L71	SOIL	11/9/05	1045	X								
~~J10L72~~	~~SOIL~~											
	11/7/05											

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: MTL Instaloads	11/9/05 1400	3728/2C	11/9/05 1400
Relinquished By/Removed From: 3728 Ref 2C	11/10/05 1200	D St John	11/10/05 1200
Relinquished By/Removed From: D St John	11/10/05 1200	Fed Ex	
Relinquished By/Removed From: Fed Ex	11/14/05	[illegible]	11/14/05 9:00
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, ~~X~~ Europium-155}; ~~Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238);~~ Total Uranium

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

*Gross Alpha included BH 11/9/05

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-5016		DATA PACKAGE:	K0107	
VALIDATOR:	TZI	LAB:	EB	DATE:	2/20/06
			SDG:	K0107	

ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			

SAMPLES/MATRIX
J10L62 J10L63 J10L71
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: gr beta – 40% no PAS
K-40 – 3%

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: Cover

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-005 **Method Blank**

METHOD BLANK

SDG	7776	Client/Case no	Hanford	SDG K0107	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R511158-05	Client sample id	Method Blank		
Dept sample id	7776-005	Material/Matrix		SOLID	
		SAF No	RC-029		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.47	2.1	3.5	10	U	93A
Gross Beta	12587-47-2	-0.895	3.1	5.5	15	U	93B
Total Uranium (ug/g)	7440-61-1	0	0.008	0.019	1.0	U	U_T
Potassium 40	13966-00-2	U		0.15		U	GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.10	U	GAM
Radium 226	13982-63-3	U		0.025	0.10	U	GAM
Radium 228	15262-20-1	U		0.057	0.20	U	GAM
Europium 152	14683-23-9	U		0.033	0.10	U	GAM
Europium 154	15585-10-1	U		0.044	0.10	U	GAM
Europium 155	14391-16-3	U		0.022	0.10	U	GAM
Thorium 228	14274-82-9	U		0.016		U	GAM
Thorium 232	TH-232	U		0.057		U	GAM
Uranium 235	15117-96-1	U		0.038		U	GAM
Uranium 238	U-238	U		1.7		U	GAM
Americium 241	14596-10-2	U		0.014		U	GAM

Remaining Sites Confirmation Smplg.

QC-BLANK #55112

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/05/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7776

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0107

Contract No. 630

Lab sample id R511158-04

Dept sample id 7776-004

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-029

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	172	16	4.2	10		93A	214	8.6	80	73-127	70-130
Gross Beta	190	10	5.9	15		93B	198	7.9	96	76-124	70-130
Total Uranium (ug/g)	34.2	4.0	0.19	1.0		U_T	33.0	1.3	104	76-124	80-120
Cobalt 60	0.570	0.055	0.029	0.050		GAM	0.562	0.022	101	72-128	80-120
Cesium 137	0.554	0.043	0.029	0.10		GAM	0.559	0.022	99	74-126	80-120

Remaining Sites Confirmation Smplg.

QC-LCS #55111

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 12/05/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0107

7776-006 J10L71

DUPLICATE

SDG	7776			Client/Case no	Hanford SDG K0107
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R511158-06	Lab sample id	R511158-03	Client sample id	J10L71
Dept sample id	7776-006	Dept sample id	7776-003	Location/Matrix	100-D-50:6 SOLID
		Received	11/10/05	Collected/Weight	11/09/05 10:45 1395 g
% solids	96.0	% solids	96.0	Custody/SAF No	RC-029-016 RC-029

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Gross Alpha	7.33	3.5	3.2	10		93A	8.68	3.9	4.0		17	107	0.5
Gross Beta	19.6	4.3	5.4	15		93B	22.3	4.7	5.8		13	56	0.7
Total Uranium (ug/g)	1.46	0.17	0.019	1.0		U_T	1.49	0.17	0.019		2	31	0.2
Potassium 40	10.7	0.60	0.28			GAM	9.16	0.74	0.26		16	35	1.3
Cobalt 60	U		0.080	0.050	U	GAM	U		0.040	U	-		0.9
Cesium 137	U		0.027	0.10	U	GAM	U		0.034	U	-		0.3
Radium 226	0.425	0.060	0.058	0.10		GAM	0.381	0.062	0.057		11	45	0.7
Radium 228	0.642	0.13	0.12	0.20		GAM	0.509	0.13	0.14		23	58	1.2
Europium 152	U		0.066	0.10	U	GAM	U		0.096	U	-		0.5
Europium 154	U		0.10	0.10	U	GAM	U		0.13	U	-		0.4
Europium 155	U		0.11	0.10	U	GAM	U		0.069	U	-		0.6
Thorium 228	0.539	0.034	0.034			GAM	0.616	0.052	0.047		13	36	1.1
Thorium 232	0.642	0.13	0.12			GAM	0.509	0.13	0.14		23	58	1.2
Uranium 235	U		0.13		U	GAM	U		0.11	U	-		0.2
Uranium 238	U		3.5		U	GAM	U		4.3	U	-		0.3
Americium 241	U		0.23		U	GAM	U		0.044	U	-		1.6

Remaining Sites Confirmation Smplg.

QC-DUP#3 55113

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/05/05