SAF-RC-032
100-F Remaining Sites Burial Grounds - Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 MJP 04/05/06
INITIAL/DATE

COMMENTS:

SDG K0211 **SAF-RC-032**

Waste Site: 100-F-31

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EDMC

Date: 4 April 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Sites 100-F-31
Subject: Inorganics - Data Package No. K0211-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0211 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
J112D3	2/6/06	Soil	C	See note 1
J112D4	2/6/06	Soil	C	See note 1
J112D5	2/6/06	Soil	C	See note 1
J112D6	2/6/06	Soil	C	See note 1
J112D7	2/6/06	Soil	C	See note 1
J112D8	2/6/06	Soil	C	See note 1
J112D9	2/6/06	Soil	C	See note 1
J112F0	2/6/06	Soil	C	See note 1
J112F1	2/6/06	Soil	C	See note 1
J112F2	2/6/06	Soil	C	See note 1
J112F3	2/6/06	Soil	C	See note 1
J112F4	2/6/06	Soil	C	See note 1

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

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

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. 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 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 arsenic result in samples J112D4, J112D6, J112D8, J112D9, J112F3 and J112F4 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the cadmium result in samples J112D3, J112D6 and J112F4 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the sodium result in sample J112F4 was qualified as an estimate and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J112F4) was submitted for analysis. Aluminum, boron, barium, beryllium, calcium, cadmium, copper, iron, manganese, magnesium, nickel, lead, silicon, vanadium and zinc 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 an LCS recovery outside QC limits (67.8%), all silicon results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (59.9%), all antimony 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.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J112D3/J112F3) 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 silver results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0211 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 arsenic result in samples J112D4, J112D6, J112D8, J112D9, J112F3 and J112F4 were qualified as estimates and flagged "UJ".

- Due to method blank contamination, the cadmium result in samples J112D3, J112D6 and J112F4 were qualified as estimates and flagged "UJ".

- Due to method blank contamination, the sodium result in sample J112F4 was qualified as an estimate and flagged "UJ".

- Due to an LCS recovery outside QC limits (67.8%), all silicon results were qualified as estimates and flagged "J".

- Due to a matrix spike recovery outside QC limits (59.9%), all antimony 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.

All silver results 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 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: K0211	REVIEWER: TLI	Project: 100-F-31	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Arsenic	UJ	J112D4, J112D6, J112D8, J112D9, J112F3, J112F4	Blank contamination
Cadmium	UJ	J112D3, J112D6, J112F4	Blank contamination
Sodium	UJ	J112F4	Blank contamination
Antimony	J	All	MS recovery
Silicon	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

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0211																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.42	U	0.42	U	0.44	U	0.41	U	0.42	U	0.41	U	0.41	U	0.41	U	0.42	U
Aluminum		5240		4570		4880		3680		5390		3400		3380		4490		4740	
Arsenic	10	3.0		2.1	UJ	2.4		1.8	UJ	3.5		1.5	UJ	1.8	UJ	2.4		4.8	
Boron		4.0		2.9		3.9		0.79	U	1.8		0.80	U	0.80		2.4		2.0	
Barium	2	80.8		45.1		96.3		27.8		93.7		28.8		33.7		64.6		61.3	
Beryllium		0.19		0.14		0.18		0.09		0.15		0.1		0.09		0.14		0.15	
Calcium		4400		5230		4830		6270		3930		5190		5500		4320		4290	
Cadmium	0.2	0.36	UJ	0.60		0.65		0.33	UJ	0.86		0.46		0.51		0.60		0.68	
Cobalt		4.8		4.5		4.8		3.5		4.5		3.1		3.2		4.4		4.6	
Chromium	1	8.4		9.3		8.3		8.2		10.7		6.9		6.9		8.3		8.5	
Copper		13.2		13.0		14.0		11.6		16.5		11.4		10.6		13.2		12.2	
Iron		15700		13600		16700		11600		15100		9460		9440		14600		13100	
Mercury	0.2	0.02	U	0.02	U	0.01	U	0.02	U	1.2		0.01	U	0.01	U	0.15		0.02	U
Potassium		978		690		1060		590		816		502		539		790		874	
Magnesium		3510		3610		3290		3280		3510		2960		2940		3430		3420	
Manganese		230		221		281		178		212		171		167		204		216	
Molybdenum		0.39	U	0.39	U	0.41	U	0.38	U	0.39	U	0.39	U	0.38	U	0.38	U	0.39	U
Sodium		147		108		307		94.7		122		75.7		79.4		109		107	
Nickel		8.8		9.9		8.8		8.7		10.2		8.0		7.9		9.3		10.3	
Lead	5	7.2		4.5		12.9		2.0		10.6		1.4		2.4		5.6		5.4	
Antimony		0.40	UJ	0.40	UJ	0.49	UJ	0.39	UJ	0.40	UJ	0.40	UJ	0.39	UJ	0.39	UJ	0.40	UJ
Selenium	1	0.36	U	0.36	U	0.38	U	0.35	U	0.36	U	0.36	U	0.35	U	0.35	U	0.36	U
Silicon		643	J	546	J	593	J	518	J	549	J	388	J	508	J	647	J	707	J
Vanadium		37.5		34.9		33.7		29.0		33.7		22.4		22.1		33.2		31.6	
Zinc	1	48.7		35.4		51.7		25.9		66.2		23.0		23.5		32.9		32.4	

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.

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0211																		
Sample Number		J112F2		J112F3		J112F4													
Remarks				Duplicate		E. Blank													
Sample Date		2/6/06		2/6/06		2/6/06													
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.42	U	0.42	U	0.13	U												
Aluminum		5950		4190		59.4													
Arsenic	10	6.2		2.0	UJ	0.76	UJ												
Boron		2.4		2.5		0.53													
Barium	2	76.6		71.9		2.1													
Beryllium		0.20		0.12		0.11													
Calcium		4140		3750		27.2													
Cadmium	0.2	0.62		0.70		0.07	UJ												
Cobalt		4.8		4.2		0.11	U												
Chromium	1	10.4		7.1		0.15	U												
Copper		13.8		12.2		0.25													
Iron		16100		12100		577													
Mercury	0.2	0.02		0.02	U	0.01	U												
Potassium		978		822		51.4	U												
Magnesium		3750		2970		9.8													
Manganese		226		197		8.1													
Molybdenum		0.39	U	0.39	U	0.12	U												
Sodium		131		123		11.0	UJ												
Nickel		11.1		8.9		0.13													
Lead	5	11.2		5.9		0.37													
Antimony		0.40	UJ	0.40	UJ	0.38	UJ												
Selenium	1	0.36	U	0.36	U	0.34	U												
Silicon		661	J	517	J	49.5	J												
Vanadium		35.1		31.1		0.24													
Zinc	1	36.1		42.9		2.0													

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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 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J112D3	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	5240	MG/KG	3.1	1.0
		Arsenic, Total	3.0	MG/KG	0.34	1.0
		Boron, Total	4.0	MG/KG	0.82	3.0
		Barium, Total	80.8	MG/KG	0.06	3.0
		Beryllium, Total	0.19	MG/KG	0.02	1.0
		Calcium, Total	4400	MG/KG	3.6	3.0
		Cadmium, Total	0.36 UJ	MG/KG	0.21	3.0
		Cobalt, Total	4.8	MG/KG	0.36	3.0
		Chromium, Total	8.4	MG/KG	0.49	3.0
		Copper, Total	13.2	MG/KG	0.36	3.0
		Iron, Total	15700	MG/KG	9.7	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	978	MG/KG	54.5	1.0
		Magnesium, Total	3510	MG/KG	4.1	3.0
		Manganese, Total	230	MG/KG	0.54	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	147	MG/KG	2.9	1.0
		Nickel, Total	8.8	MG/KG	0.39	3.0
		Lead, Total	7.2	MG/KG	0.94	3.0
		Antimony, Total	0.40 uJ	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	643 J	MG/KG	2.5	3.0
		Vanadium, Total	37.5	MG/KG	0.27	3.0
		Zinc, Total	48.7	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

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LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J112D4	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	4570	MG/KG	3.1	1.0
		Arsenic, Total	2.1 UJ	MG/KG	0.34	1.0
		Boron, Total	2.9	MG/KG	0.81	3.0
		Barium, Total	45.1	MG/KG	0.06	3.0
		Beryllium, Total	0.14	MG/KG	0.02	1.0
		Calcium, Total	5230	MG/KG	3.6	3.0
		Cadmium, Total	0.60	MG/KG	0.21	3.0
		Cobalt, Total	4.5	MG/KG	0.36	3.0
		Chromium, Total	9.3	MG/KG	0.48	3.0
		Copper, Total	13.0	MG/KG	0.36	3.0
		Iron, Total	13600	MG/KG	9.7	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	690	MG/KG	54.1	1.0
		Magnesium, Total	3610	MG/KG	4.1	3.0
		Manganese, Total	221	MG/KG	0.53	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	108	MG/KG	2.8	1.0
		Nickel, Total	9.9	MG/KG	0.39	3.0
		Lead, Total	4.5	MG/KG	0.93	3.0
		Antimony, Total	0.40 uJ	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	546 J	MG/KG	2.5	3.0
		Vanadium, Total	34.9	MG/KG	0.27	3.0
		Zinc, Total	35.4	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J112D5	Silver, Total	0.44 u	MG/KG	0.44	3.0
		Aluminum, Total	4880	MG/KG	3.2	1.0
		Arsenic, Total	2.4	MG/KG	0.36	1.0
		Boron, Total	3.9	MG/KG	0.85	3.0
		Barium, Total	96.3	MG/KG	0.06	3.0
		Beryllium, Total	0.18	MG/KG	0.02	1.0
		Calcium, Total	4830	MG/KG	3.7	3.0
		Cadmium, Total	0.65	MG/KG	0.22	3.0
		Cobalt, Total	4.8	MG/KG	0.38	3.0
		Chromium, Total	8.3	MG/KG	0.50	3.0
		Copper, Total	14.0	MG/KG	0.38	3.0
		Iron, Total	16700	MG/KG	10.1	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1060	MG/KG	56.6	1.0
		Magnesium, Total	3290	MG/KG	4.2	3.0
		Manganese, Total	281	MG/KG	0.56	1.0
		Molybdenum, Total	0.41 u	MG/KG	0.41	3.0
		Sodium, Total	307	MG/KG	3.0	1.0
		Nickel, Total	8.8	MG/KG	0.41	3.0
		Lead, Total	12.9	MG/KG	0.98	3.0
		Antimony, Total	0.49 J	MG/KG	0.42	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
		Silicon, Total	593 J	MG/KG	2.6	3.0
		Vanadium, Total	33.7	MG/KG	0.28	3.0
		Zinc, Total	51.7	MG/KG	0.16	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211

LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J112D6	Silver, Total	0.41 u	MG/KG	0.41	3.0
		Aluminum, Total	3680	MG/KG	3.0	1.0
		Arsenic, Total	1.8 UJ	MG/KG	0.33	1.0
		Boron, Total	0.79 u	MG/KG	0.79	3.0
		Barium, Total	27.8	MG/KG	0.06	3.0
		Beryllium, Total	0.09	MG/KG	0.02	1.0
		Calcium, Total	6270	MG/KG	3.5	3.0
		Cadmium, Total	0.33 UJ	MG/KG	0.20	3.0
		Cobalt, Total	3.5	MG/KG	0.35	3.0
		Chromium, Total	8.2	MG/KG	0.47	3.0
		Copper, Total	11.6	MG/KG	0.36	3.0
		Iron, Total	11600	MG/KG	9.4	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	590	MG/KG	52.5	1.0
		Magnesium, Total	3280	MG/KG	3.9	3.0
		Manganese, Total	178	MG/KG	0.52	1.0
		Molybdenum, Total	0.38 u	MG/KG	0.38	3.0
		Sodium, Total	94.7	MG/KG	2.7	1.0
		Nickel, Total	8.7	MG/KG	0.38	3.0
		Lead, Total	2.0	MG/KG	0.90	3.0
		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	518 J	MG/KG	2.4	3.0
		Vanadium, Total	29.0	MG/KG	0.26	3.0
		Zinc, Total	25.9	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J112D7	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	5390	MG/KG	3.0	1.0
		Arsenic, Total	3.5	MG/KG	0.34	1.0
		Boron, Total	1.8	MG/KG	0.81	3.0
		Barium, Total	93.7	MG/KG	0.06	3.0
		Beryllium, Total	0.15	MG/KG	0.02	1.0
		Calcium, Total	3930	MG/KG	3.6	3.0
		Cadmium, Total	0.86	MG/KG	0.21	3.0
		Cobalt, Total	4.5	MG/KG	0.36	3.0
		Chromium, Total	10.7	MG/KG	0.48	3.0
		Copper, Total	16.5	MG/KG	0.36	3.0
		Iron, Total	15100	MG/KG	9.6	3.0
		Mercury, Total	1.2	MG/KG	0.05	3.0
		Potassium, Total	816	MG/KG	53.9	1.0
		Magnesium, Total	3510	MG/KG	4.0	3.0
		Manganese, Total	212	MG/KG	0.53	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	122	MG/KG	2.8	1.0
		Nickel, Total	10.2	MG/KG	0.39	3.0
		Lead, Total	10.6	MG/KG	0.93	3.0
		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	549 J	MG/KG	2.5	3.0
		Vanadium, Total	33.7	MG/KG	0.27	3.0
		Zinc, Total	66.2	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J112D8	Silver, Total	0.41 u	MG/KG	0.41	3.0
		Aluminum, Total	3400	MG/KG	3.0	1.0
		Arsenic, Total	1.5 UJ	MG/KG	0.34	1.0
		Boron, Total	0.80 u	MG/KG	0.80	3.0
		Barium, Total	28.8	MG/KG	0.06	3.0
		Beryllium, Total	0.1	MG/KG	0.02	1.0
		Calcium, Total	5190	MG/KG	3.5	3.0
		Cadmium, Total	0.46	MG/KG	0.21	3.0
		Cobalt, Total	3.1	MG/KG	0.36	3.0
		Chromium, Total	6.9	MG/KG	0.47	3.0
		Copper, Total	11.4	MG/KG	0.36	3.0
		Iron, Total	9460	MG/KG	9.5	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	502	MG/KG	53.3	1.0
		Magnesium, Total	2960	MG/KG	4.0	3.0
		Manganese, Total	171	MG/KG	0.52	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	75.7	MG/KG	2.8	1.0
		Nickel, Total	8.0	MG/KG	0.39	3.0
		Lead, Total	1.4	MG/KG	0.92	3.0
		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	388 J	MG/KG	2.4	3.0
		Vanadium, Total	22.4	MG/KG	0.27	3.0
		Zinc, Total	23.0	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-007	J112D9	Silver, Total	0.41 u	MG/KG	0.41	3.0
		Aluminum, Total	3380	MG/KG	3.0	1.0
		Arsenic, Total	1.8 UJ	MG/KG	0.33	1.0
		Boron, Total	0.80	MG/KG	0.79	3.0
		Barium, Total	33.7	MG/KG	0.06	3.0
		Beryllium, Total	0.09	MG/KG	0.02	1.0
		Calcium, Total	5500	MG/KG	3.5	3.0
		Cadmium, Total	0.51	MG/KG	0.20	3.0
		Cobalt, Total	3.2	MG/KG	0.35	3.0
		Chromium, Total	6.9	MG/KG	0.47	3.0
		Copper, Total	10.6	MG/KG	0.35	3.0
		Iron, Total	9440	MG/KG	9.4	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	539	MG/KG	52.6	1.0
		Magnesium, Total	2940	MG/KG	3.9	3.0
		Manganese, Total	167	MG/KG	0.52	1.0
		Molybdenum, Total	0.38 u	MG/KG	0.38	3.0
		Sodium, Total	79.4	MG/KG	2.7	1.0
		Nickel, Total	7.9	MG/KG	0.38	3.0
		Lead, Total	2.4	MG/KG	0.91	3.0
		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	508 J	MG/KG	2.4	3.0
		Vanadium, Total	22.1	MG/KG	0.26	3.0
		Zinc, Total	23.5	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	J112F0	Silver, Total	0.41 u	MG/KG	0.41	3.0
		Aluminum, Total	4490	MG/KG	3.0	1.0
		Arsenic, Total	2.4	MG/KG	0.33	1.0
		Boron, Total	2.4	MG/KG	0.79	3.0
		Barium, Total	64.6	MG/KG	0.06	3.0
		Beryllium, Total	0.14	MG/KG	0.02	1.0
		Calcium, Total	4320	MG/KG	3.5	3.0
		Cadmium, Total	0.60	MG/KG	0.20	3.0
		Cobalt, Total	4.4	MG/KG	0.35	3.0
		Chromium, Total	8.3	MG/KG	0.47	3.0
		Copper, Total	13.2	MG/KG	0.35	3.0
		Iron, Total	14600	MG/KG	9.4	3.0
		Mercury, Total	0.15	MG/KG	0.02	1.0
		Potassium, Total	790	MG/KG	52.5	1.0
		Magnesium, Total	3430	MG/KG	3.9	3.0
		Manganese, Total	204	MG/KG	0.52	1.0
		Molybdenum, Total	0.38 u	MG/KG	0.38	3.0
		Sodium, Total	109	MG/KG	2.7	1.0
		Nickel, Total	9.3	MG/KG	0.38	3.0
		Lead, Total	5.6	MG/KG	0.90	3.0
		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	647 J	MG/KG	2.4	3.0
		Vanadium, Total	33.2	MG/KG	0.26	3.0
		Zinc, Total	32.9	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J112F1	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	4740	MG/KG	3.0	1.0
		Arsenic, Total	4.8	MG/KG	0.34	1.0
		Boron, Total	2.0	MG/KG	0.81	3.0
		Barium, Total	61.3	MG/KG	0.06	3.0
		Beryllium, Total	0.15	MG/KG	0.02	1.0
		Calcium, Total	4290	MG/KG	3.6	3.0
		Cadmium, Total	0.68	MG/KG	0.21	3.0
		Cobalt, Total	4.6	MG/KG	0.36	3.0
		Chromium, Total	8.5	MG/KG	0.48	3.0
		Copper, Total	12.2	MG/KG	0.36	3.0
		Iron, Total	13100	MG/KG	9.6	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	874	MG/KG	54.0	1.0
		Magnesium, Total	3420	MG/KG	4.0	3.0
		Manganese, Total	216	MG/KG	0.53	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	107	MG/KG	2.8	1.0
		Nickel, Total	10.3	MG/KG	0.39	3.0
		Lead, Total	5.4	MG/KG	0.93	3.0
		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	707 J	MG/KG	2.5	3.0
		Vanadium, Total	31.6	MG/KG	0.27	3.0
		Zinc, Total	32.4	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	J112F2	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	5950	MG/KG	3.1	1.0
		Arsenic, Total	6.2	MG/KG	0.34	1.0
		Boron, Total	2.4	MG/KG	0.81	3.0
		Barium, Total	76.6	MG/KG	0.06	3.0
		Beryllium, Total	0.20	MG/KG	0.02	1.0
		Calcium, Total	4140	MG/KG	3.6	3.0
		Cadmium, Total	0.62	MG/KG	0.21	3.0
		Cobalt, Total	4.8	MG/KG	0.36	3.0
		Chromium, Total	10.4	MG/KG	0.48	3.0
		Copper, Total	13.8	MG/KG	0.36	3.0
		Iron, Total	16100	MG/KG	9.7	3.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Potassium, Total	978	MG/KG	54.2	1.0
		Magnesium, Total	3750	MG/KG	4.1	3.0
		Manganese, Total	226	MG/KG	0.53	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	131	MG/KG	2.8	1.0
		Nickel, Total	11.1	MG/KG	0.39	3.0
		Lead, Total	11.2	MG/KG	0.93	3.0
		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	661 J	MG/KG	2.5	3.0
		Vanadium, Total	35.1	MG/KG	0.27	3.0
		Zinc, Total	36.1	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J112F3	Silver, Total	0.42 u	MG/KG	0.42	3.0
		Aluminum, Total	4190	MG/KG	3.1	1.0
		Arsenic, Total	2.0 UJ	MG/KG	0.34	1.0
		Boron, Total	2.5	MG/KG	0.81	3.0
		Barium, Total	71.9	MG/KG	0.06	3.0
		Beryllium, Total	0.12	MG/KG	0.02	1.0
		Calcium, Total	3750	MG/KG	3.6	3.0
		Cadmium, Total	0.70	MG/KG	0.21	3.0
		Cobalt, Total	4.2	MG/KG	0.36	3.0
		Chromium, Total	7.1	MG/KG	0.48	3.0
		Copper, Total	12.2	MG/KG	0.36	3.0
		Iron, Total	12100	MG/KG	9.7	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	822	MG/KG	54.3	1.0
		Magnesium, Total	2970	MG/KG	4.1	3.0
		Manganese, Total	197	MG/KG	0.53	1.0
		Molybdenum, Total	0.39 u	MG/KG	0.39	3.0
		Sodium, Total	123	MG/KG	2.8	1.0
		Nickel, Total	8.9	MG/KG	0.39	3.0
		Lead, Total	5.9	MG/KG	0.94	3.0
		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	517 J	MG/KG	2.5	3.0
		Vanadium, Total	31.1	MG/KG	0.27	3.0
		Zinc, Total	42.9	MG/KG	0.15	3.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211

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

LVL LOT #: 0602L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-012	J112P4	Silver, Total	0.13 u	MG/KG	0.13	1.0
		Aluminum, Total	59.4	MG/KG	2.9	1.0
		Arsenic, Total	0.76 UJ	MG/KG	0.32	1.0
		Boron, Total	0.53	MG/KG	0.26	1.0
		Barium, Total	2.1	MG/KG	0.02	1.0
		Beryllium, Total	0.11	MG/KG	0.02	1.0
		Calcium, Total	27.2	MG/KG	1.1	1.0
		Cadmium, Total	0.07 UJ	MG/KG	0.07	1.0
		Cobalt, Total	0.11 u	MG/KG	0.11	1.0
		Chromium, Total	0.15 u	MG/KG	0.15	1.0
		Copper, Total	0.25	MG/KG	0.11	1.0
		Iron, Total	577	MG/KG	3.1	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	51.4 u	MG/KG	51.4	1.0
		Magnesium, Total	9.8	MG/KG	1.3	1.0
		Manganese, Total	8.1	MG/KG	0.50	1.0
		Molybdenum, Total	0.12 u	MG/KG	0.12	1.0
		Sodium, Total	11.0 UJ	MG/KG	2.7	1.0
		Nickel, Total	0.13	MG/KG	0.12	1.0
		Lead, Total	0.37	MG/KG	0.30	1.0
		Antimony, Total	0.38 u J	MG/KG	0.38	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
		Silicon, Total	49.5 J	MG/KG	0.78	1.0
		Vanadium, Total	0.24	MG/KG	0.09	1.0
		Zinc, Total	2.0	MG/KG	0.05	1.0

4/1/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0602L224
SDG/SAF#: K0211/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 02-08-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 12 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. In the initial ICP data file (TA0214B), the CCV following the last of these samples was out of control for multiple analytes. Only Arsenic, Selenium, and Antimony were reported from this file. All samples were rerun for the remaining analytes in file TA0217C, with 3-fold dilutions on all samples except for sample J112F4, due to sample matrix. All samples were reported, without dilution, from a different instrument (file PS0220A) for Aluminum, Beryllium, Potassium, Manganese, and Sodium, due to high concentrations and sample matrix. Sample J112D7 was rerun with a 3-fold dilution for Mercury due to high concentration.

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) with the exception of the CCV noted in #2 above.

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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 Selenium (78.5%) and Silicon (67.8%). Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased slightly 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 38 pages.

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

10. The matrix spike (MS) recoveries for 4 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
J112D3	Aluminum	63,000	95.6
	Iron	63,000	122.5
	Manganese	3,000	79.4
	Antimony	100	93.1

12. The duplicate analysis for 1 analyte was 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

2/24/06
Date

jjw/m02-224

LVLI
LIONVILLE LABORATORY INC.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 2 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Day		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation		SAF No.: RC-032
Air Quality:			
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060282		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No. / Matrix * / Sample Date / Sample Time											
J112D8 / SOIL / 2-6-06 / 0900	X	X	X	X							
J112D9 / SOIL / 2-6-06 / 0910	X	X	X	X							
J112F0 / SOIL / 2-6-06 / 0920	X	X	X	X							
J112F1 / SOIL / 2-6-06 / 0930	X	X	X	X							
J112F2 / SOIL / 2-6-06 / 0940	X	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	MLK mstankovich	2/6/06 1430	3728/2C	2/6/06 1430
Relinquished By/Removed From	3728/2C	2-7-06 1000	RZ Stiffler RJ Stiffler	2-7-06 1000
Relinquished By/Removed From	RZ Stiffler RJ Stiffler	2-7-06 1500	Fed Ex	
Relinquished By/Removed From	Fed Ex	2-8-06 1000	Nieuwendy	2-8-06 1000
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/7/06

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)

000029

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 3 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman — Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 8C — Data Turnaround: 15 day
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	Air Quality:
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174 — COA: R10F312000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No. / Matrix * / Sample Date / Sample Time											
J112F3 / SOIL / 2-6-06 / 0810	X	X	X	X							
J112F4 / SOIL / 2-6-06 / 0800	X			X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: M2L m Stankovich	1430 2/6/06	Received By/Stored In: 3728/2C	2/6/06 1430
Relinquished By/Removed From: 3728/2C	2-7-06 1000	Received By/Stored In: R2 Stiffler R.J. Stiffler	1000 2-7-06
Relinquished By/Removed From: R2 Stiffler R.J. Stiffler	1500 2-7-06	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	2-8-06 1000	Received By/Stored In: V. Hernandez	2-8-06 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 2C on 2/7/06

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

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

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

000030

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-31			DATA PACKAGE: K0211		
VALIDATOR: TLI		LAB: LLI		DATE: 4/1/06	
			SDG: K0211		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J112D3	J112D4	J112D5	J112D6	J112D7	J112D8
J112D9	J112F0	J112F1	J112F2	J112F3	J112F4

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No ~~N/A~~
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: arsenic - D4, D6, D8, D9, F3, F4 - UJ
cadmium - D3, D6, F4 - UJ
sodium - F4 - UJ
FB - all except silver, cobalt, chromium, Hg, potassium, moly, Antimony + selenium

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: Antimony 59.9% - J all MS
Silicon 67.8% - J all

no pts

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: _____

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: Silver - all over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0092-MB1	Silver, Total	0.14	u	MG/KG	0.14	1.0
		Aluminum, Total	3.0	u	MG/KG	3.0	1.0
		Arsenic, Total	0.45		MG/KG	0.34	1.0
		Boron, Total	0.27	u	MG/KG	0.27	1.0
		Barium, Total	0.02	u	MG/KG	0.02	1.0
		Beryllium, Total	0.02	u	MG/KG	0.02	1.0
		Calcium, Total	1.2	u	MG/KG	1.2	1.0
		Cadmium, Total	0.09		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	54.0	u	MG/KG	54.0	1.0
		Magnesium, Total	1.4	u	MG/KG	1.4	1.0
		Manganese, Total	0.53	u	MG/KG	0.53	1.0
		Molybdenum, Total	0.19		MG/KG	0.13	1.0
		Sodium, Total	3.2		MG/KG	2.8	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	0.05	u	MG/KG	0.05	1.0
BLANK1	06C0024-MB1	Mercury, Total	0.02	u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J112D3	Silver, Total	4.5	0.42u	5.1	88.2	3.0
		Aluminum, Total	5240	5240	202	4.0*	1.0
		Arsenic, Total	182	3.0	202	88.7	1.0
		Boron, Total	95.6	4.0	101	90.6	3.0
		Barium, Total	267	80.8	202	92.2	3.0
		Beryllium, Total	4.8	0.19	5.1	90.5	1.0
		Calcium, Total	6960	4400	2530	101.2	3.0
		Cadmium, Total	5.6	0.36	5.1	102.7	3.0
		Cobalt, Total	52.6	4.8	50.6	94.5	3.0
		Chromium, Total	27.2	8.4	20.2	93.1	3.0
		Copper, Total	37.7	13.2	25.3	96.8	3.0
		Iron, Total	15200	15700	101	-480. *	3.0
		Mercury, Total	0.17	0.02u	0.15	111.8	1.0
		Potassium, Total	3200	978	2530	88.0	1.0
		Magnesium, Total	5700	3510	2530	86.6	3.0
		Manganese, Total	255	230	50.6	49.4*	1.0
		Molybdenum, Total	95.6	0.39u	101	94.6	3.0
		Sodium, Total	2530	147	2530	94.1	1.0
		Nickel, Total	56.8	8.8	50.6	94.9	3.0
		Lead, Total	56.1	7.2	50.6	96.6	3.0
		Antimony, Total	30.3	0.40u	50.6	59.9	1.0
		Selenium, Total	161	0.36u	202	79.6	1.0
		Silicon, Total	736	643	101	91.8*	3.0
		Vanadium, Total	83.7	37.5	50.6	91.3	3.0
		Zinc, Total	98.8	48.7	50.6	99.0	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J112D3	Silver, Total	0.42u	0.43u	NC	3.0
		Aluminum, Total	5240	4570	13.5	1.0
		Arsenic, Total	3.0	2.7	10.5	1.0
		Boron, Total	4.0	4.2	4.9	3.0
		Barium, Total	80.8	74.8	7.7	3.0
		Beryllium, Total	0.19	0.16	17.4	1.0
		Calcium, Total	4400	3990	9.9	3.0
		Cadmium, Total	0.36	0.48	28.3	3.0
		Cobalt, Total	4.8	4.3	11.0	3.0
		Chromium, Total	8.4	7.2	15.4	3.0
		Copper, Total	13.2	12.4	6.2	3.0
		Iron, Total	15700	13300	16.9	3.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Potassium, Total	978	894	8.9	1.0
		Magnesium, Total	3510	3140	11.1	3.0
		Manganese, Total	230	209	9.5	1.0
		Molybdenum, Total	0.39u	0.40u	NC	3.0
		Sodium, Total	147	143	2.9	1.0
		Nickel, Total	8.8	8.6	2.3	3.0
		Lead, Total	7.2	6.7	7.2	3.0
		Antimony, Total	0.40u	0.41u	NC	1.0
		Selenium, Total	0.36u	0.37u	NC	1.0
		Silicon, Total	643	568	12.3	3.0
		Vanadium, Total	37.5	32.4	14.6	3.0
		Zinc, Total	48.7	44.8	8.3	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/23/06

CLIENT: TNUHANFORD RC-032 K0211 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	06L0092-LC1	Silver, LCS	47.1	50.0	MG/KG	94.2
		Aluminum, LCS	441	500	MG/KG	88.3
		Arsenic, LCS	880	1000	MG/KG	88.0
		Boron, LCS	446	500	MG/KG	89.2
		Barium, LCS	482	500	MG/KG	96.4
		Beryllium, LCS	22.8	25.0	MG/KG	91.2
		Calcium, LCS	2320	2500	MG/KG	93.0
		Cadmium, LCS	23.6	25.0	MG/KG	94.4
		Cobalt, LCS	240	250	MG/KG	96.2
		Chromium, LCS	49.6	50.0	MG/KG	99.2
		Copper, LCS	121	125	MG/KG	96.8
		Iron, LCS	490	500	MG/KG	97.9
		Potassium, LCS	2210	2500	MG/KG	88.6
		Magnesium, LCS	2280	2500	MG/KG	91.3
		Manganese, LCS	65.7	75.0	MG/KG	87.6
		Molybdenum, LCS	496	500	MG/KG	99.3
		Sodium, LCS	2210	2500	MG/KG	88.3
		Nickel, LCS	188	200	MG/KG	94.0
		Lead, LCS	228	250	MG/KG	91.2
		Antimony, LCS	278	300	MG/KG	92.8
		Selenium, LCS	785	1000	MG/KG	78.5
		Silicon, LCS	339	500	MG/KG	67.8
		Vanadium, LCS	248	250	MG/KG	99.1
		Zinc, LCS	91.2	100	MG/KG	91.2
LCS1	06C0024-LC1	Mercury, LCS	7.0	6.2	MG/KG	112.7

Date: 4 April 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Sites 100-F-31
Subject: PCB - Data Package No. K0211-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0211 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	Matrix	Validation	Date
J112D3	2/6/06	Soil	C	See note 1
J112D4	2/6/06	Soil	C	See note 1
J112D5	2/6/06	Soil	C	See note 1
J112D6	2/6/06	Soil	C	See note 1
J112D7	2/6/06	Soil	C	See note 1
J112D8	2/6/06	Soil	C	See note 1
J112D9	2/6/06	Soil	C	See note 1
J112F0	2/6/06	Soil	C	See note 1
J112F1	2/6/06	Soil	C	See note 1
J112F2	2/6/06	Soil	C	See note 1
J112F3	2/6/06	Soil	C	See note 1

1 – PCBs by 8082

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

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil

samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

All holding times were acceptable.

- **Method Blank**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

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

Due to a matrix spike recovery above QC limits (142%), all detected PCB results (except aroclor 1016) 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.

Due to the surrogate being diluted out, all PCB results in sample J112F2 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J112D3/J112F3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All undetected PCB results in sample J112F2 exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data Package No. K0211 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 a matrix spike recovery above QC limits (142%), all detected PCB results (except aroclor 1016) were qualified as estimates and flagged "J".

- Due to the surrogate being diluted out, all PCB results in sample J112F2 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 the procedures herein are as follows:

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: K0211	REVIEWER: TH	Project: 100-F-31	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All (except aroclor-1016)	J	All	MS recovery
All	J	J112F2	Surrogate diluted out

* - 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

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0211																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Extraction Date		2/13/06		2/13/06		2/13/06		2/13/06		2/13/06		2/13/06		2/13/06		2/13/06		2/13/06	
Analysis Date		2/20/06		2/20/06		2/20/06		2/20/06		2/21/06		2/21/06		2/21/06		2/21/06		2/21/06	
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1221	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1232	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1242	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1248	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Aroclor-1254	100	14	U	14	U	15	U	14	U	71	J	14	U	14	U	31	J	20	J
Aroclor-1260	100	14	U	14	U	15	U	14	U	14	U	14	U	14	U	14	U	14	U
Sample Number		J112F2		J112F3															
Remarks				Duplicate															
Sample Date		2/6/06		2/6/06															
Extraction Date		2/13/06		2/13/06															
Analysis Date		2/20/06		2/20/06															
PCB	RQL	Result	Q	Result	Q														
Aroclor-1016	100	700	UJ	14	U														
Aroclor-1221	100	700	UJ	14	U														
Aroclor-1232	100	700	UJ	14	U														
Aroclor-1242	100	700	UJ	14	U														
Aroclor-1248	100	7300	J	14	U														
Aroclor-1254	100	700	UJ	14	U														
Aroclor-1260	100	700	UJ	14	U														

000010

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.

PCBs by GC

Report Date: 02/26/06 16:11

RFW Batch Number: 0602L224 Client: TNUHANFORD RC-032 K0211 Work Order: 11343606001 Page: 1

	Cust ID:	J112D3	J112D4	J112D5	J112D6	J112D7	J112D8
Sample Information	RFW#:	001	002	003	004	005	006
	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		86 %	85 %	72 %	87 %	95 %	101 %
Decachlorobiphenyl		91 %	89 %	88 %	92 %	92 %	102 %
Aroclor-1016		14 U	14 U	15 U	14 U	14 U	14 U
Aroclor-1221		14 U	14 U	15 U	14 U	14 U	14 U
Aroclor-1232		14 U	14 U	15 U	14 U	14 U	14 U
Aroclor-1242		14 U	14 U	15 U	14 U	14 U	14 U
Aroclor-1248		14 U	14 U	15 U	14 U	14 U	14 U
Aroclor-1254		14 U	14 U	15 U	14 U	71 J	14 U
Aroclor-1260		14 U	14 U	15 U	14 U	14 U	14 U

	Cust ID:	J112D9	J112F0	J112F1	J112F1	J112F1	J112F2
Sample Information	RFW#:	007	008	009	009 MS	009 MSD	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	50.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		94 %	103 %	89 %	104 %	92 %	D %
Decachlorobiphenyl		98 %	104 %	94 %	107 %	97 %	D %
Aroclor-1016		14 U	14 U	14 U	129 %	117 %	700 U J
Aroclor-1221		14 U	14 U	14 U	14 U	14 U	700 U
Aroclor-1232		14 U	14 U	14 U	14 U	14 U	700 U
Aroclor-1242		14 U	14 U	14 U	14 U	14 U	700 U
Aroclor-1248		14 U	14 U	14 U	14 U	14 U	7300
Aroclor-1254		14 U	31 J	20 J	I	I	700 U
Aroclor-1260		14 U	14 U	14 U	142 * %	131 %	700 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

2/27/6 3/1/06

000000004

000011

PCBs by GC

Report Date: 02/26/06 16:11

RFW Batch Number: 0602L224 Client: TNUHANFORD RC-032 K0211 Work Order: 11343606001 Page: 2

	Cust ID:	J112F3	PBLKBP	PBLKBP BS
Sample Information	RFW#:	011	06LE0112-MB1	06LE0112-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG

Surrogate:	Tetrachloro-m-xylene	85	%	87	%	104	%
	Decachlorobiphenyl	92	%	87	%	107	%

Aroclor-1016	14	U	13	U	116	%	
Aroclor-1221	14	U	13	U	13	U	
Aroclor-1232	14	U	13	U	13	U	
Aroclor-1242	14	U	13	U	13	U	
Aroclor-1248	14	U	13	U	13	U	
Aroclor-1254	14	U	13	U	13	U	
Aroclor-1260	14	U	13	U	118	%	

000012

4/1/06

2/27/6

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0602L224
SDG/SAF # K0211/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 02-08-2006

PCB

Eleven (11) soil samples were collected on 02-06-2006.

The samples and their associated QC samples were extracted on 02-13-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 02-20,21,22-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. One (1) of four (4) matrix spike recoveries was outside acceptance criteria due to the presence of interfering target compound Aroclor-1254 in the sample.
8. The sample J112F2 required a 50-fold dilution due to high concentration of target analytes. The reporting limits were adjusted to reflect the necessary dilution.
9. The initial calibrations associated with this data set were within acceptance criteria.
10. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
11. Patterns for Aroclors-1248 and 1254 were identified in the samples. The reported Aroclors were chosen based on the best pattern march and fit. Quantitation was performed using congeners common to both Aroclors to give the best overall total PCB concentration.
12. 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.
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

3/1/06
Date

som\r:\group\data\pest\tnu hanford\0602-224.pcbs
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 1 1 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-032-007	Page 1 of 1

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 days	Air Quality:	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions						
Sample No.	Matrix *	Sample Date	Sample Time								
J112D3	SOIL	2-6-06	0810	X	X	X	X				
J112D4	SOIL	2-6-06	0820	X	X	X	X				
J112D5	SOIL	2-6-06	0830	X	X	X	X				
J112D6	SOIL	2-6-06	0840	X	X	X	X				
J112D7	SOIL	2-6-06	0850	X	X	X	X				

000015

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MZK m Stankovich	2/6/06 1430	3728/2C	2/6/06 1430
3728/2C	2-7-06 1000	RZ Steffler R.J. Steffler	2-7-06 1000
RZ Steffler R.J. Steffler	2-7-06 1500	Fed Ex	
Fed Ex	2-8-06 1000	[illegible]	2-8-06 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728
Ref # 2C on 2/7/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
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)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 2 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Price Code 8C	Data Turnaround 15 days		
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation		SAF No. RC-032
Air Quality			
Ice Chest No. AFS-04-001	Field Logbook No. EFL-1174	COA R10F312000	Method of Shipment FedEx
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060282		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
J112D8	SOIL	2-6-06	0900	X	X	X	X				
J112D9	SOIL	2-6-06	0910	X	X	X	X				
J112F0	SOIL	2-6-06	0920	X	X	X	X				
J112F1	SOIL	2-6-06	0930	X	X	X	X				
J112F2	SOIL	2-6-06	0940	X	X	X	X				

000016

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1430	Received By/Stored In	Date/Time
MLK mstankovich	2/6/06	3728/2C	2/6/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 1000
3728/2C	2-7-06 1000	RZ Steffler RZ Steffler	2-7-06
Relinquished By/Removed From	Date/Time 1500	Received By/Stored In	Date/Time
RZ Steffler RZ Steffler	2-7-06	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	2-8-06 1000	V Niccoundy	2-8-06 1000
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) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/7/06

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)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 3 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation		SAF No. RC-032
Ice Chest No. AFS-04-001	Field Logbook No. EFL-1174	COA R10F312000	Method of Shipment FedEx
Shipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. A060282		Bill of Lading/Air Bill No. See OSPC

Price Code 8C

Air Quality

Data Turnaround 15 day

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A.(TCL)	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
J112F3	SOIL	2-6-06	0810	X	X	X	X				
J112F4	SOIL	2-6-06	0800	X			X				

000017

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From M2 M Stankovich	1430 2/6/06	Received By/Stored In 3728/2C	2/6/06 1430
Relinquished By/Removed From 3728/2C	2-7-06 1000	Received By/Stored In RZ Stiffler RZ Stiffler	1000 2-7-06
Relinquished By/Removed From RZ Stiffler RZ Stiffler	1500 2-7-06	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex	2-8-06 1000	Received By/Stored In V Hernandez	2-8-06 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728
Ref # 2C on 2/7/06

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

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-31			DATA PACKAGE: K0211		
VALIDATOR: TLI		LAB: LLI		DATE: 4/1/06	
			SDG: K0211		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J112D3	J112D4	J112D5	J112D6	J112D7	J112D8
J112D9	J112F0	J112F1	J112F2	J112F3	
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: Surr diluted out in F2 - J all
MS- high - J all detect (except 1011)
no PAS

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: all undetect in F2 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: 4 April 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-31
Subject: Radiochemistry - Data Package No. K0211-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0211 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
J112D3	2/6/06	Soil	C	See note 1
J112D4	2/6/06	Soil	C	See note 1
J112D5	2/6/06	Soil	C	See note 1
J112D6	2/6/06	Soil	C	See note 1
J112D7	2/6/06	Soil	C	See note 1
J112D8	2/6/06	Soil	C	See note 1
J112D9	2/6/06	Soil	C	See note 1
J112F0	2/6/06	Soil	C	See note 1
J112F1	2/6/06	Soil	C	See note 1
J112F2	2/6/06	Soil	C	See note 1
J112F3	2/6/06	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. 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.

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.

Due to an RPD outside QC limits (45%), all thorium-232 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J112D3/J112F3) were submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates 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. Fifty-five analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0211 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

Due to an RPD outside QC limits (45%), all thorium-232 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.

Fifty-five 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: K0211	REVIEWER: PLI	Project: 100-F-31	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-232	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																			
Laboratory: EB																			
Case	SDG: K0211																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Potassium-40		9.48		14.0		U	U	15.4		13.7		11.3		11.8		U	U	14.1	
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Radium-226		U	U	0.354		U	U	0.635		0.548		U	U	U	U	U	U	0.546	
Radium-228		U	U	U	U	U	U	0.769		U	U	U	U	U	U	U	U	U	U
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		U	U	0.521		0.526		0.507		0.597		0.548		0.565		U	U	0.687	
Thorium-232		U	UJ	U	UJ	U	UJ	0.769	J	U	UJ	U	UJ	U	UJ	U	UJ	U	UJ
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Silver-108m		U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

Sample Number		J112F2		J112F3	
Remarks				Duplicate	
Sample Date		2/6/06		2/6/06	
Radiochemistry	RQL	Result	Q	Result	Q
Potassium-40		13.6		9.53	
Cobalt 60	0.05	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*
Radium-226		0.714		U	U
Radium-228		0.707		U	U
Europium 152	0.1	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*
Thorium-228		0.677		0.683	
Thorium-232		0.707	J	U	UJ
Uranium-235(gea)		U	U	U	U
Uranium-238(gea)		U	U	U	U
Americium-241(gea)		U	U	U	U
Silver-108m		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 K0211

7726-001 J112D3

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-01	Client sample id	J112D3		
Dept sample id	7726-001	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:10	608.5 g	
% solids	94.9	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	9.48	2.0	1.6			GAM
Cobalt 60	10198-40-0	U		0.18	0.050	U	GAM
Cesium 137	10045-97-3	U		0.17	0.10	U	GAM
Radium 226	13982-63-3	U		0.34	0.10	U	GAM
Radium 228	15262-20-1	U		0.77	0.20	U	GAM
Europium 152	14683-23-9	U		0.55	0.10	U	GAM
Europium 154	15585-10-1	U		0.59	0.10	U	GAM
Europium 155	14391-16-3	U		0.36	0.10	U	GAM
Thorium 228	14274-82-9	U		0.26		U	GAM
Thorium 232	TH-232	U		0.77		U I	GAM
Uranium 235	15117-96-1	U		0.53		U	GAM
Uranium 238	U-238	U		23		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM
Silver 108m	14391-65-2	U		0.12		U	GAM

100-F Remaining Sites Burial Grounds

4/1/06

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Protocol	Hanford
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Form	DVD-DS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-002 J112D4

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-02	Client sample id	J112D4		
Dept sample id	7726-002	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:20	590.6 g	
% solids	94.9	Custody/SAF No	RC-032-007	RC-032	

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	3.3	1.2			GAM
Cobalt 60	10198-40-0	U		0.11	0.050	U	GAM
Cesium 137	10045-97-3	U		0.092	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.19	0.19	0.10		GAM
Radium 228	15262-20-1	U		1.1	0.20	U	GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.32	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.521	0.17	0.18			GAM
Thorium 232	TH-232	U		1.1		U J	GAM
Uranium 235	15117-96-1	U		0.34		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM
Silver 108m	14391-65-2	U		0.065		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-003 J112D5

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-03	Client sample id	J112D5		
Dept sample id	7726-003	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:30	694.7 g	
% solids	92.8	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		16		U	GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.18	0.10	U	GAM
Radium 226	13982-63-3	U		0.76	0.10	U	GAM
Radium 228	15262-20-1	U		0.91	0.20	U	GAM
Europium 152	14683-23-9	U		0.25	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.27	0.10	U	GAM
Thorium 228	14274-82-9	0.526	0.22	0.12			GAM
Thorium 232	TH-232	U		0.91		U J	GAM
Uranium 235	15117-96-1	U		0.34		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM
Silver 108m	14391-65-2	U		0.074		U	GAM

100-F Remaining Sites Burial Grounds

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E B E R L I N E S E R V I C E S / R I C H M O N D

SAMPLE DELIVERY GROUP K0211

7726-004 J112D6

D A T A S H E E T

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-04	Client sample id	J112D6		
Dept sample id	7726-004	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:40	732.0 g	
% solids	97.7	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	15.4	2.2	0.93			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.635	0.21	0.22	0.10		GAM
Radium 228	15262-20-1	0.769	0.52	0.57	0.20		GAM
Europium 152	14683-23-9	U		0.29	0.10	U	GAM
Europium 154	15585-10-1	U		0.38	0.10	U	GAM
Europium 155	14391-16-3	U		0.24	0.10	U	GAM
Thorium 228	14274-82-9	0.507	0.16	0.18			GAM
Thorium 232	TH-232	0.769	0.52	0.57		J	GAM
Uranium 235	15117-96-1	U		0.35		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Silver 108m	14391-65-2	U		0.073		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-005 J112D7

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-05	Client sample id	J112D7		
Dept sample id	7726-005	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:50	707.5 g	
% solids	95.3	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	13.7	1.8	0.87			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.548	0.22	0.23	0.10		GAM
Radium 228	15262-20-1	U		0.87	0.20	U	GAM
Europium 152	14683-23-9	U		0.27	0.10	U	GAM
Europium 154	15585-10-1	U		0.34	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.597	0.11	0.11			GAM
Thorium 232	TH-232	U		0.87		U J	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.46		U	GAM
Silver 108m	14391-65-2	U		0.071		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-006 J112D8

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-06	Client sample id	J112D8		
Dept sample id	7726-006	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 09:00	712.2 g	
% solids	98.4	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	11.3	1.8	1.0			GAM
Cobalt 60	10198-40-0	U		0.16	0.050	U	GAM
Cesium 137	10045-97-3	U		0.14	0.10	U	GAM
Radium 226	13982-63-3	U		0.28	0.10	U	GAM
Radium 228	15262-20-1	U		0.68	0.20	U	GAM
Europium 152	14683-23-9	U		0.40	0.10	U	GAM
Europium 154	15585-10-1	U		0.52	0.10	U	GAM
Europium 155	14391-16-3	U		0.28	0.10	U	GAM
Thorium 228	14274-82-9	0.548	0.19	0.18			GAM
Thorium 232	TH-232	U		0.68		U J	GAM
Uranium 235	15117-96-1	U		0.44		U	GAM
Uranium 238	U-238	U		19		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM
Silver 108m	14391-65-2	U		0.10		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-007 J112D9

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-07	Client sample id	J112D9		
Dept sample id	7726-007	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 09:10	706.2 g	
% solids	97.1	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	11.8	3.2	0.83			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	U		0.089	0.10	U	GAM
Radium 226	13982-63-3	U		0.38	0.10	U	GAM
Radium 228	15262-20-1	U		0.81	0.20	U	GAM
Europium 152	14683-23-9	U		0.21	0.10	U	GAM
Europium 154	15585-10-1	U		0.32	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.565	0.17	0.16			GAM
Thorium 232	TH-232	U		0.81		U J	GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM
Silver 108m	14391-65-2	U		0.064		U	GAM

100-F Remaining Sites Burial Grounds

4/1/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-008 J112F0

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-08	Client sample id	J112F0		
Dept sample id	7726-008	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 09:20	754.9 g	
% solids	97.3	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		16		U	GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.090	0.10	U	GAM
Radium 226	13982-63-3	U		0.77	0.10	U	GAM
Radium 228	15262-20-1	U		1.3	0.20	U	GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.27	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	U		0.65		U	GAM
Thorium 232	TH-232	U		1.3		U J	GAM
Uranium 235	15117-96-1	U		0.30		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM
Silver 108m	14391-65-2	U		0.065		U	GAM

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-009 J112F1

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-09	Client sample id	J112F1		
Dept sample id	7726-009	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 09:30	811.9 g	
% solids	94.1	Custody/SAF No	RC-032-007	RC-032	

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	2.2	1.4			GAM
Cobalt 60	10198-40-0	U		0.094	0.050	U	GAM
Cesium 137	10045-97-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.546	0.20	0.19	0.10		GAM
Radium 228	15262-20-1	U		0.92	0.20	U	GAM
Europium 152	14683-23-9	U		0.34	0.10	U	GAM
Europium 154	15585-10-1	U		0.46	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.687	0.11	0.11			GAM
Thorium 232	TH-232	U		0.92		U J	GAM
Uranium 235	15117-96-1	U		0.40		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM
Silver 108m	14391-65-2	U		0.086		U	GAM

100-F Remaining Sites Burial Grounds

4/1/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/17/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-010 J112F2

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R602045-10	Client sample id	J112F2	
Dept sample id	7726-010	Location/Matrix	100-F-31 Excavation	SOLID
Received	02/08/06	Collected/Weight	02/06/06 09:40	853.0 g
% solids	95.6	Custody/SAF No	RC-032-007	RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	13.6	2.1	1.3			GAM
Cobalt 60	10198-40-0	U		0.095	0.050	U	GAM
Cesium 137	10045-97-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.714	0.19	0.15	0.10		GAM
Radium 228	15262-20-1	0.707	0.38	0.43	0.20		GAM
Europium 152	14683-23-9	U		0.28	0.10	U	GAM
Europium 154	15585-10-1	U		0.36	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.677	0.11	0.13			GAM
Thorium 232	TH-232	0.707	0.38	0.43		J	GAM
Uranium 235	15117-96-1	U		0.36		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.47		U	GAM
Silver 108m	14391-65-2	U		0.078		U	GAM

100-F Remaining Sites Burial Grounds

4/1/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/17/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-011 J112F3

DATA SHEET

SDG	7726	Client/Case no	Hanford	SDG K0211	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R602045-11	Client sample id	J112F3		
Dept sample id	7726-011	Location/Matrix	100-F-31 Excavation	SOLID	
Received	02/08/06	Collected/Weight	02/06/06 08:30	478.2 g	
% solids	94.6	Custody/SAF No	RC-032-007	RC-032	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	9.53	1.8	1.1			GAM
Cobalt 60	10198-40-0	U		0.17	0.050	U	GAM
Cesium 137	10045-97-3	U		0.17	0.10	U	GAM
Radium 226	13982-63-3	U		0.42	0.10	U	GAM
Radium 228	15262-20-1	U		0.75	0.20	U	GAM
Europium 152	14683-23-9	U		0.48	0.10	U	GAM
Europium 154	15585-10-1	U		0.55	0.10	U	GAM
Europium 155	14391-16-3	U		0.34	0.10	U	GAM
Thorium 228	14274-82-9	0.683	0.21	0.22			GAM
Thorium 232	TH-232	U		0.75		U J	GAM
Uranium 235	15117-96-1	U		0.51		U	GAM
Uranium 238	U-238	U		21		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Silver 108m	14391-65-2	U		0.12		U	GAM

100-F Remaining Sites Burial Grounds

4/1/06

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/17/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0211 was composed of eleven solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on February 17, 2006.

2.0 ANALYSIS NOTES

2.1 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

2/20/6

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 1 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation K0211 (7726)		SAF No. RC-032
Ice Chest No. AFS-04-022	Field Logbook No. EFL-1174	COA R10F312000	Method of Shipment FedEx
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060246		Bill of Lading/Air Bill No. See OSPC

Price Code 8C

Data Turnaround 15 days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ RES 2-7-06

None

000024

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	G/P	G/P	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1					
Volume	250g	60mL	60mL	120mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.					

1-26-06

Sample No.	Matrix *	Sample Date	Sample Time										
J112D3	SOIL	2-6-06	0810					X					
J112D4	SOIL	2-6-06	0820					X					
J112D5	SOIL	2-6-06	0830					X					
J112D6	SOIL	2-6-06	0840					X					
J112D7	SOIL	2-6-06	0860					X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1430	Received By/Stored In	Date/Time
[illegible] Stankovich	2/6/06	3728/2C	2/6/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728/2C	2-7-06 / 0930	R2 Stiffler R.J. Stiffler	0930 2-7-06
Relinquished By/Removed From	Date/Time 1500	Received By/Stored In	Date/Time
R2 Stiffler R.J. Stiffler	2-7-06	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex		Alex Kelleuly	2/8/06 10:00
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) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {~~Silver, 108 metastable~~} Am-241
MA 1/26/06

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/7/06

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)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 2 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15days	Air Quality: ☐	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation K0211 (7726)	SAF No.: RC-032	
Ice Chest No.: AFS-04-022	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060246	Bill of Lading/Air Bill No.: See OSFC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < PQT Limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ R25 2-7-06

None

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
J112D8	SOIL	2-6-06	0900					Y					
J112D9	SOIL	2-6-06	0910					Y					
J112F0	SOIL	2-6-06	0920					Y					
J112F1	SOIL	2-6-06	0930					Y					
J112F2	SOIL	2-6-06	0940					Y					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1430	Received By/Stored In	Date/Time
m2 Dm stankovich	2/6/06	3728/2C	2/6/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 0930
3728/2C 2-7-06	1630	R2 Steffler R.J. Steffler	2-7-06
Relinquished By/Removed From	Date/Time 1500	Received By/Stored In	Date/Time
R2 Steffler R.J. Steffler	2-7-06	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX		Alex Kelleely	2/8/06 10:00
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) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {~~Silver-108 metastable~~} Am-241
MA 1/26/06

Personnel not available to relinquish samples from 3728 Ref # 2C on 2/7/06

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)

000025

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 3 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Price Code 8C	Data Turnaround 15 days		
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation K0211 (7726)		SAF No. RC-032
Air Quality ☐			
Ice Chest No. AFS-04-022	Field Logbook No. EFL-1174	COA R10F312000	Method of Shipment FedEx
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A060246		Bill of Lading/Air Bill No. See OSPC

~~POSSIBLE SAMPLE HAZARDS/REMARKS~~

NA < DOT Limits

Special Handling and/or Storage

~~Cool 4 degrees C~~ R25 2-7-06

None

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	G/P	G/P	aG	aG	G/P					
No. of Container(s)	1	1	1	1	1					
Volume	250g	60mL	60mL	120mL	500mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.					

920000026

Sample No.	Matrix *	Sample Date	Sample Time										
J112F3	SOIL	2-6-06	0830					X					
~~J112F4~~	~~SOIL~~												
WO 2/6/06													

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1430	Received By/Stored In	Date/Time
MZC MStankovich	2/6/06	3728/2C	2/6/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 0930
3728/2C 2-7-06	0930	RZ Steffler RJ Steffler	2-7-06
Relinquished By/Removed From	Date/Time 1500	Received By/Stored In	Date/Time
RZ Steffler RJ Steffler	2-7-06	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX		Alex Rebenel	2/8/06 10:00
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) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {~~Silver-108 metastable~~} Am 241

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/7/06

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

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-F-31		DATA PACKAGE:	K0211, K0211	
VALIDATOR:	TZT	LAB:	FB	DATE:	4/1/06
			SDG:	K0211	

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

SAMPLES/MATRIX					
J112D3	J112D4	J112D5	J112D6	J112D7	J112D8
J112D9	J112F0	J112F1	J112F2	J112F3	
					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: th 232 - 45%. J all

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: SS over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-013 Method Blank

METHOD BLANK

SDG	7726	Client/Case no	Hanford SDG K0211
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R602045-13	Client sample id	Method Blank
Dept sample id	7726-013	Material/Matrix	SOLID
		SAF No	RC-032

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		2.1		U	GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.084	0.10	U	GAM
Radium 226	13982-63-3	U		0.17	0.10	U	GAM
Radium 228	15262-20-1	U		0.39	0.20	U	GAM
Europium 152	14683-23-9	U		0.20	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	U		0.11		U	GAM
Thorium 232	TH-232	U		0.39		U	GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM
Silver 108m	14391-65-2	U		0.060		U	GAM

100-F Remaining Sites Burial Grounds

QC-BLANK #56046

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/17/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-012

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7726

Contact Melissa C. Mannion

Client/Case no Hanford SDG K0211

Contract No. 630

Lab sample id R602045-12

Dept sample id 7726-012

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-032

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	3.21	0.24	0.070	0.050		GAM	3.39	0.14	95	75-125	80-120
Cesium 137	3.51	0.23	0.16	0.10		GAM	3.43	0.14	102	74-126	80-120

100-F Remaining Sites Burial Grounds

QC-LCS #56045

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/17/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0211

7726-014 J112D6

DUPLICATE

SDG	7726			Client/Case no	Hanford SDG K0211
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R602045-14	Lab sample id	R602045-04	Client sample id	J112D6
Dept sample id	7726-014	Dept sample id	7726-004	Location/Matrix	100-F-31 Excavation SOLID
		Received	02/08/06	Collected/Weight	02/06/06 08:40 732.0 g
% solids	97.7	% solids	97.7	Custody/SAF No	RC-032-007 RC-032

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
Potassium 40	13.4	1.3	0.73			GAM	15.4	2.2	0.93		14	42	1.0
Cobalt 60	U		0.065	0.050	U	GAM	U		0.12	U	-		0.8
Cesium 137	U		0.061	0.10	U	GAM	U		0.12	U	-		0.9
Radium 226	0.445	0.12	0.13	0.10		GAM	0.635	0.21	0.22		35	75	1.4
Radium 228	0.484	0.21	0.23	0.20		GAM	0.769	0.52	0.57		45	138	1.0
Europium 152	U		0.17	0.10	U	GAM	U		0.29	U	-		0.7
Europium 154	U		0.23	0.10	U	GAM	U		0.38	U	-		0.7
Europium 155	U		0.16	0.10	U	GAM	U		0.24	U	-		0.5
Thorium 228	0.555	0.073	0.078			GAM	0.507	0.16	0.18		9	59	0.5
Thorium 232	0.484	0.21	0.23			GAM	0.769	0.52	0.57		45	138	1.0
Uranium 235	U		0.21		U	GAM	U		0.35	U	-		0.7
Uranium 238	U		8.4		U	GAM	U		13	U	-		0.6
Americium 241	U		0.38		U	GAM	U		0.27	U	-		0.5
Silver 108m	U		0.047		U	GAM	U		0.073	U	-		0.6

100-F Remaining Sites Burial Grounds

QC-DUP#4 56047

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/17/06

Date: 4 April 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Site 100-F-31
Subject: Semivolatile - Data Package No. K0211-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0211 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
J112D3	2/6/06	Soil	C	See note 1
J112D4	2/6/06	Soil	C	See note 1
J112D5	2/6/06	Soil	C	See note 1
J112D6	2/6/06	Soil	C	See note 1
J112D7	2/6/06	Soil	C	See note 1
J112D8	2/6/06	Soil	C	See note 1
J112D9	2/6/06	Soil	C	See note 1
J112F0	2/6/06	Soil	C	See note 1
J112F1	2/6/06	Soil	C	See note 1
J112F2	2/6/06	Soil	C	See note 1
J112F3	2/6/06	Soil	C	See note 1
J112F4	2/6/06	Soil	C	See note 1

1 – Semivolatiles by 8270C.

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

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

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

All other method blank results were acceptable.

Field Blanks

One equipment blank (J112F4) were submitted for analysis. No analytes were detected in the equipment blank.

· **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike (55%), matrix spike duplicate (56%) and LCS (56%) results outside QC limits, the 1,2,4-trichlorobenzene results in all samples were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits, the 2,4-dimethylphenol results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J112D3/J112F3) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Ninety-six analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0211 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, detected di-n-butylphthalate and bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

- Due to matrix spike (55%), matrix spike duplicate (56%) and LCS (56%) results outside QC limits, the 1,2,4-trichlorobenzene results in all samples were qualified as estimates and flagged "J".

- Due to an LCS recovery outside QC limits, the 2,4-dimethylphenol 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

Ninety-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 validation SOW are as follows:

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0211	REVIEWER: Project: 100-F-31 TEI		PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	U at RQL	All detects	Blank contamination
1,2,4-Trichlorobenzene	J	All	MS and MSD recovery
1,2,4-Trichlorobenzene 2,4-Dimethylphenol	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

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K01211																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Extraction Date		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06	
Analysis Date		2/14/06		2/14/06		2/14/06		2/13/06		2/14/06		2/14/06		2/14/06		2/15/06		2/15/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
bis(2-Chloroethyl)ether	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2-Chlorophenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
1,3-Dichlorobenzene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
1,4-Dichlorobenzene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
1,2-Dichlorobenzene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2-Methylphenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,2'-oxybis(1-chloropropane)	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
3 and/or 4-Methylphenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
N-Nitroso-di-n-propylamine	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Hexachloroethane	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Nitrobenzene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Isophorone	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2-Nitrophenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4-Dimethylphenol	660	350	UJ	350	UJ	360	UJ	340	UJ	350	UJ	350	UJ	340	UJ	340	UJ	350	UJ
bis(2-Chloroethoxy)methane	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4-Dichlorophenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
1,2,4-Trichlorobenzene	660	350	UJ	350	UJ	360	UJ	340	UJ	350	UJ	350	UJ	340	UJ	340	UJ	350	UJ
Naphthalene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
4-Chloroaniline	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Hexachlorobutadiene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
4-Chloro-3-methylphenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2-Methylnaphthalene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Hexachlorocyclopentadiene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4,6-Trichlorophenol	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4,5-Trichlorophenol*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
2-Chloronaphthalene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2-Nitroaniline*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
Dimethylphthalate	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Acenaphthylene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,6-Dinitrotoluene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U

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.

* - RQL exceeded

000011

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K02111																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Extraction Date		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06		2/9/06	
Analysis Date		2/14/06		2/14/06		2/14/06		2/13/06		2/14/06		2/14/06		2/14/06		2/15/06		2/15/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
Acenaphthene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4-Dinitrophenol*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
4-Nitrophenol*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
Dibenzofuran	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
2,4-Dinitrotoluene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Diethylphthalate	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
4-Chlorophenyl-phenyl ether	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Fluorene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
4-Nitroaniline*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
4,6-Dinitro-2-methylphenol*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
N-Nitrosodiphenylamine	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
4-Bromophenyl-phenyl ether	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Hexachlorobenzene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Pentachlorophenol*	660	880	U	880	U	910	U	850	U	870	U	860	U	860	U	860	U	880	U
Phenanthrene	660	20		350	U	27		340	U	350	U	350	U	340	U	34		350	U
Anthracene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Carbazole	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Di-n-butylphthalate	660	350	U	660	U	660	U	340	U	660	U	350	U	660	U	660	U	660	U
Fluoranthene	660	40		24		53		340	U	34		350	U	340	U	88		37	
Pyrene	660	49		30		56		340	U	44		350	U	340	U	120		42	
Butylbenzylphthalate	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
3,3'-Dichlorobenzidine	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Benzo(a)anthracene	660	23		350	U	25		340	U	21		350	U	340	U	52		21	
Chrysene	660	33		23		37		340	U	30		350	U	340	U	63		28	
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Benzo(b)fluoranthene	660	350	U	350	U	23		340	U	18		350	U	340	U	35		350	U
Benzo(k)fluoranthene	660	350	U	350	U	22		340	U	21		350	U	340	U	42		19	
Benzo(a)pyrene	660	350	U	350	U	21		340	U	20		350	U	340	U	43		350	U
Indeno(1,2,3-cd)pyrene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	22		350	U
Dibenz(a,h)anthracene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	340	U	350	U
Benzo(g,h,i)perylene	660	350	U	350	U	360	U	340	U	350	U	350	U	340	U	23		350	U

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.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0211																		
Sample Number		J112F2		J112F3		J112F4													
Remarks				Duplicate		E. Blank													
Sample Date		2/6/06		2/6/06		2/6/06													
Extraction Date		2/9/06		2/9/06		2/9/06													
Analysis Date		2/14/06		2/15/06		2/15/06													
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	350	U	360	U	330	U												
bis(2-Chloroethyl)ether	660	350	U	360	U	330	U												
2-Chlorophenol	660	350	U	360	U	330	U												
1,3-Dichlorobenzene	660	350	U	360	U	330	U												
1,4-Dichlorobenzene	660	350	U	360	U	330	U												
1,2-Dichlorobenzene	660	350	U	360	U	330	U												
2-Methylphenol	660	350	U	360	U	330	U												
2,2'-oxybis(1-chloropropane)	660	350	U	360	U	330	U												
3 and/or 4-Methylphenol	660	350	U	360	U	330	U												
N-Nitroso-di-n-propylamine	660	350	U	360	U	330	U												
Hexachloroethane	660	350	U	360	U	330	U												
Nitrobenzene	660	350	U	360	U	330	U												
Isophorone	660	350	U	360	U	330	U												
2-Nitrophenol	660	350	U	360	U	330	U												
2,4-Dimethylphenol	660	350	UJ	360	UJ	330	UJ												
bis(2-Chloroethoxy)methane	660	350	U	360	U	330	U												
2,4-Dichlorophenol	660	350	U	360	U	330	U												
1,2,4-Trichlorobenzene	660	350	UJ	360	UJ	330	UJ												
Naphthalene	660	350	U	360	U	330	U												
4-Chloroaniline	660	350	U	360	U	330	U												
Hexachlorobutadiene	660	350	U	360	U	330	U												
4-Chloro-3-methylphenol	660	350	U	360	U	330	U												
2-Methylnaphthalene	660	350	U	360	U	330	U												
Hexachlorocyclopentadiene	660	350	U	360	U	330	U												
2,4,6-Trichlorophenol	660	350	U	360	U	330	U												
2,4,5-Trichlorophenol*	660	880	U	890	U	830	U												
2-Chloronaphthalene	660	350	U	360	U	330	U												
2-Nitroaniline*	660	880	U	890	U	830	U												
Dimethylphthalate	660	350	U	360	U	330	U												
Acenaphthylene	660	350	U	360	U	330	U												
2,6-Dinitrotoluene	660	350	U	360	U	330	U												

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.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0211																		
Sample Number		J112F2		J112F3		J112F4													
Remarks				Duplicate		E. Blank													
Sample Date		2/6/06		2/6/06		2/6/06													
Extraction Date		2/9/06		2/9/06		2/9/06													
Analysis Date		2/14/06		2/15/06		2/15/06													
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	880	U	890	U	830	U												
Acenaphthene	660	350	U	360	U	330	U												
2,4-Dinitrophenol*	660	880	U	890	U	830	U												
4-Nitrophenol*	660	880	U	890	U	830	U												
Dibenzofuran	660	350	U	360	U	330	U												
2,4-Dinitrotoluene	660	350	U	360	U	330	U												
Diethylphthalate	660	350	U	360	U	330	U												
4-Chlorophenyl-phenyl ether	660	350	U	360	U	330	U												
Fluorene	660	350	U	360	U	330	U												
4-Nitroaniline*	660	880	U	890	U	830	U												
4,6-Dinitro-2-methylphenol*	660	880	U	890	U	830	U												
N-Nitrosodiphenylamine	660	350	U	360	U	330	U												
4-Bromophenyl-phenyl ether	660	350	U	360	U	330	U												
Hexachlorobenzene	660	350	U	360	U	330	U												
Pentachlorophenol*	660	920	U	880	U	880	U												
Phenanthrene	660	30		21		330	U												
Anthracene	660	350	U	360	U	330	U												
Carbazole	660	350	U	360	U	330	U												
Di-n-butylphthalate	660	660	U	660	U	660	U												
Fluoranthene	660	83		38		330	U												
Pyrene	660	110		51		330	U												
Butylbenzylphthalate	660	350	U	360	U	330	U												
3,3'-Dichlorobenzidine	660	350	U	360	U	330	U												
Benzo(a)anthracene	660	54		21		330	U												
Chrysene	660	65		32		330	U												
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U												
Di-n-octylphthalate	660	350	U	360	U	330	U												
Benzo(b)fluoranthene	660	42		21		330	U												
Benzo(k)fluoranthene	660	48		23		330	U												
Benzo(a)pyrene	660	46		20		330	U												
Indeno(1,2,3-cd)pyrene	660	25		360	U	330	U												
Dibenz(a,h)anthracene	660	350	U	360	U	330	U												
Benzo(g,h,i)perylene	660	28		360	U	330	U												

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.

* - RQL exceeded

000014

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 02/17/06 13:19

RFW Batch Number: 0602L224 Client: TNU-HANFORD RC-032 Work Order: 11343606001 Page: 1a

000000007

	Cust ID:	J112D3		J112D3		J112D3		J112D4		J112D5		J112D6	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	67	%	54	%	52	%	63	%	80	%	71	%
	2-Fluorobiphenyl	68	%	73	%	70	%	59	%	72	%	66	%
	Terphenyl-d14	89	%	85	%	78	%	80	%	90	%	91	%
	Phenol-d5	75	%	82	%	75	%	68	%	88	%	79	%
	2-Fluorophenol	66	%	72	%	69	%	62	%	78	%	75	%
	2,4,6-Tribromophenol	85	%	99	%	93	%	75	%	92	%	80	%
			fl		fl		fl		fl		fl		fl
Phenol		350	U	89	%	89	%	350	U	360	U	340	U
bis(2-Chloroethyl)ether		350	U	81	%	81	%	350	U	360	U	340	U
2-Chlorophenol		350	U	83	%	82	%	350	U	360	U	340	U
1,3-Dichlorobenzene		350	U	73	%	74	%	350	U	360	U	340	U
1,4-Dichlorobenzene		350	U	73	%	73	%	350	U	360	U	340	U
1,2-Dichlorobenzene		350	U	77	%	78	%	350	U	360	U	340	U
2-Methylphenol		350	U	86	%	82	%	350	U	360	U	340	U
2,2'-oxybis(1-Chloropropane)		350	U	79	%	79	%	350	U	360	U	340	U
4-Methylphenol		350	U	95	%	90	%	350	U	360	U	340	U
N-Nitroso-di-n-propylamine		350	U	86	%	84	%	350	U	360	U	340	U
Hexachloroethane		350	U	71	%	71	%	350	U	360	U	340	U
Nitrobenzene		350	U	57	%	57	%	350	U	360	U	340	U
Isophorone		350	U	66	%	66	%	350	U	360	U	340	U
2-Nitrophenol		350	U	58	%	59	%	350	U	360	U	340	U
2,4-Dimethylphenol		350	U J	63	%	56	%	350	U J	360	U J	340	U J
bis(2-Chloroethoxy)methane		350	U	61	%	62	%	350	U	360	U	340	U
2,4-Dichlorophenol		350	U	64	%	63	%	350	U	360	U	340	U
1,2,4-Trichlorobenzene		350	U J	55 *	%	56 *	%	350	U J	360	U J	340	U J
Naphthalene		350	U	56	%	56	%	350	U	360	U	340	U
4-Chloroaniline		350	U	68	%	66	%	350	U	360	U	340	U
Hexachlorobutadiene		350	U	59	%	61	%	350	U	360	U	340	U
4-Chloro-3-methylphenol		350	U	73	%	72	%	350	U	360	U	340	U
2-Methylnaphthalene		350	U	62	%	61	%	350	U	360	U	340	U
Hexachlorocyclopentadiene		350	U	65	%	67	%	350	U	360	U	340	U
2,4,6-Trichlorophenol		350	U	102	%	103	%	350	U	360	U	340	U
2,4,5-Trichlorophenol		880	U	83	%	84	%	880	U	910	U	850	U

*= Outside of EPA CLP QC limits.

4/1/06

000015

RFW Batch Number: 0602L224 Client: IND-HANFORD RC-032 Work Order: 1434500001 Page: 1B

Cust ID:	J112D3		J112D3		J112D3		J112D4		J112D5		J112D6	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	350	U	81	%	82	%	350	U	360	U	340	U
2-Nitroaniline	880	U	90	%	89	%	880	U	910	U	850	U
Dimethylphthalate	350	U	88	%	89	%	350	U	360	U	340	U
Acenaphthylene	350	U	81	%	81	%	350	U	360	U	340	U
2,6-Dinitrotoluene	350	U	89	%	89	%	350	U	360	U	340	U
3-Nitroaniline	880	U	93	%	96	%	880	U	910	U	850	U
Acenaphthene	350	U	80	%	81	%	350	U	360	U	340	U
2,4-Dinitrophenol	880	U	56	%	66	%	880	U	910	U	850	U
4-Nitrophenol	880	U	83	%	85	%	880	U	910	U	850	U
Dibenzofuran	350	U	84	%	84	%	350	U	360	U	340	U
2,4-Dinitrotoluene	350	U	91	%	93	%	350	U	360	U	340	U
Diethylphthalate	350	U	85	%	88	%	350	U	360	U	340	U
4-Chlorophenyl-phenylether	350	U	84	%	84	%	350	U	360	U	340	U
Fluorene	350	U	82	%	82	%	350	U	360	U	340	U
4-Nitroaniline	880	U	80	%	86	%	880	U	910	U	850	U
4,6-Dinitro-2-methylphenol	880	U	84	%	86	%	880	U	910	U	850	U
N-Nitrosodiphenylamine (1)	350	U	69	%	69	%	350	U	360	U	340	U
4-Bromophenyl-phenylether	350	U	75	%	74	%	350	U	360	U	340	U
Hexachlorobenzene	350	U	84	%	84	%	350	U	360	U	340	U
Pentachlorophenol	880	U	94	%	104	%	880	U	910	U	850	U
Phenanthrene	20	J	83	%	83	%	350	U	27	J	340	U
Anthracene	350	U	84	%	85	%	350	U	360	U	340	U
Carbazole	350	U	81	%	87	%	350	U	360	U	340	U
Di-n-butylphthalate	350	U	77	%	83	%	660 ~~20~~ 4/1/06 ~~JB~~ U		660 ~~24~~ 4/1/06 ~~JB~~ U		340	U
Fluoranthene	40	J	76	%	87	%	24	J	53	J	340	U
Pyrene	49	J	85	%	83	%	30	J	56	J	340	U
Butylbenzylphthalate	350	U	89	%	92	%	350	U	360	U	340	U
3,3'-Dichlorobenzidine	350	U	64	%	73	%	350	U	360	U	340	U
Benzo(a)anthracene	23	J	85	%	85	%	350	U	25	J	340	U
Chrysene	33	J	83	%	84	%	23	J	37	J	340	U
bis(2-Ethylhexyl)phthalate	660 ~~65~~ 4/1/06 ~~JB~~ U		90	%	95	%	660 ~~57~~ 4/1/06 ~~JB~~ U		660 ~~62~~ 4/1/06 ~~JB~~ U		660 ~~29~~ 4/1/06 ~~JB~~ U	
Di-n-octyl phthalate	350	U	92	%	99	%	350	U	360	U	340	U
Benzo(b)fluoranthene	350	U	83	%	85	%	350	U	23	J	340	U
Benzo(k)fluoranthene	350	U	79	%	81	%	350	U	22	J	340	U
Benzo(a)pyrene	350	U	81	%	83	%	350	U	21	J	340	U
Indeno(1,2,3-cd)pyrene	350	U	85	%	85	%	350	U	360	U	340	U
Dibenz(a,h)anthracene	350	U	83	%	84	%	350	U	360	U	340	U
Benzo(g,h,i)perylene	350	U	82	%	83	%	350	U	360	U	340	U

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

4/1/06

000000008

000016

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 02/17/06 13:19

RFW Batch Number: 0602L224 Client: TNU-HANFORD RC-032 Work Order: 11343606001 Page: 2a

	Cust ID:	J112D7		J112D8		J112D9		J112F0		J112F1		J112F2	
Sample Information	RFW#:	005		006		007		008		009		010	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	57	%	50	%	67	%	66	%	70	%	73	%
	2-Fluorobiphenyl	61	%	49	%	66	%	62	%	67	%	72	%
	Terphenyl-d14	88	%	85	%	80	%	85	%	88	%	89	%
	Phenol-d5	67	%	54	%	73	%	74	%	80	%	82	%
	2-Fluorophenol	57	%	38	%	68	%	65	%	73	%	75	%
	2,4,6-Tribromophenol	89	%	55	%	74	%	79	%	86	%	92	%
			fl		fl		fl		fl		fl		fl
Phenol		350	U	350	U	340	U	340	U	350	U	350	U
bis(2-Chloroethyl)ether		350	U	350	U	340	U	340	U	350	U	350	U
2-Chlorophenol		350	U	350	U	340	U	340	U	350	U	350	U
1,3-Dichlorobenzene		350	U	350	U	340	U	340	U	350	U	350	U
1,4-Dichlorobenzene		350	U	350	U	340	U	340	U	350	U	350	U
1,2-Dichlorobenzene		350	U	350	U	340	U	340	U	350	U	350	U
2-Methylphenol		350	U	350	U	340	U	340	U	350	U	350	U
2,2'-oxybis(1-Chloropropane)		350	U	350	U	340	U	340	U	350	U	350	U
4-Methylphenol		350	U	350	U	340	U	340	U	350	U	350	U
N-Nitroso-di-n-propylamine		350	U	350	U	340	U	340	U	350	U	350	U
Hexachloroethane		350	U	350	U	340	U	340	U	350	U	350	U
Nitrobenzene		350	U	350	U	340	U	340	U	350	U	350	U
Isophorone		350	U	350	U	340	U	340	U	350	U	350	U
2-Nitrophenol		350	U	350	U	340	U	340	U	350	U	350	U
2,4-Dimethylphenol		350	U J	350	U J	340	U J	340	U J	350	U J	350	U J
bis(2-Chloroethoxy)methane		350	U	350	U	340	U	340	U	350	U	350	U
2,4-Dichlorophenol		350	U	350	U	340	U	340	U	350	U	350	U
1,2,4-Trichlorobenzene		350	U J	350	U J	340	U J	340	U J	350	U J	350	U J
Naphthalene		350	U	350	U	340	U	340	U	350	U	350	U
4-Chloroaniline		350	U	350	U	340	U	340	U	350	U	350	U
Hexachlorobutadiene		350	U	350	U	340	U	340	U	350	U	350	U
4-Chloro-3-methylphenol		350	U	350	U	340	U	340	U	350	U	350	U
2-Methylnaphthalene		350	U	350	U	340	U	340	U	350	U	350	U
Hexachlorocyclopentadiene		350	U	350	U	340	U	340	U	350	U	350	U
2,4,6-Trichlorophenol		350	U	350	U	340	U	340	U	350	U	350	U
2,4,5-Trichlorophenol		870	U	860	U	860	U	860	U	880	U	880	U

*= Outside of EPA CLP QC limits.

R 4/1/06

000017

000000009

Cust ID:	J112D7		J112D8		J112D9		J112F0		J112F1		J112F2	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	350	U	350	U	340	U	340	U	350	U	350	U
2-Nitroaniline	870	U	860	U	860	U	860	U	880	U	880	U
Dimethylphthalate	350	U	350	U	340	U	340	U	350	U	350	U
Acenaphthylene	350	U	350	U	340	U	340	U	350	U	350	U
2,6-Dinitrotoluene	350	U	350	U	340	U	340	U	350	U	350	U
3-Nitroaniline	870	U	860	U	860	U	860	U	880	U	880	U
Acenaphthene	350	U	350	U	340	U	340	U	350	U	350	U
2,4-Dinitrophenol	870	U	860	U	860	U	860	U	880	U	880	U
4-Nitrophenol	870	U	860	U	860	U	860	U	880	U	880	U
Dibenzofuran	350	U	350	U	340	U	340	U	350	U	350	U
2,4-Dinitrotoluene	350	U	350	U	340	U	340	U	350	U	350	U
Diethylphthalate	350	U	350	U	340	U	340	U	350	U	350	U
4-Chlorophenyl-phenylether	350	U	350	U	340	U	340	U	350	U	350	U
Fluorene	350	U	350	U	340	U	340	U	350	U	350	U
4-Nitroaniline	870	U	860	U	860	U	860	U	880	U	880	U
4,6-Dinitro-2-methylphenol	870	U	860	U	860	U	860	U	880	U	880	U
N-Nitrosodiphenylamine (1)	350	U	350	U	340	U	340	U	350	U	350	U
4-Bromophenyl-phenylether	350	U	350	U	340	U	340	U	350	U	350	U
Hexachlorobenzene	350	U	350	U	340	U	340	U	350	U	350	U
Pentachlorophenol	870	U	860	U	860	U	860	U	880	U	880	U
Phenanthrene	350	U	350	U	340	U	34	J	350	U	30	J
Anthracene	350	U	350	U	340	U	340	U	350	U	350	U
Carbazole	350	U	350	U	340	U	340	U	350	U	350	U
Di-n-butylphthalate	660 ~~21~~ JB 4/1/06	U	350	U	660 ~~31~~ JB 4/1/06	U	660 ~~38~~ JB 4/1/06	U	660 ~~22~~ JB 4/1/06	U	660 ~~30~~ JB 4/1/06	U
Fluoranthene	34	J	350	U	340	U	88	J	37	J	83	J
Pyrene	44	J	350	U	340	U	120	J	42	J	110	J
Butylbenzylphthalate	350	U	350	U	340	U	340	U	350	U	350	U
3,3'-Dichlorobenzidine	350	U	350	U	340	U	340	U	350	U	350	U
Benzo(a)anthracene	21	J	350	U	340	U	52	J	21	J	54	J
Chrysene	30	J	350	U	340	U	63	J	28	J	65	J
bis(2-Ethylhexyl)phthalate	660 ~~54~~ JB 4/1/06	U	660 ~~23~~ JB 4/1/06	U	660 ~~43~~ JB 4/1/06	U	660 ~~55~~ JB 4/1/06	U	660 ~~49~~ JB 4/1/06	U	660 ~~34~~ JB 4/1/06	U
Di-n-octyl phthalate	350	U	350	U	340	U	340	U	350	U	350	U
Benzo(b)fluoranthene	18	J	350	U	340	U	35	J	350	U	42	J
Benzo(k)fluoranthene	21	J	350	U	340	U	42	J	19	J	48	J
Benzo(a)pyrene	20	J	350	U	340	U	43	J	350	U	46	J
Indeno(1,2,3-cd)pyrene	350	U	350	U	340	U	22	J	350	U	25	J
Dibenz(a,h)anthracene	350	U	350	U	340	U	340	U	350	U	350	U
Benzo(g,h,i)perylene	350	U	350	U	340	U	23	J	350	U	28	J

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

K 4/1/06

	Cust ID:	J112F3	J112F4	SBLKTQ	SBLKTQ BS
Sample Information	RFW#:	011	012	06LE0105-MB1	06LE0105-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	68 %	76 %	65 %	55 %
	2-Fluorobiphenyl	67 %	71 %	61 %	71 %
	Terphenyl-d14	96 %	103 %	92 %	77 %
	Phenol-d5	79 %	85 %	74 %	82 %
	2-Fluorophenol	66 %	80 %	67 %	79 %
	2,4,6-Tribromophenol	89 %	87 %	74 %	87 %
Phenol		360 U	330 U	330 U	89 %
bis(2-Chloroethyl)ether		360 U	330 U	330 U	83 %
2-Chlorophenol		360 U	330 U	330 U	86 %
1,3-Dichlorobenzene		360 U	330 U	330 U	80 %
1,4-Dichlorobenzene		360 U	330 U	330 U	77 %
1,2-Dichlorobenzene		360 U	330 U	330 U	81 %
2-Methylphenol		360 U	330 U	330 U	81 %
2,2'-oxybis(1-Chloropropane)		360 U	330 U	330 U	82 %
4-Methylphenol		360 U	330 U	330 U	88 %
N-Nitroso-di-n-propylamine		360 U	330 U	330 U	82 %
Hexachloroethane		360 U	330 U	330 U	77 %
Nitrobenzene		360 U	330 U	330 U	57 %
Isophorone		360 U	330 U	330 U	64 %
2-Nitrophenol		360 U	330 U	330 U	58 %
2,4-Dimethylphenol		360 U J	330 U J	330 U	47 * %
bis(2-Chloroethoxy)methane		360 U	330 U	330 U	61 %
2,4-Dichlorophenol		360 U	330 U	330 U	61 %
1,2,4-Trichlorobenzene		360 U J	330 U J	330 U	56 * %
Naphthalene		360 U	330 U	330 U	56 %
4-Chloroaniline		360 U	330 U	330 U	74 %
Hexachlorobutadiene		360 U	330 U	330 U	60 %
4-Chloro-3-methylphenol		360 U	330 U	330 U	68 %
2-Methylnaphthalene		360 U	330 U	330 U	60 %
Hexachlorocyclopentadiene		360 U	330 U	330 U	59 %
2,4,6-Trichlorophenol		360 U	330 U	330 U	95 %
2,4,5-Trichlorophenol		890 U	830 U	830 U	76 %

*= Outside of EPA CLP QC limits.

4/1/06

000019

000000011

RFW Batch Number: 0602L224 Client: TNU-HANFORD RC-032 Work Order: [illegible]

Cust ID:	J112F3		J112F4		SBLKTQ		SBLKTQ BS	
RFW#:	011		012		06LE0105-MB1		06LE0105-MB1	
2-Chloronaphthalene	360	U	330	U	330	U	76	%
2-Nitroaniline	890	U	830	U	830	U	82	%
Dimethylphthalate	360	U	330	U	330	U	81	%
Acenaphthylene	360	U	330	U	330	U	76	%
2,6-Dinitrotoluene	360	U	330	U	330	U	82	%
3-Nitroaniline	890	U	830	U	830	U	97	%
Acenaphthene	360	U	330	U	330	U	75	%
2,4-Dinitrophenol	890	U	830	U	830	U	25	%
4-Nitrophenol	890	U	830	U	830	U	92	%
Dibenzofuran	360	U	330	U	330	U	78	%
2,4-Dinitrotoluene	360	U	330	U	330	U	87	%
Diethylphthalate	360	U	330	U	330	U	81	%
4-Chlorophenyl-phenylether	360	U	330	U	330	U	79	%
Fluorene	360	U	330	U	330	U	77	%
4-Nitroaniline	890	U	830	U	830	U	88	%
4,6-Dinitro-2-methylphenol	890	U	830	U	830	U	69	%
N-Nitrosodiphenylamine (1)	360	U	330	U	330	U	60	%
4-Bromophenyl-phenylether	360	U	330	U	330	U	66	%
Hexachlorobenzene	360	U	330	U	330	U	75	%
Pentachlorophenol	890	U	830	U	830	U	73	%
Phenanthrene	21	J	330	U	330	U	76	%
Anthracene	360	U	330	U	330	U	78	%
Carbazole	360	U	330	U	330	U	80	%
Di-n-butylphthalate	660 ~~35~~ JB 4/1/02 U		660 ~~40~~ JB 4/1/02 U		19	J	74	%
Fluoranthene	38	J	330	U	330	U	78	%
Pyrene	51	J	330	U	330	U	77	%
Butylbenzylphthalate	360	U	330	U	330	U	82	%
3,3'-Dichlorobenzidine	360	U	330	U	330	U	82	%
Benzo(a)anthracene	21	J	330	U	330	U	79	%
Chrysene	32	J	330	U	330	U	77	%
bis(2-Ethylhexyl)phthalate	660 ~~84~~ JB 4/1/02 U		660 ~~22~~ JB 4/1/02 U		38	J	83	%
Di-n-octyl phthalate	360	U	330	U	330	U	87	%
Benzo(b)fluoranthene	21	J	330	U	330	U	76	%
Benzo(k)fluoranthene	23	J	330	U	330	U	81	%
Benzo(a)pyrene	20	J	330	U	330	U	77	%
Indeno(1,2,3-cd)pyrene	360	U	330	U	330	U	78	%
Dibenz(a,h)anthracene	360	U	330	U	330	U	76	%
Benzo(g,h,i)perylene	360	U	330	U	330	U	76	%

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

4/1/02

000000012

000020

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-032
LVL #: 0602L224
SDG/SAF # K0211/RC-032

W.O. #: 11343-606-001-9999-00
Date Received: 02-08-2006

SEMIVOLATILE

Twelve (12) soil samples were collected on 02-06-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 02-09-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 02-13,14,15-2006.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Two (2) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.

   Two (2) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. 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.
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.

for Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/22/06
Date

som\group\data\bna\tnu-hanford\0602-224.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 31 pages.

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MS056

Initiator: Shawn Saylor
Date: 2-17-06
Client: TMW

Batch: 06021224
Samples: MS/MSD
Method: ~~SW846/MCAWW/CLP/~~

Parameter: 8270
Matrix: SOLID
Prep Batch: 06LE0105

1. Reason for SDR

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

b. General Discrepancy

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

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

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

low recovery of by 2,4-trichlorobenzene in matrix spike & matrix spike dup &
low recovery of 2,4-dimethylphenol + 1,2,4 Trichlorobenzene in the BS

2. Known or Probable Causes(s)

loss during extraction

3. Discussion and Proposed Action Other Description:

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

narrate

2/17/06

4. Project Manager Instructions...signature/date: _____

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

Not an extraction problem all other recoveries are very good. Sporadic.

CARRY ON

5. Final Action...signature/date: 2/22/06 Other Explanation: 2/17/2006

__ 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
1	X Project Mgr: Stone/Johnson		__ GC/LC: Kiger
__	__ Data Management: Stilwell	2	X MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-in: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 1 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 days		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	Air Quality: L
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
J112D3	SOIL	2-6-06	0810	X	X	X	X				
J112D4	SOIL	2-6-06	0820	X	X	X	X				
J112D5	SOIL	2-6-06	0830	X	X	X	X				
J112D6	SOIL	2-6-06	0840	X	X	X	X				
J112D7	SOIL	2-6-06	0850	X	X	X	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MJK m Stankovich	1430 2/6/06	3728/RC	2/6/06 1430
3728/RC	2-7-06 1000	RZ Steffler R.J. Steffler	1000 2-7-06
RZ Steffler R.J. Steffler	1500 2-7-06	Fed Ex	
Fed Ex	2-8-06 1000	V Nemoy	2-8-06 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 26 on 2/7/06

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)

000024

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 2 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman Telephone No. 528-6409	Project Coordinator KESSNER, JH	Price Code 8C Data Turnaround Air Quality 15 Day
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation	SAF No. RC-032	
Ice Chest No. AFS-04-001	Field Logbook No. EFL-1174 COA R10F312000	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060282	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions						
Sample No. / Matrix * / Sample Date / Sample Time											
J112D8 / SOIL / 2-6-06 / 0900	X	X	X	X							
J112D9 / SOIL / 2-6-06 / 0910	X	X	X	X							
J112F0 / SOIL / 2-6-06 / 0920	X	X	X	X							
J112F1 / SOIL / 2-6-06 / 0930	X	X	X	X							
J112F2 / SOIL / 2-6-06 / 0940	X	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1430	Received By/Stored In	Date/Time
MLL mstankovich	2/6/06	3728/2C	2/6/06 1430
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 1000
3728/2C	2-7-06 1000	RZ Steffler RJ Steffler	2-7-06
Relinquished By/Removed From	Date/Time 1500	Received By/Stored In	Date/Time
RZ Steffler RJ Steffler	2-7-06	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	2-8-06 1000	J Niemandy	2-8-06 1000
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) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/2/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
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)

000025

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 3 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 day	Air Quality:	
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No. / Matrix * / Sample Date / Sample Time											
J112F3 / SOIL / 2-6-06 / 0810	X	X	X	X							
J112F4 / SOIL / 2-6-06 / 0800	X			X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: MZL mstankovich	1430 2/6/06	Received By/Stored In: 3728/2C	2/6/06 1430
Relinquished By/Removed From: 3728/2C	2-7-06 1000	Received By/Stored In: RZ Stiffler R.J. Stiffler	10:00 2-7-06
Relinquished By/Removed From: RZ Stiffler R.J. Stiffler	1500 2-7-06	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	2-8-06 1000	Received By/Stored In: V. Hermann	2-8-06 1000
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 2C on 2/7/06

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)

000026

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-F-31			DATA PACKAGE: K0211		
VALIDATOR: JLI		LAB: LLI		DATE: 4/1/08	
			SDG: K0211		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J112D3	J112D4	J112D5	J112D6	J112D7	
J112D8	J112D9	J112F0	J112F1	J112F2	
J112F3	J112F4				
				soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: di-n-butylphthalate – U all dilution at RQL
bis(2-ethylhexyl)phthalate – U all dilution at RQL

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: 1,2,4-trichlorobenzene – MS/MSD – J all + LCS
2,4-dimethylphenol – LCS – J all

no PES

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

MS/MSD RPD values acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

Internal standard retention times acceptable? ..... Yes No N/A

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

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

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

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

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

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

Comments: 96 over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Date: 4 April 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste Sites 100-F-31
Subject: Wet Chemistry - Data Package No. K0211-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0211 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
J112D3	2/6/06	Soil	C	See note 1
J112D4	2/6/06	Soil	C	See note 1
J112D5	2/6/06	Soil	C	See note 1
J112D6	2/6/06	Soil	C	See note 1
J112D7	2/6/06	Soil	C	See note 1
J112D8	2/6/06	Soil	C	See note 1
J112D9	2/6/06	Soil	C	See note 1
J112F0	2/6/06	Soil	C	See note 1
J112F1	2/6/06	Soil	C	See note 1
J112F2	2/6/06	Soil	C	See note 1
J112F3	2/6/06	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 (J112D3/J112F3) 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 K0211 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: K0211	REVIEWER: TLI	PROJECT: 100-F-31	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: K0211																		
Sample Number		J112D3		J112D4		J112D5		J112D6		J112D7		J112D8		J112D9		J112F0		J112F1	
Remarks																			
Sample Date		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06		2/6/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.47		0.27		0.36		0.20	U	0.21	U	0.21	U	0.36		0.23		0.26	
Sample Number		J112F2		J112F3															
Remarks				Duplicate															
Sample Date		2/6/06		2/6/06															
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q										
Chromium VI	0.5	0.21	U	0.55															

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 02/15/06

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J112D3	% Solids	94.2	%	0.01	1.0
		Chromium VI	0.47	MG/KG	0.21	1.0
-002	J112D4	% Solids	95.0	%	0.01	1.0
		Chromium VI	0.27	MG/KG	0.21	1.0
-003	J112D5	% Solids	91.7	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.22	1.0
-004	J112D6	% Solids	97.9	%	0.01	1.0
		Chromium VI	0.20 u	MG/KG	0.20	1.0
-005	J112D7	% Solids	95.3	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-006	J112D8	% Solids	96.4	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0
-007	J112D9	% Solids	96.8	%	0.01	1.0
		Chromium VI	0.36	MG/KG	0.21	1.0
-008	J112F0	% Solids	97.0	%	0.01	1.0
		Chromium VI	0.23	MG/KG	0.21	1.0
-009	J112F1	% Solids	94.3	%	0.01	1.0
		Chromium VI	0.26	MG/KG	0.21	1.0
-010	J112F2	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.21 u	MG/KG	0.21	1.0

4/1/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/15/06

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J112F3	% Solids	93.8	%	0.01	1.0
		Chromium VI	0.55	MG/KG	0.21	1.0
-012	J112F4	% Solids	100	%	0.01	1.0

4/11/06

4/11/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-032 K0211
LVL#: 0602L224

W.O.#: 11343-606-001-9999-00
Date Received: 02-08-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 12 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 analyses for Chromium VI and Percent Solids were within the 20% Relative Percent Difference (RPD) control limit.

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

2/24/06
Date

njp\i02-224

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 16 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-032-007	Page 1 of 1

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman — Telephone No.: 528-6409	Project Coordinator: KESSNER, JH	Price Code: 8C — Data Turnaround: 15 days
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	Air Quality: ☐
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174 — COA: R10F312000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

cool 4 degrees C

SAMPLE ANALYSIS												
Preservation				None	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container				G/P	G/P	aG	aG	G/P				
No. of Container(s)				1	1	1	1	1				
Volume				250g	60mL	60mL	120mL	500mL				
				See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (1) in Special Instructions				
Sample No.	Matrix *	Sample Date	Sample Time									
J112D3	SOIL	2-6-06	0810	X	X	X	X					
J112D4	SOIL	2-6-06	0820	X	X	X	X					
J112D5	SOIL	2-6-06	0830	X	X	X	X					
J112D6	SOIL	2-6-06	0840	X	X	X	X					
J112D7	SOIL	2-6-06	0850	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	M Stankovich	2/6/06 1430	3728/RC	2/6/06 1430
Relinquished By/Removed From	3728/RC	2-7-06 1000	RZ Stoffle / R.J. Stoffle	2-7-06 1000
Relinquished By/Removed From	RZ Stoffle / R.J. Stoffle	2-7-06 1560	Fed Ex	
Relinquished By/Removed From	Fed Ex	2-8-06 1000	W Hemmer	2-8-06 1000
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728
Ref # 26 on 2/7/06

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

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

000015

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 2 of 3

Collector Coffman/Stankovich	Company Contact R.T. Coffman	Telephone No. 528-6409	Project Coordinator KESSNER, JH
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location 100-F-31 Excavation		SAF No. RC-032
Ice Chest No. AFS-04-001	Field Logbook No. EFL-1174	COA R10F312000	Method of Shipment FedEx
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A060282		Bill of Lading/Air Bill No. See OSPC

Price Code 8C

Data Turnaround 15 days

Air Quality

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	G/P	G/P	aG	aG	G/P						
No. of Container(s)	1	1	1	1	1						
Volume	250g	60mL	60mL	120mL	500mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.						
Sample No. / Matrix * / Sample Date / Sample Time											
J112D8 / SOIL / 2-6-06 / 0900	X	X	X	X							
J112D9 / SOIL / 2-6-06 / 0910	X	X	X	X							
J112F0 / SOIL / 2-6-06 / 0920	X	X	X	X							
J112F1 / SOIL / 2-6-06 / 0930	X	X	X	X							
J112F2 / SOIL / 2-6-06 / 0940	X	X	X	X							

000016

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MLK in Stankovich	2/6/06 1430	3728/2C	2/6/06 1830
3728/2C	2-7-06 1000	RZ Steffler RZ Steffler	2-7-06 1000
RZ Steffler RZ Steffler	2-7-06 1500	Fed Ex	
Fed Ex	2-8-06 1000	Nicholas	2-8-06 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/7/06

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)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-032-007	Page 3 of 3

Collector: Coffman/Stankovich	Company Contact: R.T. Coffman	Telephone No.: 528-6409	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 days		
Project Designation: 100-F Remaining Sites Burial Grounds - Soil Full Protocol	Sampling Location: 100-F-31 Excavation	SAF No.: RC-032	Air Quality:
Ice Chest No.: AFS-04-001	Field Logbook No.: EFL-1174	COA: R10F312000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060282	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA < DOT Limits

Special Handling and/or Storage

Cool 4 degrees C

SAMPLE ANALYSIS													
Preservation				None	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container				G/P	G/P	aG	aG	G/P					
No. of Container(s)				1	1	1	1	1					
Volume				250g	60mL	60mL	120mL	500mL					
				See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Semi-VOA - 8270A (TCL)	See item (2) in Special Instructions.					
Sample No.	Matrix *	Sample Date	Sample Time										
J112F3	SOIL	2-6-06	0810	X	X	X	X						
J112F4	SOIL	2-6-06	0800	X			X						

000017

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: M2C M. Stankovich	2/6/06 1430	Received By/Stored In: 3728/2C	2/6/06 1430
Relinquished By/Removed From: 3728/2C	2-7-06 1000	Received By/Stored In: R2 Stiffler	2-7-06 1000
Relinquished By/Removed From: R2 Stiffler	2-7-06 1500	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	2-8-06 1000	Received By/Stored In: V. Hernandez	2-8-06 1000
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) {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 - 7470 - (CV)
(2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable}

Personnel not available to relinquish samples from 3728 Ref # 2C on 2/7/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
W/C=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-F-31			DATA PACKAGE: K0211		
VALIDATOR: TLT		LAB: LLC		DATE: 4/1/02	
			SDG: K0211		
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					
J112D3	J112D4	J112D5	J112D6	J112D7	J112D8
J112D9	J112F0	J112F1	J112F2	J112F3	
					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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/15/06

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI007-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/15/06

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-006	J112D8	Soluble Chromium VI	4.3	0.21u	4.2	101.0	1.0
		Insoluble Chromium VI	1290	0.21u	1160	111.5	100
BLANK10	06LVI007-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.2	1.0
		Insoluble Chromium VI	1110	0.20u	1020	108.4	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/15/06

CLIENT: TNU-HANFORD RC-032 LVL LOT #: 0602L224

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-006REP	J112D8	Chromium VI	0.21u	0.21u	NC	1.0
-012REP	J112F4	% Solids	100	100	0.00	1.0