

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

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02

mip 1-19-06
INITIAL/DATE

COMMENTS:

SDG **K0093** SAF-RC-029

Waste Site: 100-D-24

RECEIVED
FEB 07 2006
EDMC

Date: 5 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-24
Subject: Inorganics - Data Package No. K0093-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0093 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
J10D47	11/3/05	Soil	C	See note 1
J10D48	11/3/05	Soil	C	See note 1
J10D49	11/3/05	Soil	C	See note 1
J10D50	11/3/05	Soil	C	See note 1

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

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) 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.

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· 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 boron results in samples J10D49 and J10D50 were qualified as estimates and flagged "UJ".

Due to method blank contamination, the sodium result in sample J10D49 was qualified as an estimate and flagged "J".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J10D49) was submitted for analysis. Aluminum, barium, calcium, iron, potassium, magnesium, manganese, silicon 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

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

Due to a matrix spike recovery outside QC limits (59.1%), all calcium results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (58.5%), 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 (J10D47/J10D48) 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 remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

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Completeness

Data package No. K0093 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 outside QC limits (59.1%), all calcium results were qualified as estimates and flagged "J".
- Due to method blank contamination, the boron results in samples J10D49 and J10D50 were qualified as estimates and flagged "UJ".
- Due to method blank contamination, the sodium result in sample J10D49 was qualified as an estimate and flagged "J".
- Due to a matrix spike recovery outside QC limits (58.5%), 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.

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.

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Appendix 1

Glossary of Data Reporting Qualifiers

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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).

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Appendix 2
Summary of Data Qualification

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METALS DATA QUALIFICATION SUMMARY*

SDG: K0038		REVIEWER: Proteo, 100-D-24	PAGE: 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron	UJ	J10D49, J10D50	Blank contamination
Sodium	UJ	J10D49	Blank contamination
Antimony Calcium	J	All	MS 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.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD									
Lab: LLJ		SDG: K0093							
Sample Number	J10D47		J10D48		J10D49		J10D50		
Remarks			Duplicate		E. Blank				
Sample Date	11/3/05		11/3/05		11/3/05		11/3/05		
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.15	U	0.15	U	0.14	U	0.16	U
Aluminum		4490		3990		29.1		3880	
Arsenic	10	2.3		2.1		0.33	U	2.3	
Boron		1.9		3.4		0.36	UJ	1.1	UJ
Barium	2	57.4		53.9		0.86		60.3	
Beryllium		0.27		0.24		0.01	U	0.23	
Calcium		6680	J	5970	J	18.9	J	6190	J
Cadmium	0.2	0.14		0.19		0.07	U	0.20	
Cobalt		7.6		6.7		0.12	U	7.3	
Chromium	1	6.2		4.6		0.16	U	5.0	
Copper		15.3		14.5		0.12	U	14.1	
Iron		20800		18600		65.0		19800	
Mercury	0.2	0.06		0.06		0.01	U	0.04	
Potassium		790		714		12.1		710	
Magnesium		4100		3560		4.9		3670	
Manganese		276		253		2.2		295	
Molybdenum		0.42		0.29		0.13	U	0.47	
Sodium		178		165		5.6	UJ	154	
Nickel		9.8		7.0		0.13	U	7.6	
Lead	5	4.1		3.5		0.30	U	3.6	
Antimony		0.44	UJ	0.43	UJ	0.39	UJ	0.45	UJ
Selenium	1	0.39	U	0.38	U	0.35	U	0.41	U
Silicon		484		545		28.7		523	
Vanadium		48.7		40.3		0.09	U	45.5	
Zinc	1	41.6		34.8		2.0		36.4	

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05111660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10D47	Silver, Total	0.15	u	MG/KG 0.15	1.0
		Aluminum, Total	4490		MG/KG 2.0	1.0
		Arsenic, Total	2.3		MG/KG 0.27	1.0
		Boron, Total	1.9		MG/KG 0.29	1.0
		Barium, Total	57.4		MG/KG 0.02	1.0
		Beryllium, Total	0.27		MG/KG 0.01	1.0
		Calcium, Total	6680	J	MG/KG 1.3	1.0
		Cadmium, Total	0.14		MG/KG 0.08	1.0
		Cobalt, Total	7.6		MG/KG 0.13	1.0
		Chromium, Total	6.2		MG/KG 0.17	1.0
		Copper, Total	15.3		MG/KG 0.13	1.0
		Iron, Total	20800		MG/KG 3.5	1.0
		Mercury, Total	0.06		MG/KG 0.02	1.0
		Potassium, Total	790		MG/KG 6.0	1.0
		Magnesium, Total	4100		MG/KG 1.5	1.0
		Manganese, Total	276		MG/KG 0.02	1.0
		Molybdenum, Total	0.42		MG/KG 0.14	1.0
		Sodium, Total	178		MG/KG 0.19	1.0
		Nickel, Total	9.8		MG/KG 0.14	1.0
		Lead, Total	4.1		MG/KG 0.34	1.0
		Antimony, Total	0.44	u	J MG/KG 0.44	1.0
		Selenium, Total	0.39	u	MG/KG 0.39	1.0
		Silicon, Total	484		MG/KG 0.89	1.0
		Vanadium, Total	48.7		MG/KG 0.1	1.0
		Zinc, Total	41.6		MG/KG 0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10D48	Silver, Total	0.15	u MG/KG	0.15	1.0
		Aluminum, Total	3990	MG/KG	2.0	1.0
		Arsenic, Total	2.1	MG/KG	0.36	1.0
		Boron, Total	1.4	MG/KG	0.29	1.0
		Barium, Total	53.9	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.01	1.0
		Calcium, Total	5970	MG/KG	1.3	1.0
		Cadmium, Total	0.19	MG/KG	0.07	1.0
		Cobalt, Total	6.7	MG/KG	0.13	1.0
		Chromium, Total	4.6	MG/KG	0.17	1.0
		Copper, Total	14.5	MG/KG	0.13	1.0
		Iron, Total	18600	MG/KG	3.4	1.0
		Mercury, Total	0.06	MG/KG	0.02	1.0
		Potassium, Total	714	MG/KG	5.9	1.0
		Magnesium, Total	3560	MG/KG	1.4	1.0
		Manganese, Total	253	MG/KG	0.02	1.0
		Molybdenum, Total	0.29	MG/KG	0.14	1.0
		Sodium, Total	165	MG/KG	0.18	1.0
		Nickel, Total	7.0	MG/KG	0.14	1.0
		Lead, Total	3.5	MG/KG	0.33	1.0
		Antimony, Total	0.43	u MG/KG	0.43	1.0
		Selenium, Total	0.38	u MG/KG	0.38	1.0
		Silicon, Total	545	MG/KG	0.87	1.0
		Vanadium, Total	40.3	MG/KG	0.1	1.0
		Zinc, Total	34.8	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/17/05

CLIENT: TRUMANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05111660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J10D45	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	29.1	MG/KG	1.8	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Boron, Total	0.36 <i>JS</i>	MG/KG	0.26	1.0
		Barium, Total	0.86	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	18.9	<i>J</i> MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	65.0	MG/KG	3.1	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	12.1	MG/KG	5.4	1.0
		Magnesium, Total	4.9	MG/KG	1.3	1.0
		Manganese, Total	2.2	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	5.6 <i>JS</i>	MG/KG	0.17	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.39 u	<i>J</i> MG/KG	0.39	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Silicon, Total	28.7	MG/KG	0.80	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	2.0	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J10D50	Silver, Total	0.16 u	MG/KG	0.16	1.0
		Aluminum, Total	3880	MG/KG	2.1	1.0
		Arsenic, Total	2.3	MG/KG	0.39	1.0
		Boron, Total	1.1 u	MG/KG	0.31	1.0
		Barium, Total	60.3	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.01	1.0
		Calcium, Total	6190 J	MG/KG	1.3	1.0
		Cadmium, Total	0.20	MG/KG	0.08	1.0
		Cobalt, Total	7.3	MG/KG	0.14	1.0
		Chromium, Total	5.0	MG/KG	0.18	1.0
		Copper, Total	14.1	MG/KG	0.14	1.0
		Iron, Total	19800	MG/KG	3.6	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Potassium, Total	710	MG/KG	6.3	1.0
		Magnesium, Total	3670	MG/KG	1.5	1.0
		Manganese, Total	295	MG/KG	0.02	1.0
		Molybdenum, Total	0.47	MG/KG	0.15	1.0
		Sodium, Total	154	MG/KG	0.19	1.0
		Nickel, Total	7.6	MG/KG	0.15	1.0
		Lead, Total	3.6	MG/KG	0.35	1.0
		Antimony, Total	0.45 u	MG/KG	0.45	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0
		Silicon, Total	523	MG/KG	0.93	1.0
		Vanadium, Total	45.5	MG/KG	0.10	1.0
		Zinc, Total	36.4	MG/KG	0.06	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD RC-029
LVL#: 0511L660
SDG/SAF#: K0093/RC-029

W.O.#: 11343-606-001-9999-00
Date Received: 11-08-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LVL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blank for 1 analyte was outside 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.
 - a). The MB result for Sodium was greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J10D49 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 7 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

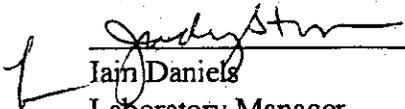
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of **21** pages.

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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:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
J10D47	Calcium	20,000	94.5
	Iron	20,000	109.8
	Magnesium	20,000	101.0
	Manganese	2,000	91.3
	Antimony	100	92.4
	Silicon	2,000	92.9
	Vanadium	1,000	96.1

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature:


 Jaim Daniels
 Laboratory Manager
 Lionville Laboratory Incorporated
 jjw/m11-660

11/21/08
 Date



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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-029-002

Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH	Price Code	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Soil	Sampling Location 100-D-24	SAF No. RC-029	Air Quality <input type="checkbox"/>		
Ice Chest No. AFS-04-006	Field Logbook No. EL-1578-7	COA C10DR16700	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060106	Bill of Lading/Air Bill No. See OSE			

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad
Cool 4°C
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Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	G/P	G
No. of Container(s)	1	1	1	1	1	1
Volume	1000mL	60mL	250mL	120mL	250mL	60mL
See item (1) in Special Instructions	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7196	Semi-VOA - #270A (TCL)	VOA - #260A (TCL)	

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time							
J10D47	SOIL	11/3/05	0745		X	X	X	X		
J10D48	SOIL	11/3/05	0745		X	X	X	X		
J10D49	SOIL	11/3/05	0730		X		X			
J10D50	SOIL	11/3/05	0755		X	X	X	X		

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By/Removed From <i>[Signature]</i> 11/3/05	Received By/Stored In <i>[Signature]</i> 11/3/05 1515
Relinquished By/Removed From <i>[Signature]</i> 11/7/05 1000	Received By/Stored In <i>[Signature]</i> 11/7/05 1000
Relinquished By/Removed From <i>[Signature]</i> 11/7/05 1000	Received By/Stored In <i>[Signature]</i> Fed Ex
Relinquished By/Removed From <i>[Signature]</i> 11/8/05 0940	Received By/Stored In <i>[Signature]</i> 11-8-05 0940
Relinquished By/Removed From	Received By/Stored In
Relinquished By/Removed From	Received By/Stored In

SPECIAL INSTRUCTIONS

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

Matrix *

- S=Soil
- SR=Bottom
- SO=Soil
- SL=Sludge
- W=Water
- O=Oil
- A=Air
- DS=Dross Sludge
- DL=Dross Liquor
- T=Time
- W/W=Water
- L=Liquid
- V=Vegetation
- X=Other

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

Appendix 5

Data Validation Supporting Documentation

000019

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-24		DATA PACKAGE: K0093		
VALIDATOR:	JLJ	LAB: LLT	DATE: 12/31/05		
			SDG: K0093		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10D47 J10D48 J10D49 J10D50					
50.1					

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: Boron - 49.50 - UT
Sodium - 49 - UT no FB

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 - 58.590 J al
Calcium - 59.12 J al no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

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?.....	<input checked="" type="radio"/> Yes	No	N/A
Sample holding times acceptable?.....	<input checked="" type="radio"/> Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

- Results reported for all requested analyses?..... Yes No N/A
- Results supported in the raw data? (Levels D, E)..... Yes No N/A
- Samples properly prepared? (Levels D, E)..... Yes No N/A
- Detection limits meet RDL?..... Yes No N/A
- Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000025

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/17/05

CLIENT: TNUHANFORD RC-029 K0093

LVL LOT #: 0511L660

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05LO654-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	1.8 u	MG/KG	1.8	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.29	MG/KG	0.27	1.0
		Barium, Total	0.05	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	2.2	MG/KG	1.2	1.0
		Cadmium, Total	0.07 u	MG/KG	0.07	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.16 u	MG/KG	0.16	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	3.2 u	MG/KG	3.2	1.0
		Potassium, Total	5.5 u	MG/KG	5.5	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.02	MG/KG	0.02	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	1.2	MG/KG	0.17	1.0
		Nickel, Total	0.13 u	MG/KG	0.13	1.0
		Lead, Total	0.31 u	MG/KG	0.31	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	0.82 u	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	05C0265-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Licnville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L660

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (BPK)
-001	J10D47	Silver, Total	5.0	0.15u	5.4	92.6	1.0
		Aluminum, Total	4700	4490	216	98.0*	1.0
		Arsenic, Total	189	2.3	216	86.6	1.0
		Boron, Total	95.0	1.9	108	86.3	1.0
		Barium, Total	260	57.4	216	94.0	1.0
		Beryllium, Total	5.1	0.27	5.4	89.4	1.0
		Calcium, Total	2170	6580	2700	59.1	1.0
		Cadmium, Total	4.9	0.14	5.4	88.2	1.0
		Cobalt, Total	54.5	7.6	54.0	86.9	1.0
		Chromium, Total	24.8	6.2	21.6	86.1	1.0
		Copper, Total	40.2	15.3	27.0	92.2	1.0
		Iron, Total	18200	20800	108	-2400. *	1.0
		Mercury, Total	0.24	0.06	0.17	104.8	1.0
		Potassium, Total	3170	790	2700	88.3	1.0
		Magnesium, Total	6050	4100	2700	72.3	1.0
		Manganese, Total	306	276	54.0	55.7*	1.0
		Molybdenum, Total	95.2	0.42	108	87.8	1.0
		Sodium, Total	2590	178	2700	69.5	1.0
		Nickel, Total	54.4	9.8	54.0	82.6	1.0
		Lead, Total	50.8	4.1	54.0	86.5	1.0
		Antimony, Total	31.6	0.44u	54.0	58.5	1.0
		Selenium, Total	184	0.39u	216	85.3	1.0
		Silicon, Total	834	484	108	124.7*	1.0
		Vanadium, Total	88.4	48.7	54.0	73.5	1.0
		Zinc, Total	83.4	41.6	54.0	77.4	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093

LVL LOT #: 0511L660

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	J10D47	Silver, Total	0.15u	0.15u	NC	1.0
		Aluminum, Total	4490	3880	14.6	1.0
		Arsenic, Total	2.3	2.1	9.1	1.0
		Boron, Total	1.9	0.96	65.3	1.0
		Barium, Total	57.4	60.0	4.4	1.0
		Beryllium, Total	0.27	0.23	14.7	1.0
		Calcium, Total	6580	5800	12.6	1.0
		Cadmium, Total	0.14	0.13	4.0	1.0
		Cobalt, Total	7.6	6.7	12.6	1.0
		Chromium, Total	6.2	5.9	5.0	1.0
		Copper, Total	15.3	14.7	4.0	1.0
		Iron, Total	20800	18200	13.2	1.0
		Mercury, Total	0.06	0.06	6.0	1.0
		Potassium, Total	790	721	9.2	1.0
		Magnesium, Total	4100	3590	13.2	1.0
		Manganese, Total	276	261	5.8	1.0
		Molybdenum, Total	0.42	0.40	3.5	1.0
		Sodium, Total	178	166	7.0	1.0
		Nickel, Total	9.8	8.5	14.2	1.0
		Lead, Total	4.1	3.7	10.3	1.0
		Antimony, Total	0.44u	0.44u	NC	1.0
		Selenium, Total	0.39u	0.39u	NC	1.0
		Silicon, Total	484	414	15.5	1.0
		Vanadium, Total	48.7	39.8	20.1	1.0
		Zinc, Total	41.6	34.6	18.4	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/17/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L660

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	0510654-LC1	Silver, LCS	48.4	50.0	MG/KG	96.8
		Aluminum, LCS	482	500	MG/KG	96.3
		Arsenic, LCS	923	1000	MG/KG	93.3
		Boron, LCS	471	500	MG/KG	94.1
		Barium, LCS	486	500	MG/KG	97.3
		Beryllium, LCS	24.4	25.0	MG/KG	97.6
		Calcium, LCS	2420	2500	MG/KG	96.9
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Cobalt, LCS	246	250	MG/KG	98.5
		Chromium, LCS	49.6	50.0	MG/KG	99.2
		Copper, LCS	123	125	MG/KG	98.7
		Iron, LCS	491	500	MG/KG	98.2
		Potassium, LCS	2270	2500	MG/KG	90.9
		Magnesium, LCS	2400	2500	MG/KG	96.3
		Manganese, LCS	74.6	75.0	MG/KG	99.5
		Molybdenum, LCS	494	500	MG/KG	98.7
		Sodium, LCS	2300	2500	MG/KG	91.8
		Nickel, LCS	193	200	MG/KG	96.5
		Lead, LCS	241	250	MG/KG	96.5
		Antimony, LCS	286	300	MG/KG	95.2
		Selenium, LCS	916	1000	MG/KG	91.6
		Silicon, LCS	409	500	MG/KG	81.7
		Vanadium, LCS	246	250	MG/KG	98.6
		Zinc, LCS	96.3	100	MG/KG	96.3
LCS1	05C0265-LC1	Mercury, LCS	6.4	2.9	MG/KG	102.9

MW
~~102.3~~
 102.9
 11/17/05

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Date: 5 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-24
Subject: Semivolatile - Data Package No. K0093

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0093-LLI 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
J10D47	11/3/05	Soil	C	See note 1
J10D48	11/3/05	Soil	C	See note 1
J10D49	11/3/05	Soil	C	See note 1
J10D50	11/3/05	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) 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

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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, the bis(2-ethylhexyl)phthalate result in all samples (except J10D48) were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

One equipment blank (J10D49) was submitted for analysis. No analytes were detected in the field 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

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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 recoveries outside QC limits, all bis(2-chloroethyl)ether (19%), 2-chlorophenol (34%), 1,3,-dichlorobenzene (11%), 1,4-dichlorobenzene (11%), 1,2-dichlorobenzene (16%), 2-methylphenol (55%), 2,2-oxybis(1-chloropropane) (26%), hexachloroethane (17%), nitrobenzene (24%), isopherone (43%), 2-nitrophenol (32%), 2,4-dimethylphenol (48%), bis(2-chloroethoxy)methane (33%), 1,2,4-trichlorobenzene (29%), naphthalene (30%), hexachlorbutadiene (28%), 2-methylnaphthalene (46%) and carbazole (57%) results were qualified as estimates and flagged "J".

Due to matrix spike duplicate recoveries outside QC limits, all isopherone (58%), naphthalene (55%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all 2-nitrophenol (48%), 2,4-dimethylphenol (48%), 2,4-dichlorophenol (45%), 1,2,4-trichlorobenzene (44%), 4-choro-3-methylphenol (54%), 2-methylnaphthalene (53%) and carbazole (49%) 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.

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· **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to an RPD outside QC limits, all phenol (49%), bis(2-chloroethyl)ether (116%), 2-chlorophenol (80%), 1,3-dichlorobenzene (147%), 1,4-dichlorobenzene (72%), 1,2-dichlorobenzene (128%), 2-methylphenol (38%), 2,2'-oxybis(1-chloropropane) (89%), n-nitroso-di-n-propylamine (40%), hexachloroethane (112%), nitrobenzene (72%), 2-nitrophenol (51%), bis(2-chloroethoxy)methane (48%), 1,2,4-trichlorobenzene (62%), naphthalene (52%), 4-chloroaniline (39%), hexachlorobutadiene (70%) and hexachlorocyclopentadiene (68%) results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J10D47/J10D48) 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 (RQL's) to ensure that laboratory detection levels meet the required criteria. Thirty-two analytes exceeded the RQL. Under the BHI statement of work, no qualification is required. All other analytes met the RQL.

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• **Completeness**

Data package No. K0093-LLI 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 bis(2-ethylhexyl)phthalate result in all samples (except J10D48) were qualified as undetected, raised to the RQL and flagged "U".
- Due to matrix spike recoveries outside QC limits, all bis(2-chloroethyl)ether (19%), 2-chlorophenol (34%), 1,3-dichlorobenzene (11%), 1,4-dichlorobenzene (11%), 1,2-dichlorobenzene (16%), 2-methylphenol (55%), 2,2'-oxybis(1-chloropropane) (26%), hexachloroethane (17%), nitrobenzene (24%), isophorone (43%), 2-nitrophenol (32%), 2,4-dimethylphenol (48%), bis(2-chloroethoxy)methane (33%), 1,2,4-trichlorobenzene (29%), naphthalene (30%), hexachlorbutadiene (28%), 2-methylnaphthalene (46%) and carbazole (57%) results were qualified as estimates and flagged "J".
- Due to matrix spike duplicate recoveries outside QC limits, all isophorone (58%), naphthalene (55%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".
- Due to LCS recoveries outside QC limits, all 2-nitrophenol (48%), 2,4-dimethylphenol (48%), 2,4-dichlorophenol (45%), 1,2,4-trichlorobenzene (44%), 4-chloro-3-methylphenol (54%), 2-methylnaphthalene (53%) and carbazole (49%) results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all phenol (49%), bis(2-chloroethyl)ether (116%), 2-chlorophenol (80%), 1,3-dichlorobenzene (147%), 1,4-dichlorobenzene (72%), 1,2-dichlorobenzene (128%), 2-methylphenol (38%), 2,2'-oxybis(1-chloropropane) (89%), n-nitroso-di-n-propylamine (40%), hexachloroethane (112%), nitrobenzene (72%), 2-nitrophenol (51%), bis(2-chloroethoxy)methane (48%), 1,2,4-trichlorobenzene (62%), naphthalene

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(52%), 4-chloroaniline (39%), hexachlorobutadiene (70%) and hexachlorocyclopentadiene (68%) 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.

Thirty-two analytes exceeded the RQL. Under the BHI 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).

000008

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG# 0095		REVIEWER	Project # 100-D-24	PAGE 11 OF 11
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Bis(2-ethylhexyl)phthalate	U at RQL	All except J10D48	Blank contamination	
bis(2-chloroethyl)ether 2-chlorophenol 1,3,-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene 2-methylphenol 2,2-oxybis(1-chloropropane) hexachloroethane nitrobenzene Isophorone 2-nitrophenol 2,4-dimethylphenol bis(2-chloroethoxy)methane 1,2,4-trichlorobenzene naphthalene hexachlorbutadiene 2-methylnaphthalene carbazole	J	All	MS recovery	
Isophorone naphthalene 2-methylnaphthalene	J	All	MSD recovery	
2-nitrophenol 2,4-dimethylphenol 2,4-dichlorophenol 1,2,4-trichlorobenzene 4-choro-3-methylphenol 2-methylnaphthalene carbazole	J	All	LCS recovery	
phenol bis(2-chloroethyl)ether 2-chlorophenol 1,3,-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene 2-methylphenol 2,2-oxybis(1-chloropropane)	J	All	RPD	

000010

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

n-nitroso-di-n-propylamine hexachloroethane nitrobenzene 2-nitrophenol bis(2-chloroethoxy)methane 1,2,4-trichlorobenzene naphthalene 4-chloroaniline hexachlorbutadiene hexachlorocyclopentadiene carbazole			
---	--	--	--

* - 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: LLI		SDG: K0093							
Sample Number	J10D47		J10D48		J10D49		J10D50		
Remarks			Duplicate		E. Blank				
Sample Date	11/3/05		11/3/05		11/3/05		11/3/05		
Extraction Date	11/9/05		11/9/05		11/9/05		11/9/05		
Analysis Date	11/15/05		11/15/05		11/15/05		11/15/05		
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	370	UJ	730	UJ	330	UJ	390	UJ
bis(2-Chloroethyl)ether	660	370	UJ	730	UJ	330	UJ	390	UJ
2-Chlorophenol	660	370	UJ	730	UJ	330	UJ	390	UJ
1,3-Dichlorobenzene	660	370	UJ	730	UJ	330	UJ	390	UJ
1,4-Dichlorobenzene	660	370	UJ	730	UJ	330	UJ	390	UJ
1,2-Dichlorobenzene	660	370	UJ	730	UJ	330	UJ	390	UJ
2-Methylphenol	660	370	UJ	730	UJ	330	UJ	390	UJ
2,2'-oxybis(1-chloropropane)	660	370	UJ	730	UJ	330	UJ	390	UJ
4-Methylphenol	660	370	U	730	U	330	U	390	U
N-Nitroso-di-n-propylamine	660	370	UJ	730	UJ	330	UJ	390	UJ
Hexachloroethane	660	370	UJ	730	UJ	330	UJ	390	UJ
Nitrobenzene	660	370	UJ	730	UJ	330	UJ	390	UJ
Isophorone	660	370	UJ	730	UJ	330	UJ	390	UJ
2-Nitrophenol	660	370	UJ	730	UJ	330	UJ	390	UJ
2,4-Dimethylphenol	660	370	UJ	730	UJ	330	UJ	390	UJ
bis(2-Chloroethoxy)methane	660	370	UJ	730	UJ	330	UJ	390	UJ
2,4-Dichlorophenol	660	370	U	730	U	330	U	390	U
1,2,4-Trichlorobenzene	660	370	UJ	730	UJ	330	UJ	390	UJ
Naphthalene	660	370	UJ	730	UJ	330	UJ	390	UJ
4-Chloroaniline	660	370	UJ	730	UJ	330	UJ	390	UJ
Hexachlorobutadiene	660	370	UJ	730	UJ	330	UJ	390	UJ
4-Chloro-3-methylphenol	660	370	U	730	U	330	U	390	U
2-Methylnaphthalene	660	370	UJ	730	UJ	330	UJ	390	UJ
Hexachlorocyclopentadiene	660	370	UJ	730	UJ	330	UJ	390	UJ
2,4,6-Trichlorophenol	660	370	U	730	U	330	U	390	U
2,4,5-Trichlorophenol*	660	930	U	1800	U	830	U	970	U
2-Chloronaphthalene	660	370	U	730	U	330	U	390	U
2-Nitroaniline*	660	930	U	1800	U	830	U	970	U
Dimethylphthalate	660	370	U	730	U	330	U	390	U
Acenaphthylene	660	370	U	730	U	330	U	390	U
2,6-Dinitrotoluene	660	370	U	730	U	330	U	390	U

000013

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

Project: WASHINGTON CLOSURE HANFORD									
Laboratory: LLJ		SDG: K0093							
Sample Number	J10D47		J10D48		J10D49		J10D50		
Remarks			Duplicate		E. Blank				
Sample Date	11/3/05		11/3/05		11/3/05		11/3/05		
Extraction Date	11/9/05		11/9/05		11/9/05		11/9/05		
Analysis Date	11/15/05		11/15/05		11/15/05		11/15/05		
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	930	UJ	1800	UJ	830	UJ	970	UJ
Acenaphthene	660	370	U	730	U	330	U	390	U
2,4-Dinitrophenol*	660	930	U	1800	U	830	U	970	U
4-Nitrophenol*	660	930	U	1800	U	830	U	970	U
Dibenzofuran	660	370	U	730	U	330	U	390	U
2,4-Dinitrotoluene	660	370	U	730	U	330	U	390	U
Diethylphthalate	660	370	U	730	U	330	U	390	U
4-Chlorophenyl-phenyl ether	660	370	U	730	U	330	U	390	U
Fluorene	660	370	U	730	U	330	U	390	U
4-Nitroaniline*	660	930	U	1800	U	830	U	970	U
4,6-Dinitro-2-methylphenol*	660	930	U	1800	U	830	U	970	U
N-Nitrosodiphenylamine	660	370	U	730	U	330	U	390	U
4-Bromophenyl-phenyl ether	660	370	U	730	U	330	U	390	U
Hexachlorobenzene	660	370	U	730	U	330	U	390	U
Pentachlorophenol*	660	930	U	1800	U	830	U	970	U
Phenanthrene	660	370	U	730	U	330	U	390	U
Anthracene	660	370	U	730	U	330	U	390	U
Carbazole	660	370	UJ	730	UJ	330	UJ	390	UJ
Di-n-butylphthalate	660	370	U	730	U	330	U	22	
Fluoranthene	660	370	U	730	U	330	U	390	U
Pyrene	660	370	U	730	U	330	U	390	U
Butylbenzylphthalate	660	370	U	730	U	330	U	390	U
3,3'-Dichlorobenzidine	660	370	U	730	U	330	U	390	U
Benzo(a)anthracene	660	370	U	730	U	330	U	390	U
Chrysene	660	370	U	730	U	330	U	390	U
bis(2-Ethylhexyl)phthalate	660	660	U	730	U	660	U	660	U
Di-n-octylphthalate	660	370	U	730	U	330	U	390	U
Benzo(b)fluoranthene	660	370	U	730	U	330	U	390	U
Benzo(k)fluoranthene	660	370	U	730	U	330	U	390	U
Benzo(a)pyrene	660	370	U	730	U	330	U	390	U
Indeno(1,2,3-cd)pyrene	660	370	U	730	U	330	U	390	U
Dibenz(a,h)anthracene	660	370	U	730	U	330	U	390	U
Benzo(g,h,i)perylene	660	370	U	730	U	330	U	390	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

Lionville Laboratory, Inc.
Semivolatiles by GC/MS, HSL List

Report Date: 11/17/05 15:46

RFW Batch Number: 0511L660

Client: TNUHANFORD RC-029 K0093

Work Order: 11343606001

Page: 1a

Cust ID:	J10D47	J10D47	J10D47	J10D48	J10D49	J10D50	
Sample Information	RPW#: 001	001 MS	001 MSD	002	003	004	
	Matrix: SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	D.F.: 1.00	1.00	1.00	2.00	1.00	1.00	
	Units: ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Surrogate	Nitrobenzene-d5	60 %	24 %	47 %	73 %	67 %	58 %
Recovery	2-Fluorobiphenyl	61 %	59 %	75 %	73 %	63 %	59 %
	Terphenyl-d14	115 %	111 %	136 %	78 %	73 %	107 %
	Phenol-d5	71 %	49 %	75 %	82 %	67 %	69 %
	2-Fluorophenol	64 %	22 * %	68 %	71 %	66 %	63 %
	2,4,6-Tribromophenol	70 %	84 %	98 %	75 %	68 %	69 %
-----fl-----fl-----fl-----fl-----fl-----fl							
Phenol	370 U J	50 %	83 %	730 U J	330 U J	390 U J	
bis(2-Chloroethyl) ether	370 U	19 * %	72 %	730 U	330 U	390 U	
2-Chlorophenol	370 U	34 * %	79 %	730 U	330 U	390 U	
1,3-Dichlorobenzene	370 U	11 * %	72 %	730 U	330 U	390 U	
1,4-Dichlorobenzene	370 U	11 * %	69 %	730 U	330 U	390 U	
1,2-Dichlorobenzene	370 U	16 * %	73 %	730 U	330 U	390 U	
2-Methylphenol	370 U	55 * %	81 %	730 U	330 U	390 U	
2,2'-oxybis(1-Chloropropane)	370 U	26 * %	68 %	730 U	330 U	390 U	
4-Methylphenol	370 U	64 %	82 %	730 U	330 U	390 U	
N-Nitroso-di-n-propylamine	370 U J J	51 %	77 %	730 U J J	330 U J J	390 U J J	
Hexachloroethane	370 U J J	17 * %	61 %	730 U J J	330 U J J	390 U J J	
Nitrobenzene	370 U	24 * %	51 %	730 U	330 U	390 U	
Isophorone	370 U	43 * %	58 * %	730 U	330 U	390 U	
2-Nitrophenol	370 U	32 * %	54 %	730 U	330 U	390 U	
2,4-Dimethylphenol	370 U	48 * %	52 %	730 U	330 U	390 U	
bis(2-Chloroethoxy)methane	370 U	33 * %	54 %	730 U	330 U	390 U	
2,4-Dichlorophenol	370 U	52 %	64 %	730 U	330 U	390 U	
1,2,4-Trichlorobenzene	370 U J	29 * %	55 * %	730 U J	330 U J	390 U J	
Naphthalene	370 U J	30 * %	51 %	730 U J	330 U J	390 U J	
4-Chloroaniline	370 U J	47 %	70 %	730 U J	330 U J	390 U J	
Hexachlorobutadiene	370 U J	28 * %	58 %	730 U J	330 U J	390 U J	
4-Chloro-3-methylphenol	370 U J	60 %	64 %	730 U	330 U	390 U	
2-Methylnaphthalene	370 U J	46 * %	58 * %	730 U J	330 U J	390 U J	
Hexachlorocyclopentadiene	370 U J	30 %	61 %	730 U J	330 U J	390 U J	
2,4,6-Trichlorophenol	370 U	77 %	92 %	730 U	330 U	390 U	
2,4,5-Trichlorophenol	930 U	83 %	97 %	1800 U	830 U	970 U	

*= Outside of EPA CLP QC limits.

1/4/06

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00000007

	Cust ID:	J10D47	J10D47	J10D47	J10D48	J10D49	J10D50
RFW#:	001	001 MS	001 MSD	002	003	004	
2-Chloronaphthalene	370 U	64 %	81 %	730 U	330 U	390 U	
2-Nitroaniline	930 U	71 %	82 %	1800 U	830 U	970 U	
Dimethylphthalate	370 U	81 %	93 %	730 U	330 U	390 U	
Acenaphthylene	370 U	71 %	86 %	730 U	330 U	390 U	
2,6-Dinitrotoluene	370 U	81 %	95 %	730 U	330 U	390 U	
3-Nitroaniline	930 U J	90 %	117 %	1800 U J	830 U J	970 U J	
Acenaphthene	370 U	72 %	84 %	730 U	330 U	390 U	
2,4-Dinitrophenol	930 U	65 %	50 %	1800 U	830 U	970 U	
4-Nitrophenol	930 U	82 %	84 %	1800 U	830 U	970 U	
Dibenzofuran	370 U	79 %	92 %	730 U	330 U	390 U	
2,4-Dinitrotoluene	370 U	90 %	101 %	730 U	330 U	390 U	
Diethylphthalate	370 U	63 %	69 %	730 U	330 U	390 U	
4-Chlorophenyl-phenylether	370 U	77 %	90 %	730 U	330 U	390 U	
Fluorene	370 U	77 %	87 %	730 U	330 U	390 U	
4-Nitroaniline	930 U	64 %	67 %	1800 U	830 U	970 U	
4,6-Dinitro-2-methylphenol	930 U	85 %	83 %	1800 U	830 U	970 U	
N-Nitrosodiphenylamine (1)	370 U	60 %	74 %	730 U	330 U	390 U	
4-Bromophenyl-phenylether	370 U	75 %	93 %	730 U	330 U	390 U	
Hexachlorobenzene	370 U	89 %	106 %	730 U	330 U	390 U	
Pentachlorophenol	930 U	92 %	97 %	1800 U	830 U	970 U	
Phenanthrene	370 U	83 %	98 %	730 U	330 U	390 U	
Anthracene	370 U	81 %	92 %	730 U	330 U	390 U	
Carbazole	370 U J	57 %	62 %	730 U J	330 U J	390 U J	
Di-n-butylphthalate	370 U	74 %	79 %	730 U	330 U	22 J	
Fluoranthene	370 U	72 %	75 %	730 U	330 U	390 U	
Pyrene	370 U	111 %	134 %	730 U	330 U	390 U	
Butylbenzylphthalate	370 U	106 %	117 %	730 U	330 U	390 U	
3,3'-Dichlorobenzidine	370 U	64 %	78 %	730 U	330 U	390 U	
Benzo(a)anthracene	370 U	83 %	101 %	730 U	330 U	390 U	
Chrysene	370 U	80 %	93 %	730 U	330 U	390 U	
bis(2-Ethylhexyl)phthalate	370 U <i>660 27/10/04 JB U</i>	113 %	131 %	730 U	330 U <i>660 33/10/04 JB U</i>	390 U <i>660 50/10/04 JB U</i>	
Di-n-octyl phthalate	370 U	102 %	114 %	730 U	330 U	390 U	
Benzo(b)fluoranthene	370 U	81 %	92 %	730 U	330 U	390 U	
Benzo(k)fluoranthene	370 U	74 %	88 %	730 U	330 U	390 U	
Benzo(a)pyrene	370 U	80 %	92 %	730 U	330 U	390 U	
Indeno(1,2,3-cd)pyrene	370 U	120 %	137 %	730 U	330 U	390 U	
Dibenz(a,h)anthracene	370 U	122 %	142 %	730 U	330 U	390 U	
Benzo(g,h,i)perylene	370 U	117 %	127 %	730 U	330 U	390 U	

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

000016

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Y 1/4/06

RFW Batch Number: 0511L660

Client: TNUHANFORD RC-029 K0093

Work Order: 11343606001

Page: 2a

Cust ID: SBLKQE

SBLKQE BS

Sample	RFW#:	05LE0880-MB1	05LE0880-MB1
Information	Matrix:	SOIL	SOIL
	D.P.:	1.00	1.00
	Units:	ug/Kg	ug/Kg

Surrogate	Nitrobenzene-d5	68	%	47	%
Recovery	2-Fluorobiphenyl	53	%	75	%
	Terphenyl-d14	98	%	82	%
	Phenol-d5	70	%	76	%
	2-Fluorophenol	67	%	67	%
	2,4,6-Tribromophenol	42	%	73	%

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Phenol	330 U 81 %
bis(2-Chloroethyl) ether	330 U 78 %
2-Chlorophenol	330 U 84 %
1,3-Dichlorobenzene	330 U 77 %
1,4-Dichlorobenzene	330 U 71 %
1,2-Dichlorobenzene	330 U 75 %
2-Methylphenol	330 U 81 %
2,2'-oxybis(1-Chloropropane)	330 U 77 %
4-Methylphenol	330 U 79 %
N-Nitroso-di-n-propylamine	330 U 86 %
Hexachloroethane	330 U 70 %
Nitrobenzene	330 U 50 %
Isophorone	330 U 61 %
2-Nitrophenol	330 U 48 * %
2,4-Dimethylphenol	330 U 48 * %
bis(2-Chloroethoxy) methane	330 U 52 %
2,4-Dichlorophenol	330 U 45 * %
1,2,4-Trichlorobenzene	330 U 44 * %
Naphthalene	330 U 52 %
4-Chloroaniline	330 U 71 %
Hexachlorobutadiene	330 U 55 %
4-Chloro-3-methylphenol	330 U 54 * %
2-Methylnaphthalene	330 U 53 * %
Hexachlorocyclopentadiene	330 U 92 %
2,4,6-Trichlorophenol	330 U 84 %
2,4,5-Trichlorophenol	830 U 90 %

*= Outside of EPA CLP QC limits.

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11/17/05

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RFW#: 05LE0880-MB1 05LE0880-MB1

2-Chloronaphthalene	330	U	83	%
2-Nitroaniline	830	U	92	%
Dimethylphthalate	330	U	84	%
Acenaphthylene	330	U	79	%
2,6-Dinitrotoluene	330	U	84	%
3-Nitroaniline	830	U	121	%
Acenaphthene	330	U	82	%
2,4-Dinitrophenol	830	U	57	%
4-Nitrophenol	830	U	93	%
Dibenzofuran	330	U	82	%
2,4-Dinitrotoluene	330	U	90	%
Diethylphthalate	330	U	85	%
4-Chlorophenyl-phenylether	330	U	81	%
Fluorene	330	U	91	%
4-Nitroaniline	830	U	66	%
4,6-Dinitro-2-methylphenol	830	U	80	%
N-Nitrosodiphenylamine (1)	330	U	59	%
4-Bromophenyl-phenylether	330	U	69	%
Hexachlorobenzene	330	U	84	%
Pentachlorophenol	830	U	95	%
Phenanthrene	330	U	84	%
Anthracene	330	U	90	%
Carbazole	330	U	49	%
Di-n-butylphthalate	330	U	83	%
Fluoranthene	330	U	82	%
Pyrene	330	U	87	%
Butylbenzylphthalate	330	U	98	%
3,3'-Dichlorobenzidine	330	U	85	%
Benzo (a) anthracene	330	U	86	%
Chrysene	330	U	85	%
bis(2-Ethylhexyl)phthalate	18	J	92	%
Di-n-octyl phthalate	330	U	104	%
Benzo (b) fluoranthene	330	U	84	%
Benzo (k) fluoranthene	330	U	94	%
Benzo (a) pyrene	330	U	86	%
Indeno (1,2,3-cd) pyrene	330	U	83	%
Dibenz (a,h) anthracene	330	U	80	%
Benzo (g,h,i) perylene	330	U	81	%

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

000018

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Appendix 4
Laboratory Narrative and Chain-of-Custody Documentation

000019



Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0511L660
SDG/SAF # K0093/RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-08-2005

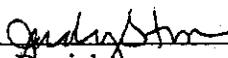
SEMIVOLATILE

Four (4) soil samples were collected on 11-03-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 11-09-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 11-11,15,16-2005.

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. Sample J10D48 required a 2-fold dilution due to high levels of target compounds.
5. One (1) of forty-eight (48) surrogate recoveries was outside acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
6. Twenty-two (22) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. Seven (7) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
8. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
9. Internal standard area and retention time criteria were not met for the blank and matrix spike samples. The blank spike sample was reanalyzed on 11-14-2005 with similar results. The initial sample analysis fulfills the reanalysis requirement of samples J10D47 MS and MSD.
10. 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").
11. 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.
12. 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.


Jain Daniels
Laboratory Manager

11/21/05
Date

Lionville Laboratory Incorporated

000020

som\group\data\bna\tnu-hanford\0511-660.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 18 pages.

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 05MS359

Initiator: Sharon Saylor
 Date: 11-18-05
 Client: TVA

Batch: 05104660
 Samples: 001ms, 001msd, 65
 Method: SW846MCA/WWGLP

Parameter: FL70
 Matrix: SOLID
 Prep Batch: 05LE0880

1. Reason for SDR

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

b. General Discrepancy

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

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

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

Several low analyte recoveries in the matrix spike, matrix spike dup and blank spike

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

[Signature]

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

[Signature]

5. Final Action...signature/date:

Other Explanation:

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

[Signature]

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

Route Distribution of Completed SDR
 Initiator
 Lab General Manager: M. Taylor
 Project Mgr. Stone/Johnson
 Data Management: Stowell
 Sample Prep: Beegle/Kiger

Route Distribution of Completed SDR
 Metals: Beegle
 Inorganic: Perrone
 GC/LC: Kiger
 MS: Rychlak/Daley
 Log-In: Perry
 Admin: _____
 Other: _____

0511600

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-029-002	Page 1 of 1
Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH		Price Code	Data Turnaround 15 Days	
Project Designation Remaining Sites Confirmation Sampling - Soil	Sampling Location 100-D-24	SAF No. RC-029	Air Quality <input type="checkbox"/>				
Ice Chest No. AFS-04-006	Field Logbook No. EL-1578-7	COA CI0DR16700	Method of Shipment Fed Ex				
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060106	Bill of Lading/Air Bill No. See OSF					

POSSIBLE SAMPLE HAZARDS/REMARKS <i>Non Rad</i> Special Handling and/or Storage <i>Cool 4°C</i> <i>000022</i>	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C			
	Type of Container	G	G/P	G/P	G/P	aG	G			
	No. of Container(s)	1	1	1	1	1	1			
	Volume	1000ml	60ml	250ml	120ml	250ml	60ml			

SAMPLE ANALYSIS				See item (1) in Special Instructions	See item (1) in Special Instructions - 14; Trace - M3	See item (2) in Special Instructions	Chromium Hex - 7196	Semi-VQA - 8270A (TCL)	VQA - 8260A (TCL)				
Sample No.	Matrix *	Sample Date	Sample Time										
J10D47	SOIL	11/3/05	0745			X	X	X	X				
J10D48	SOIL	11/3/05	0745			X	X	X	X				
J10D49	SOIL	11/3/05	0730			X		X					
J10D50	SOIL	11/3/05	0755			X	X	X	X				

CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix * S-Sol SE-Sediment SD-Solid SL-Sludge W - Water O-Oil A-Air DG-Drum/Drum DL-Drum/Liquid T-Tissue W1-Wipe L-Liquid V-Vegetation X-Other
Relinquished By/Removed From <i>M. Stankovich</i>	Date/Time 11/3/05 1515	Received By/Stored In <i>3728/ZC</i>	Date/Time 11/3/05 1515	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV).				
Relinquished By/Removed From <i>3728 R.C.ZC</i>	Date/Time 11/7/05 1000	Received By/Stored In <i>D. Stankovich</i>	Date/Time 11/7/05 1000					
Relinquished By/Removed From <i>John West</i>	Date/Time 11/2/05 1000	Received By/Stored In <i>Fed Ex</i>	Date/Time					
Relinquished By/Removed From <i>FOE</i>	Date/Time 11/8/05 0940	Received By/Stored In <i>Stankovich</i>	Date/Time 11-9-05 0940					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time					

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	700-D-24		DATA PACKAGE: K0093		
VALIDATOR:	TLI	LAB:	LLI	DATE: 12/31/05	
			SDG: K0093		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10D47 J10D48 J10D49 J10D50					
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: bis(2-ethylhexyl)phthalate - 0 at R06 all but 48

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: MS - 18 over } No PA
MSD - 3 over } I all
LCS - 7 over

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: RPD - 19 use - I all

6. SYSTEM PERFORMANCE (Levels D and E)

- Internal standards analyzed? Yes No N/A
- Internal standard areas acceptable? Yes No N/A
- Internal standard retention times acceptable? Yes No N/A
- Standards traceable? Yes No N/A
- Standards expired? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

- Samples properly preserved? Yes No N/A
- Sample holding times acceptable? Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E)..... Yes No **N/A**
 Compound quantitation acceptable? (Levels D, E)..... Yes No **N/A**
 Results reported for all requested analyses?..... **Yes** No **N/A**
 Results supported in the raw data? (Levels D, E)..... Yes No **N/A**
 Samples properly prepared? (Levels D, E)..... Yes No **N/A**
 Laboratory properly identified and coded all TIC? (Levels D, E)..... Yes No **N/A**
 Detection limits meet RDL?..... Yes **No** **N/A**
 Transcription/calculation errors? (Levels D, E)..... Yes No **N/A**
 Comments: 32 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? Yes No **N/A**
 GPC check performed? Yes No **N/A**
 GPC check recoveries acceptable?..... Yes No **N/A**
 GPC calibration performed?..... Yes No **N/A**
 GPC calibration check performed? Yes No **N/A**
 GPC calibration check retention times acceptable? Yes No **N/A**
 Check/calibration materials traceable?..... Yes No **N/A**
 Check/calibration materials Expired?..... Yes No **N/A**
 Analytical batch QC given similar cleanup? Yes No **N/A**
 Transcription/Calculation Errors?..... Yes No **N/A**
 Comments: _____

Date: 5 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-24
Subject: Radiochemistry - Data Package No. K0093-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0093-EB 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
J10D47	11/3/05	Soil	C	See note 1
J10D48	11/3/05	Soil	C	See note 1
J10D50	11/3/05	Soil	C	See note 1

1 – Carbon-14, nickel-63, gross alpha/beta, total strontium, alpha spectroscopy and gamma spectroscopy.

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

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

DATA QUALITY PARAMETERS

• Holding Times

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

All holding times were acceptable.

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- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

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

All other accuracy results were acceptable.

- **Laboratory Duplicates**

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

000002

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicate samples (J10D47/J10D48) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for potassium-40 (65%), radium-226 (47%), radium 228 (62%), thorium-228 (69%) and thorium-232 (47%) were outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

• **Detection Levels**

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

• **Completeness**

Data package No. K0093 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 the lack of a matrix spike analysis, all carbon-14 and tritium 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

000003

data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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.

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Appendix 1

Glossary of Data Reporting Qualifiers

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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.

000006

Appendix 2
Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0093		REVIEWER: [REDACTED]	Project: 00-B-24	PAGE: 1 OF 1
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Carbon-14 Tritium	J	All	No matrix spike analysis	

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD							
Laboratory: EB		SDG: K0093					
Sample Number	J10D47		J10D48		J10D50		
Remarks	Duplicate						
Sample Date	11/3/05		11/3/05		11/3/05		
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q
Gross Alpha		9.69		9.14		7.81	
Gross Beta		18.2		21.9		20.1	
Tritium	10	0.208	UJ	-0.044	UJ	0.515	UJ
Carbon-14	1	0.134	UJ	-0.432	UJ	-0.619	UJ
Uranium-233/234	1	0.567		0.406		0.563	
Uranium-235	1	0	U	0.038	U	0	U
Uranium-238	1	0.537		0.657		0.469	
Potassium-40		21.8		11.1		6.89	
Cobalt 60	0.05	U	U	U	U	U	U
Cesium 137	0.05	U	U	U	U	U	U
Radium-226		0.780		0.481		0.288	
Radium-228		1.35		0.707		0.481	
Europium 152	0.1	U	U*	U	U*	U	U
Europium 154	0.1	U	U*	U	U	U	U
Europium 155	0.1	U	U*	U	U*	U	U
Thorium-228		1.12		0.544		0.565	
Thorium-232		1.35		0.707		0.481	
Uranium-235(gea)		U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U

000010

* - RQL exceeded

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

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0093

R511098-01

J10D47

DATA SHEET

SDG <u>7769</u>	Client/Case no <u>Hanford</u>	SDG <u>K0093</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511098-01</u>	Client sample id <u>J10D47</u>	
Dept sample id <u>7769-001</u>	Location/Matrix <u>100-D-24</u>	<u>SOLID</u>
Received <u>11/08/05</u>	Collected/Weight <u>11/03/05 07:45</u>	<u>1634 g</u>
% solids <u>92.4</u>	Custody/SAF No <u>RC-029-002</u>	<u>RC-029</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	9.69	4.0	3.7	10		93A
Gross Beta	12587-47-2	18.2	4.5	5.9	15		93B
Tritium	10028-17-8	0.208	1.4	2.4	400	UJ	H
Carbon 14	14762-75-5	0.134	2.2	3.7	50	UJ	C
Uranium 233/234	U-233/234	0.567	0.24	0.23	1.0		U
Uranium 235	15117-96-1	0	0.072	0.28	1.0	U	U
Uranium 238	U-238	0.537	0.24	0.23	1.0		U
Potassium 40	13966-00-2	21.8	1.4	0.35			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	U		0.040	0.10	U	GAM
Radium 226	13982-63-3	0.780	0.079	0.067	0.10		GAM
Radium 228	15262-20-1	1.35	0.19	0.17	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Thorium 228	14274-82-9	1.12	0.063	0.060			GAM
Thorium 232	TH-232	1.35	0.19	0.17			GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		4.9		U	GAM
Americium 241	14596-10-2	U		0.40		U	GAM

Remaining Sites Confirm.Samp. - Soil

Handwritten: ✓ 1/4/06

000011

Lab id	<u>EBRLNE</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>3.06</u>
Report date	<u>12/01/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0093

R511098-02

J10D48

DATA SHEET

SDG <u>7769</u>	Client/Case no <u>Hanford</u>	SDG <u>K0093</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511098-02</u>	Client sample id <u>J10D48</u>	
Dept sample id <u>7769-002</u>	Location/Matrix <u>100-D-24</u>	<u>SOLID</u>
Received <u>11/08/05</u>	Collected/Weight <u>11/03/05 07:45</u>	<u>1671 g</u>
% solids <u>93.1</u>	Custody/SAF No <u>RC-029-002</u>	<u>RC-029</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	9.14	3.9	3.6	10		93A
Gross Beta	12587-47-2	21.9	4.9	6.4	15		93B
Tritium	10028-17-8	-0.044	1.4	2.3	400	U J	H
Carbon 14	14762-75-5	-0.432	2.0	3.4	50	U J	C
Uranium 233/234	U-233/234	0.406	0.25	0.24	1.0		U
Uranium 235	15117-96-1	0.038	0.076	0.29	1.0	U	U
Uranium 238	U-238	0.657	0.32	0.24	1.0		U
Potassium 40	13966-00-2	11.1	0.90	0.45			GAM
Cobalt 60	10198-40-0	U		0.041	0.050	U	GAM
Cesium 137	10045-97-3	U		0.038	0.10	U	GAM
Radium 226	13982-63-3	0.481	0.082	0.075	0.10		GAM
Radium 228	15262-20-1	0.707	0.22	0.22	0.20		GAM
Europium 152	14683-23-9	U		0.091	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Thorium 228	14274-82-9	0.544	0.047	0.048			GAM
Thorium 232	TH-232	0.707	0.22	0.22			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		4.4		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM

Remaining Sites Confirm.Samp. - Soil

R
11/4/06

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 12

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>12/01/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0093

R511098-03

J10D50

DATA SHEET

SDG <u>7769</u>	Client/Case no <u>Hanford</u>	SDG <u>K0093</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R511098-03</u>	Client sample id <u>J10D50</u>	
Dept sample id <u>7769-003</u>	Location/Matrix <u>100-D-24</u>	<u>SOLID</u>
Received <u>11/08/05</u>	Collected/Weight <u>11/03/05 07:55</u>	<u>1932 g</u>
% solids <u>90.9</u>	Custody/SAF No <u>RC-029-002</u>	<u>RC-029</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	7.81	3.6	3.3	10		93A
Gross Beta	12587-47-2	20.1	4.3	5.4	15		93B
Tritium	10028-17-8	0.515	1.3	2.2	400	U J	H
Carbon 14	14762-75-5	-0.619	1.9	3.3	50	U J	C
Uranium 233/234	U-233/234	0.563	0.25	0.24	1.0		U
Uranium 235	15117-96-1	0	0.076	0.29	1.0	U	U
Uranium 238	U-238	0.469	0.25	0.24	1.0		U
Potassium 40	13966-00-2	6.89	0.44	0.24			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	0.288	0.064	0.054	0.10		GAM
Radium 228	15262-20-1	0.481	0.12	0.10	0.20		GAM
Europium 152	14683-23-9	U		0.092	0.10	U	GAM
Europium 154	15585-10-1	U		0.094	0.10	U	GAM
Europium 155	14391-16-3	U		0.099	0.10	U	GAM
Thorium 228	14274-82-9	0.565	0.066	0.055			GAM
Thorium 232	TH-232	0.481	0.12	0.10			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		3.3		U	GAM
Americium 241	14596-10-2	U		0.14		U	GAM

Remaining Sites Confirm. Samp. - Soil

Handwritten signature
11/4/05

000013

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>12/01/05</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0093 was composed of three solid (soil) samples designated under SAF No. RC-029 with a Project Designation of: Remaining Sites Confirmation Sampling – Soil. The Sampling Location was 100-D-24.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on December 1, 2005.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Tritium Analysis

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.4 Isotopic Uranium Analysis

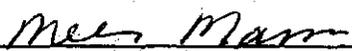
No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

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 C. Mannion
Senior Program Manager

12/02/05

Date

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-029-002	Page 1 of 1
Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH		Price Code	Data Turnaround	
Project Designation Remaining Sites Confirmation Sampling - Soil		Sampling Location 100-D-24	K0093 (7769)		SAF No. RC-029	Air Quality <input type="checkbox"/>	15 Days
Ice Chest No. AFS-04-004	Field Logbook No. EL-1578-7	COA C10DR16700	Method of Shipment Fed Ex		Bill of Lading/Air Bill No. See O&PC		
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A060087					

POSSIBLE SAMPLE HAZARDS/REMARKS
Non Rad

Special Handling and/or Storage
~~Don't St~~ DAS 11/7/05
NONE

Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	aG	G
No. of Container(s)	1	1	1	1	1	1
Volume	1000mL	60mL	250mL	120mL	250mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions	Carbon-14; Tritium - H3	See item (2) in Special Instructions	Chromium Hex - 7196	See item (3) in Special Instructions	VOA - 8260A (TCL)

000016

Sample No.	Matrix *	Sample Date	Sample Time						
J10D47	SOIL	11/3/05	11/3/05 0745	X	X				
J10D48	SOIL	11/3/05	0745	X	X				
J10D49	SOIL								
J10D50	SOIL	11/3/05	0755	X	X				

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From M. Stankovich	Date/Time 11/3/05 1515	Received By/Stored In 3728/2C	Date/Time 11/3/05 1515
Relinquished By/Removed From 3728/2C	Date/Time 11/7/05 1000	Received By/Stored In [Signature]	Date/Time 11/7/05 1000
Relinquished By/Removed From [Signature]	Date/Time 11/7/05 1000	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 11/08/05	Received By/Stored In [Signature]	Date/Time 11/08/05 9:45
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

(2) ICP Metals - 6010TR (SV846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Matrix *

- S=Soil
- SE=Soil/Element
- 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

Appendix 5

Data Validation Supporting Documentation

000017

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	100-D-24		DATA PACKAGE: K0093		
VALIDATOR:	FJP	LAB: LLE	DATE: 12/31/05		
			SDG:	K0093	
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	<u>Tritium</u>	<u>2-19</u>		
SAMPLES/MATRIX					
J10D47 J10D48 J10D50					
soil					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

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

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

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

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

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

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

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

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

Field blank results acceptable? Yes No N/A

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

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

Comments: no FB

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

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

LCS/BSS recoveries acceptable? Yes No N/A

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

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

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

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

Comments: _____

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

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

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

Tracer recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

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

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

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

Comments: NO MS C-14 → 3H - J ed

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

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments: _____

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: _____ *n.c. FS or PAS*

K-40 6590

rg-224(4770) rc-224(622) th-224(699) th-232(4720) - no

qual

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: 5 over

Appendix 6

Additional Documentation Requested by Client

000024

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0093

R511098-05

Method Blank

METHOD BLANK

SDG <u>7769</u>	Client/Case no <u>Hanford</u>	<u>SDG K0093</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R511098-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7769-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-029</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	1.08	2.7	4.9	10	U	93A
Gross Beta	12587-47-2	1.12	3.6	5.9	15	U	93B
Tritium	10028-17-8	0.716	1.5	2.5	400	U	H
Carbon 14	14762-75-5	-0.749	2.3	4.0	50	U	C
Uranium 233/234	U-233/234	0	0.060	0.23	1.0	U	U
Uranium 235	15117-96-1	0.036	0.072	0.28	1.0	U	U
Uranium 238	U-238	0	0.060	0.23	1.0	U	U
Potassium 40	13966-00-2	U		0.29		U	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Radium 226	13982-63-3	U		0.059	0.10	U	GAM
Radium 228	15262-20-1	U		0.081	0.20	U	GAM
Europium 152	14683-23-9	U		0.045	0.10	U	GAM
Europium 154	15585-10-1	U		0.061	0.10	U	GAM
Europium 155	14391-16-3	U		0.043	0.10	U	GAM
Thorium 228	14274-82-9	U		0.026		U	GAM
Thorium 232	TH-232	U		0.081		U	GAM
Uranium 235	15117-96-1	U		0.058		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.055		U	GAM

Remaining Sites Confirm.Samp. - Soil

QC-BLANK #55080

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 8

Lab id	<u>EBRLNE</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>3.06</u>
Report date	<u>12/01/05</u>

000025

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0093

R511098-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7769</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG K0093</u> Contract <u>No. 630</u>
Lab sample id <u>R511098-04</u> Dept sample id <u>7769-004</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAP No <u>RC-029</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST		pCi/g	pCi/g	%	(TOTAL)
Gross Alpha	204	17	4.3	10	93A	214	8.6	95	68-132	70-130
Gross Beta	205	11	6.0	15	93B	198	7.9	104	75-125	70-130
Tritium	676	15	4.7	400	H	705	28	96	84-116	80-120
Carbon 14	1580	15	3.7	50	C	1600	64	99	84-116	80-120
Uranium 233/234	19.1	2.1	0.96	1.0	U	18.6	0.74	103	80-120	80-120
Uranium 235	15.4	1.8	0.24	1.0	U	15.1	0.60	102	80-120	80-120
Uranium 238	18.7	2.1	0.92	1.0	U	20.2	0.81	93	82-118	80-120
Cobalt 60	0.615	0.056	0.026	0.050	GAM	0.560	0.022	110	71-129	80-120
Cesium 137	0.565	0.044	0.031	0.10	GAM	0.557	0.022	101	74-126	80-120

Remaining Sites Confirm.Samp. - Soil

QC-LCS #55079

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 9

000026

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>12/01/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0093

R511098-06

J10D48

DUPLICATE

SDG <u>7769</u>		Client/Case no <u>Hanford</u>	SDG <u>K0093</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>R511098-06</u>	Lab sample id <u>R511098-02</u>	Client sample id <u>J10D48</u>	
Dept sample id <u>7769-006</u>	Dept sample id <u>7769-002</u>	Location/Matrix <u>100-D-24</u>	SOLID
	Received <u>11/08/05</u>	Collected/Weight <u>11/03/05 07:45 1671 g</u>	
% solids <u>93.1</u>	% solids <u>93.1</u>	Custody/SAF No <u>RC-029-002</u>	<u>RC-029</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER	
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	σ
Gross Alpha	8.41	3.6	3.1	10		93A	9.14	3.9	3.6	8	100	0.2	
Gross Beta	16.8	4.2	5.4	15		93B	21.9	4.9	6.4	26	59	1.3	
Tritium	0.547	1.4	2.3	400	U	H	-0.044	1.4	2.3	U	-	0.6	
Carbon 14	-1.83	2.0	3.5	50	U	C	-0.432	2.0	3.4	U	-	1.0	
Uranium 233/234	0.472	0.29	0.28	1.0		U	0.406	0.25	0.24		15	131	0.3
Uranium 235	0	0.088	0.34	1.0	U	U	0.038	0.076	0.29	U	-	0.7	
Uranium 238	0.800	0.37	0.28	1.0		U	0.657	0.32	0.24		20	101	0.6
Potassium 40	10.3	0.58	0.27			GAM	11.1	0.90	0.45		7	35	0.6
Cobalt 60	U		0.029	0.050	U	GAM	U		0.041	U	-	0.5	
Cesium 137	U		0.029	0.10	U	GAM	U		0.038	U	-	0.4	
Radium 226	0.447	0.058	0.053	0.10		GAM	0.481	0.082	0.075		7	45	0.5
Radium 228	0.556	0.13	0.14	0.20		GAM	0.707	0.22	<u>0.22</u>		24	69	1.0
Europium 152	U		0.063	0.10	U	GAM	U		0.091	U	-	0.5	
Europium 154	U		0.10	0.10	U	GAM	U		<u>0.13</u>	U	-	0.4	
Europium 155	U		0.10	0.10	U	GAM	U		0.10	U	-	0	
Thorium 228	0.560	0.033	0.031			GAM	0.544	0.047	0.048		3	35	0.2
Thorium 232	0.556	0.13	0.14			GAM	0.707	0.22	0.22		24	69	1.0
Uranium 235	U		0.13		U	GAM	U		0.14	U	-	0.1	
Uranium 238	U		3.4		U	GAM	U		4.4	U	-	0.4	
Americium 241	U		0.22		U	GAM	U		0.15	U	-	0.5	

Remaining Sites Confirm.Samp. - Soil

QC-DUP#2 55081

000027

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>12/01/05</u>

Date: 5 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil – Waste Site 100-D-24
Subject: Volatile - Data Package No. K0093

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0093-LLI 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
J10D47	11/3/05	Soil	C	See note 1
J10D48	11/3/05	Soil	C	See note 1
J10D50	11/3/05	Soil	C	See note 1

1 – Volatile organics by 8260B.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) 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 analyzed within 14 days of the date of sample collection.

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".

000001

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, the methylene chloride result in all samples were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

· **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.

All accuracy results were acceptable.

000002

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 duplicate samples (J10D47/J10D48) 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.

000003

Twenty-four analytes were reported above the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

• **Completeness**

Data package No. K0093-LLI 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 method blank contamination, the methylene chloride results in all samples were qualified as undetected, raised to the RQL and flagged "U".

Twenty-four analytes were reported above the RQL. Under the BHI 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).

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Appendix 2
Summary of Data Qualification

000007

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG# 0008		REVIEWER	Project # 000524	PAGE 1 OF 1
COMMENTS:				
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON	
Methylene chloride	U at RQL	All	Blank contamination	

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD							
Laboratory: LLI							
Case:		SDG: K0093					
Sample Number		J10D47		J10D48		J10D50	
Remarks		Duplicate					
Sample Date		11/3/05		11/3/05		11/3/05	
Analysis Date		11/15/05		11/15/05		11/15/05	
VOA	RQL	Result	Q	Result	Q	Result	Q
Chloromethane	10	13 U		11 U		14 U	
Bromomethane	10	13 U		11 U		14 U	
Vinyl Chloride	10	13 U		11 U		14 U	
Chloroethane	10	13 U		11 U		14 U	
Methylene Chloride	10	10 U		10 U		10 U	
Acetone	10	13 U		11 U		14 U	
Carbon Disulfide	10	6 U		6 U		7 U	
1,1-Dichloroethene	10	6 U		6 U		7 U	
1,1-Dichloroethane	10	6 U		6 U		7 U	
1,2-Dichloroethene (total)	10	6 U		6 U		7 U	
Chloroform	10	6 U		6 U		7 U	
1,2-Dichloroethane	10	6 U		6 U		7 U	
2-Butanone	10	13 U		11 U		14 U	
1,1,1-Trichloroethane	10	6 U		6 U		7 U	
Carbon Tetrachloride	10	6 U		6 U		7 U	
Bromodichloromethane	10	6 U		6 U		7 U	
1,2-Dichloropropane	10	6 U		6 U		7 U	
cis-1,3-Dichloropropene	10	6 U		6 U		7 U	
Trichloroethene	10	6 U		6 U		7 U	
Dibromochloromethane	10	6 U		6 U		7 U	
1,1,2-Trichloroethane	10	6 U		6 U		7 U	
Benzene	10	6 U		6 U		7 U	
trans-1,3-Dichloropropene	10	6 U		6 U		7 U	
Bromoform	10	6 U		6 U		7 U	
4-Methyl-2-pentanone	10	13 U		11 U		14 U	
2-Hexanone	10	13 U		11 U		14 U	
Tetrachloroethene	10	6 U		6 U		7 U	
1,1,2,2-Tetrachloroethane	10	6 U		6 U		7 U	
Toluene	10	6 U		6 U		7 U	
Chlorobenzene	10	6 U		6 U		7 U	
Ethylbenzene	10	6 U		6 U		7 U	
Styrene	10	6 U		6 U		7 U	
Xylene	10	6 U		6 U		7 U	
cis-1,2-Dichloroethene	10	6 U		6 U		7 U	
trans-1,2-Dichloroethene	10	6 U		6 U		7 U	

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Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

Report Date: 11/18/05 12:38

RFW Batch Number: 0511L660

Client: TNUHANFORD RC-029 K0093 Work Order: 11343606001 Page: 1a

Cust ID:	J10D47	J10D48	J10D50	J10D50	J10D50	VBLKIR
Sample Information	RFW#: 001	002	004	004 MS	004 MSD	05LVG327-MB1
	Matrix: SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.: 1.16	1.00	1.19	0.926	0.926	1.00
	Units: UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Toluene-d8	98 %	96 %	98 %	108 %	102 %	102 %
Surrogate Bromofluorobenzene	100 %	98 %	97 %	112 %	110 %	103 %
Recovery 1,2-Dichloroethane-d4	105 %	108 %	109 %	112 %	108 %	113 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl						
Chloromethane	13 U	11 U	14 U	64 %	67 %	10 U
Bromomethane	13 U	11 U	14 U	90 %	90 %	10 U
Vinyl Chloride	13 U	11 U	14 U	74 %	73 %	10 U
Chloroethane	13 U	11 U	14 U	142 %	111 %	10 U
Methylene Chloride	106 ^{11/14/05} JB U	105 ^{11/14/05} JB U	107 ^{11/14/05} JB U	141 %	136 %	2 J
Acetone	13 U	11 U	14 U	153 %	183 %	10 U
Carbon Disulfide	6 U	6 U	7 U	113 %	105 %	5 U
1,1-Dichloroethene	6 U	6 U	7 U	105 %	100 %	5 U
1,1-Dichloroethane	6 U	6 U	7 U	110 %	105 %	5 U
1,2-Dichloroethene (total)	6 U	6 U	7 U	104 %	97 %	5 U
Chloroform	6 U	6 U	7 U	110 %	104 %	5 U
1,2-Dichloroethane	6 U	6 U	7 U	116 %	108 %	5 U
2-Butanone	13 U	11 U	14 U	89 %	98 %	10 U
1,1,1-Trichloroethane	6 U	6 U	7 U	114 %	107 %	5 U
Carbon Tetrachloride	6 U	6 U	7 U	114 %	106 %	5 U
Bromodichloromethane	6 U	6 U	7 U	112 %	107 %	5 U
1,2-Dichloropropane	6 U	6 U	7 U	110 %	106 %	5 U
cis-1,3-Dichloropropene	6 U	6 U	7 U	111 %	103 %	5 U
Trichloroethene	6 U	6 U	7 U	116 %	106 %	5 U
Dibromochloromethane	6 U	6 U	7 U	109 %	102 %	5 U
1,1,2-Trichloroethane	6 U	6 U	7 U	102 %	98 %	5 U
Benzene	6 U	6 U	7 U	107 %	101 %	5 U
Trans-1,3-Dichloropropene	6 U	6 U	7 U	115 %	108 %	5 U
Bromoform	6 U	6 U	7 U	110 %	105 %	5 U
4-Methyl-2-pentanone	13 U	11 U	14 U	99 %	122 %	10 U
2-Hexanone	13 U	11 U	14 U	89 %	110 %	10 U
Tetrachloroethene	6 U	6 U	7 U	106 %	97 %	5 U
1,1,2,2-Tetrachloroethane	6 U	6 U	7 U	106 %	110 %	5 U
Toluene	6 U	6 U	7 U	110 %	101 %	5 U

*= Outside of EPA CLP QC limits.

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Cust ID: J10D47 J10D48 J10D50 J10D50 J10D50 VBLKIR

RFW#: 001 002 004 004 MS 004 MSD 05LVG327-MB1

	001	002	004	004 MS	004 MSD	05LVG327-MB1
Chlorobenzene	6 U	6 U	7 U	106 %	96 %	5 U
Ethylbenzene	6 U	6 U	7 U	107 %	95 %	5 U
Styrene	6 U	6 U	7 U	109 %	102 %	5 U
Xylene (total)	6 U	6 U	7 U	109 %	98 %	5 U
M&P Xylene	6 U	6 U	7 U	108 %	97 %	5 U
O-Xylene	6 U	6 U	7 U	110 %	101 %	5 U
cis-1,2-Dichloroethene	6 U	6 U	7 U	102 %	97 %	5 U
trans-1,2-Dichloroethene	6 U	6 U	7 U	106 %	97 %	5 U

*- Outside of EPA CLP QC limits.

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Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 11/18/05 12:38

RFW Batch Number: 0511L660

Client: TNUHANFORD RC-029 K0093

Work Order: 11343606001 Page: 2a

Cust ID: VBLKIL

VBLKIL BS

Sample	RFW#:	05LVG324-MB1	05LVG324-MB1
Information	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG

Surrogate	Recovery	Toluene-d8	97 %	104 %
		Bromofluorobenzene	99 %	109 %
		1,2-Dichloroethane-d4	106 %	106 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl				
Chloromethane		10 U	67 %	
Bromomethane		10 U	87 %	
Vinyl Chloride		10 U	77 %	
Chloroethane		10 U	122 %	
Methylene Chloride		1 J	96 %	
Acetone		10 U	130 %	
Carbon Disulfide		5 U	111 %	
1,1-Dichloroethene		5 U	103 %	
1,1-Dichloroethane		5 U	108 %	
1,2-Dichloroethene (total)		5 U	101 %	
Chloroform		5 U	105 %	
1,2-Dichloroethane		5 U	107 %	
2-Butanone		10 U	115 %	
1,1,1-Trichloroethane		5 U	108 %	
Carbon Tetrachloride		5 U	109 %	
Bromodichloromethane		5 U	108 %	
1,2-Dichloropropane		5 U	105 %	
cis-1,3-Dichloropropene		5 U	108 %	
Trichloroethene		5 U	120 %	
Dibromochloromethane		5 U	105 %	
1,1,2-Trichloroethane		5 U	99 %	
Benzene		5 U	104 %	
Trans-1,3-Dichloropropene		5 U	108 %	
Bromoform		5 U	102 %	
4-Methyl-2-pentanone		10 U	129 %	
2-Hexanone		10 U	160 %	
Tetrachloroethene		5 U	102 %	
1,1,2,2-Tetrachloroethane		5 U	95 %	
Toluene		5 U	105 %	

*= Outside of EPA CLP QC limits.

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11/4/06

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Cust ID: VBLKIL VBLKIL BS

RFW#: 05LVG324-MB1 05LVG324-MB1

Chlorobenzene	5	U	102	%
Ethylbenzene	5	U	105	%
Styrene	5	U	110	%
Xylene (total)	5	U	107	%
M&P Xylene	5	U	106	%
O-Xylene	5	U	110	%
cis-1,2-Dichloroethene	5	U	100	%
trans-1,2-Dichloroethene	5	U	101	%

*- Outside of EPA CLP QC limits.

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Case Narrative

Client: TNU-HANFORD RC-029
LVL #: 0511L660
SDG/SAF # K0093/RC-029

W.O. #: 11343-606-001-9999-00
Date Received: 11-08-2005

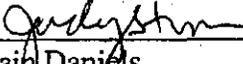
GC/MS VOLATILE

Three (3) soil samples were collected on 11-03-2005.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 11-15,16-2005.

The following is a summary of the QC results accompanying these 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 analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. One (1) of seventy-four (74) matrix spike recoveries was outside acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/21/05
Date

son\group\data\voe\tnu-hanford\0511-660.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 1 2 pages.

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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-029-002	Page 1 of 1
Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH		Price Code	Data Turnaround
Project Designation Remaining Sites Confirmation Sampling - Soil	Sample Location 100-D-24	SAF No. RC-029	Air Quality <input type="checkbox"/>		15 Days	
Ice Chest No. AFS-04-006	Field Logbook No. EL-1578-7	COA C10DR16700	Method of Shipment Fed Ex			
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060106	Bill of Lading/Air Bill No. See OSp				

POSSIBLE SAMPLE HAZARDS/REMARKS Non Rad Special Handling and/or Storage Cool 4°C	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C				
	Type of Container	G	G/P	G/P	G/P	aG	G				
	No. of Container(s)	1	1	1	1	1	1				
	Volume	100mL	60mL	250mL	120mL	250mL	60mL				

000017	SAMPLE ANALYSIS				See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7196	Signl-VOA - 8270A (TCL)	VOA - 8260A (TCL)				
	Sample No.	Matrix *	Sample Date	Sample Time									
	J10D47	SOIL	11/3/05	0745			X	X	X	X			
	J10D48	SOIL	11/3/05	0745			X	X	X	X			
	J10D49	SOIL	11/3/05	0730			X		X				
	J10D50	SOIL	11/3/05	0755			X	X	X	X			

CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)	S-Sol SS-Solvent SO-Solid SL-Sludge W - Water O-Oil A-Air DS-Dry Solid DL-Dry Liquid T-Tissue W1-Wipe L-Liquid Y-Yeast X-Other			
Mike Stankovich	11/3/05 1515	3728/2C	11/3/05 1515					
3728 R.E. ZC	11/7/05 1000	D. Stankovich	11/7/05 1000					
V. Stankovich	11/7/05 1000	Fed Ex						
F. Stankovich	11/9/05 0940	Receivng	11-9-05 0940					

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

Appendix 5
Data Validation Supporting Documentation

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GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D-24		DATA PACKAGE: K0093		
VALIDATOR:	TLI	LAB: LLI	DATE: 12/31/05		
			SDG: K0093		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10D47 J10D48 J10D50					
S&I					

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: MC - Wat RQL all no FB

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: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

- MS/MSD samples analyzed? Yes No N/A
- MS/MSD RPD values acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

- Internal standards analyzed? Yes No N/A
- Internal 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: 24 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: 5 January 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling – Soil –Waste Site 100-D-24
Subject: Wet Chemistry - Data Package No. K0093

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0093-LLI 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
J10D47	11/3/05	Soil	C	See note 1
J10D48	11/3/05	Soil	C	See note 1
J10D50	11/3/05	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) 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 other holding times were acceptable.

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- **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

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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 (J10D47/J10D48) 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 K0093-LLI 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.

000003

Appendix 1

Glossary of Data Reporting Qualifiers

000004

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).

000005

Appendix 2

Summary of Data Qualification

000006

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0093	REVIEWER: TLI	PROJECT: 100-D-24	PAGE <u>1</u> OF <u>1</u>
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.

000007

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000008

Project: WASHINGTON CLOSURE HANFORD								
Lab: LLI		SDG: K0093						
Sample Number		J10D47		J10D48		J10D50		
Remarks		Duplicate						
Sample Date		11/3/05		11/3/05		11/3/05		
Wet Chemistry		RQL	Result	Q	Result	Q	Result	Q
Chromium VI		0.5	0.22	U	0.22	U	0.24	

600000

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/16/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0511L660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10D47	‡ Solids Chromium VI	90.0 0.22 u	‡ MG/KG	0.01 0.22	1.0 1.0
-002	J10D48	‡ Solids Chromium VI	91.9 0.22 u	‡ MG/KG	0.01 0.22	1.0 1.0
-003	J10D49	‡ Solids	99.9	‡	0.01	1.0
-004	J10D50	‡ Solids Chromium VI	85.6 0.24	‡ MG/KG	0.01 0.23	1.0 1.0

JP
 11/16/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000011



Analytical Report

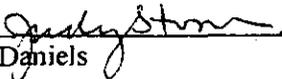
Client: TNU-HANFORD RC-029 K0093
LVL#: 0511L660

W.O.#: 11343-606-001-9999-00
Date Received: 11-08-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank for Chromium VI was within the method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analysis for Chromium VI was outside the 20% Relative Percent Difference (RPD) control limit that may be attributed to sample inhomogeneity.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/17/05
Date

njp011-660

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

000012

02

Collector STANKOVICH/HUDSON	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KESSNER, JH	Price Code	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Soil	Sample Location 100-D-24	SAF No. RC-029	Air Quality <input type="checkbox"/>		
Ice Chest No. AFS-04-006	Field Logbook No. EL-1378-7	COA C10DR16700	Method of Shipment Fed Ex		
Shipped To EDERLINE SERVICES / LIONVILLE	Offsite Property No. A060106	Bill of Lading/Air Bill No. See O&P			

POSSIBLE SAMPLE HAZARDS/REMARKS Non Rad Special Handling and/or Storage Cool 4°C	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C			
	Type of Container	G/P	G/P	G/P	G/P	G/P	G/P			
	No. of Container(s)	1	1	1	1	1	1			
	Volume	1000mL	60mL	250mL	120mL	250mL	60mL			

000013 SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium (hex - 7196)	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)					
-------------------------------	--------------------------------------	--------------------------------------	-----------------------	------------------------	-------------------	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time							
J10D47	SOIL	11/3/05	0745			X	X	X	X	
J10D48	SOIL	11/3/05	0745			X	X	X	X	
J10D49	SOIL	11/3/05	0730			X		X		
J10D50	SOIL	11/3/05	0755			X	X	X	X	

CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS						Matrix *	
Relinquished By/Removed From <i>[Signature]</i> 11/3/05	Date/Time 11/3/05	Received By/Stored In <i>[Signature]</i> 3728/2C	Date/Time 11/3/05 1515	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Sr; Technetium-99; isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Total Uranium (2) ICP Metals - 6010TR (SWB46) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)						S-Salt SS-Solids SO-Solids SW-Water O-Oil A-Air DS-Drum Solids DL-Drum Liquids T-Tissue W-Wipe L-Liquid V-Vegetation X-Other	
Relinquished By/Removed From <i>[Signature]</i> 3728 Ref 2C	Date/Time 11/7/05 1000	Received By/Stored In <i>[Signature]</i> Fed Ex	Date/Time 11/7/05 1000								
Relinquished By/Removed From <i>[Signature]</i> Fed Ex	Date/Time 11/7/05 1000	Received By/Stored In <i>[Signature]</i> Fed Ex	Date/Time 11/7/05 0940								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time								

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

Appendix 5

Data Validation Supporting Documentation

000014

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-0-24		DATA PACKAGE: K0093		
VALIDATOR:	TLI	LAB:	LLP	DATE: 12/31/05	
			SDG: K0093		
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					
J10D47 J10D48 J10D50					
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
Spike 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 PS

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

000019

Knoxville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/05

CLIENT: TUNHAMFORD RC-029 X0093
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05111660

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK0	051V1079-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

000020

06 06

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/16/05

CLIENT: TNUHANFORD RC-029 K0093
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05111660

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J10D47	Soluble Chromium VI	4.5	0.22u	4.4	98.6	1.0
		Insoluble Chromium VI	1200	0.22u	1120	107.2	100
BLANK10	05LVI079-MB1	Soluble Chromium VI	3.9	0.20u	4.0	97.7	1.0
		Insoluble Chromium VI	1320	0.20u	1170	113.0	100

000021

07

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/16/05

CLIENT: TNUHANFORD RC-029 K0093
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05111660

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J10D47	Chromium VI	0.22u	0.26	0.1765 100	1.0

000022

08