

**SAF-B05-014**  
**182-F Remaining Sites – Full Protocol**  
**FINAL VALIDATION PACKAGE**

**COMPLETE COPY OF VALIDATION PACKAGE TO:**

Jeanette Duncan 2 copies clipped *mip* 8-16-05  
INITIAL/DATE

**SDG H3142**

**Sample Location/Waste Site: 182-F**

**RECEIVED**  
SEP 01 2005  
EDMC

Date: 15 July 2005  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: 182-F Remaining Sites - Soil Full Protocol  
Subject: Radiochemistry - Data Package No. H3142-EB (SDG No. H3142)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H3142 prepared by Eberline Services Inc. (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	Waste Site	Analysis
J03342	4/29/05	Soil	C	182-F	See note 1
J03343	4/29/05	Soil	C	182-F	See note 1
J03344	4/29/05	Soil	C	182-F	See note 1

1- Gamma spectroscopy, gross alpha/beta, carbon-14 and tritium.

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 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.

**000001**

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

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

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (43%), all radium-226 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

#### Field Duplicate

No field duplicates were submitted for analysis.

- **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. Seventeen analytes exceeded the RQL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific RQL.

- **Completeness**

Data package No. H3142 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### **MINOR DEFICIENCIES**

Due to an RPD outside QC limits (43%), all radium-226 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.

Seventeen analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

#### **REFERENCES**

FHI, Contract #20266, *Validation Statement of Work*, Bechtel 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**

000005

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

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

**Appendix 2**  
**Summary of Data Qualification**

**000007**

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: H3142	REVIEWER: TLI	PROJECT: 182-F	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Radium-226	J	All	RPD

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

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

Project: BECHTEL-HANFORD									
Laboratory: EB									
Case	SDG: H3142								
Sample Number	J03342			J03343			J03344		
Remarks									
Sample Date	4/29/05			4/29/05			4/29/05		
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		6.64		3.35	U			8.26	
Gross Beta		17.3		17.0				19.8	
Tritium		-0.087	U	0.798	U			-0.732	U
Carbon-14	1	-0.687	U*	-0.422	U*			-2.92	U*
Potassium-40		6.82		12.8				10.0	
Cobalt 60	0.05		U*		U*				U*
Cesium 137	0.05		U*	0.111					U*
Radium-226		0.397	J	0.414	J			0.557	J
Radium-228			U	0.860					U
Europium 152	0.1		U*		U*				U*
Europium 154	0.1		U*		U*				U*
Europium 155	0.1		U*		U*				U*
Thorium-228		0.661		0.618				0.633	
Thorium-232			U	0.860					U
Uranium-235(gea)			U		U				U
Uranium-238(gea)			U		U				U
Americium-241(gea)			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 H3142**

7820-001

J03342

**DATA SHEET**

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505001-01</u>	Client sample id <u>J03342</u>	
Dept sample id <u>7820-001</u>	Location/Matrix <u>182 F at 100 F Area</u>	<u>SOLID</u>
Received <u>04/30/05</u>	Collected/Weight <u>04/29/05 09:45</u>	<u>679 g</u>
% solids <u>95.8</u>	Custody/SAF No <u>B05-014-001</u>	<u>B05-014</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	6.64	4.2	4.5	10		93A
Gross Beta	12587-47-2	17.3	5.0	6.6	15		93B
Tritium	10028-17-8	-0.087	3.2	5.5	400	U	H
Carbon 14	14762-75-5	-0.687	2.8	4.7	50	U	C
Potassium 40	13966-00-2	6.82	1.0	0.77			GAM
Cobalt 60	10198-40-0	U		<u>0.080</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.11</u>	0.10	U	GAM
Radium 226	13982-63-3	0.397	0.14	<u>0.11</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.61</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.24</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.24</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.22</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.661	0.13	0.12			GAM
Thorium 232	TH-232	U		0.61		U	GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		8.7		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM

182-F Remaining Sites-Soil Full Prot

*Handwritten:*  
 ✓  
 7/14/05

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>07/07/05</u>

**000011**

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3142**

7820-002

J03343

**DATA SHEET**

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R505001-02</u>	Client sample id <u>J03343</u>	
Dept sample id <u>7820-002</u>	Location/Matrix <u>182 F at 100 F Area</u>	<u>SOLID</u>
Received <u>04/30/05</u>	Collected/Weight <u>04/29/05 10:00</u>	<u>672 g</u>
% solids <u>94.4</u>	Custody/SAF No <u>B05-014-001</u>	<u>B05-014</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	3.35	3.6	5.1	10	U	93A
Gross Beta	12587-47-2	17.0	4.8	6.2	15		93B
Tritium	10028-17-8	0.798	3.7	6.4	400	U	H
Carbon 14	14762-75-5	-0.422	3.1	5.2	50	U	C
Potassium 40	13966-00-2	12.8	1.5	0.68			GAM
Cobalt 60	10198-40-0	U		<u>0.087</u>	0.050	U	GAM
Cesium 137	10045-97-3	0.111	0.071	0.090	0.10		GAM
Radium 226	13982-63-3	0.414	0.13	<u>0.14</u>	0.10	J	GAM
Radium 228	15262-20-1	0.860	0.34	<u>0.32</u>	0.20		GAM
Europium 152	14683-23-9	U		<u>0.23</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.27</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.20</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.618	0.092	0.10			GAM
Thorium 232	TH-232	0.860	0.34	0.32			GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM

182-F Remaining Sites-Soil Full Prot

*✓*  
7/14/05

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>07/07/05</u>

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**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3142**

7820-003

J03344

**D A T A   S H E E T**

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505001-03</u>	Client sample id <u>J03344</u>	
Dept sample id <u>7820-003</u>	Location/Matrix <u>182 F at 100 F Area</u>	<u>SOLID</u>
Received <u>04/30/05</u>	Collected/Weight <u>04/29/05 10:15</u>	<u>633 g</u>
% solids <u>94.3</u>	Custody/SAF No <u>B05-014-001</u>	<u>B05-014</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	8.26	4.7	4.9	10		93A
Gross Beta	12587-47-2	19.8	5.1	6.6	15		93B
Tritium	10028-17-8	-0.732	3.3	5.8	400	U	H
Carbon 14	14762-75-5	-2.92	2.9	5.1	50	U	C
Potassium 40	13966-00-2	10.0	1.8	1.5			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.557	0.22	0.24	0.10	J	GAM
Radium 228	15262-20-1	U		1.1	0.20	U	GAM
Europium 152	14683-23-9	U		0.27	0.10	U	GAM
Europium 154	15585-10-1	U		0.45	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.633	0.12	0.13			GAM
Thorium 232	TH-232	U		1.1		U	GAM
Uranium 235	15117-96-1	U		0.35		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM

182-F Remaining Sites-Soil Full Prot

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*7/14/05*

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>07/07/05</u>

000013

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000014**

**1.0 GENERAL**

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3142 was composed of three soil samples designated under SAF No. B05-014 with a Project Designation of: 182-F Remaining Sites – Soil Full Protocol.

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 BHI via e-mail on May 3, 2005 and July 7, 2005.

**2.0 ANALYSIS NOTES**

**2.1 Gross Alpha and Gross Beta Analyses**

No problems were encountered during the course of the analyses.

**2.2 Tritium Analyses**

No problems were encountered during the course of the analyses.

**2.3 Carbon-14 Analyses**

No problems were encountered during the course of the analyses.

**2.4 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

  
\_\_\_\_\_  
Date



**Appendix 5**  
**Data Validation Supporting Documentation**

**000017**

**APPENDIX A  
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	182-F 100mg		DATA PACKAGE: H3142		
VALIDATOR:	TLI	LAB:	ER	DATE: 7/14/03	
			SDG:	H3142	
<b>ANALYSES PERFORMED</b>					
<del>Sense Alpha/Beta</del>	Strontium-90	Technetium-99	Alpha Spectroscopy	<del>Gamma Spectroscopy</del>	
Total Uranium	Radium-22	<b>Tritium</b>	<b>C-14</b>		
<b>SAMPLES/MATRIX</b>					
J03342 J03343 J03344					
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)

~~Y~~ 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).....

~~Y~~ 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: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

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

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

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

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

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

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

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

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

Comments: RC-226 43% J all

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

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

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

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

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

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

Comments: no full QC

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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: 17 *[Signature]*

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**Appendix 6**  
**Additional Documentation Requested by Client**

**000024**

EBERLINE SERVICES / RICHMOND  
 SAMPLE DELIVERY GROUP H3142

7820-005

Method Blank

METHOD BLANK

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505001-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7820-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B05-014</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.003	1.8	4.2	10	U	93A
Gross Beta	12587-47-2	-1.78	3.5	6.4	15	U	93B
Tritium	10028-17-8	-0.462	3.4	5.9	400	U	H
Carbon 14	14762-75-5	<u>-3.06</u>	2.9	5.0	50	U	C

182-F Remaining Sites-Soil Full Prot

QC-BLANK 52732
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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>07/07/05</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3142

7820-009

Method Blank

METHOD BLANK

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505001-09</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7820-009</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B05-014</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		1.2		U	GAM
Cobalt 60	10198-40-0	U		<u>0.072</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.11</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.31</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.17</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.17</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.16</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.081		U	GAM
Thorium 232	TH-232	U		0.31		U	GAM
Uranium 235	15117-96-1	U		0.20		U	GAM
Uranium 238	U-238	U		7.2		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM

182-F Remaining Sites-Soil Full Prot

QC-BLANK 53403
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METHOD BLANKS  
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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>07/07/05</u>

000026

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3142

7820-004

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7820</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H3142</u> Contract No. <u>630</u>
Lab sample id <u>R505001-04</u> Dept sample id <u>7820-004</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B05-014</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)	LIMITS
Gross Alpha	96.0	13	4.5	10		93A	102	4.1	94	65-135	70-130
Gross Beta	105	8.6	6.1	15		93B	100	4.0	105	72-128	70-130
Tritium	953	43	14	400		H	973	39	98	83-117	80-120
Carbon 14	1910	39	11	50		C	2130	85	90	85-115	80-120

182-F Remaining Sites-Soil Full Prot

QC-LCS 52731

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LCS  
 Version 3.06  
 Report date 07/07/05

000027



EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3142

7820-096

J03342

DUPLICATE

SDG <u>7820</u>	Client/Case no <u>Hanford</u>	SDG <u>H3142</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R505001-06</u>	Lab sample id <u>R505001-01</u>	Client sample id <u>J03342</u>
Dept sample id <u>7820-096</u>	Dept sample id <u>7820-001</u>	Location/Matrix <u>182 F at 100 F Area</u> <u>SOLID</u>
	Received: <u>04/30/05</u>	Collected/Weight <u>04/29/05 09:45</u> <u>679 g</u>
% solids <u>95.8</u>	% solids <u>95.8</u>	Custody/SAP No <u>B05-014-001</u> <u>B05-014</u>

ANALYTE	DUPLICATE pci/g	2σ ERR (COUNT)	MDA pci/g	RDL pci/g	QUALI- FIERS	TEST	ORIGINAL pci/g	2σ ERR (COUNT)	MDA pci/g	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
Tritium	2.44	3.0	5.0	400	U	H	-0.087	3.2	5.5	U	-		
Carbon 14	-2.08	2.5	4.3	50	U	C	-0.587	2.3	4.7	U	-		

182-F Remaining Sites-Soil Full Prot

QC-DUP#1 52733

Lab id EBERLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-DUP  
Version 3.06  
Report date 07/27/05

000029

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3142

7820-007

J03343

**DUPLICATE**

SDG <u>7820</u> Contact <u>Melissa C. Mannion</u> Duplicates Lab sample id <u>R505001-07</u> Dept sample id <u>7820-007</u> % solids <u>94.4</u>	ORIGINAL Lab sample id <u>R505001-02</u> Dept sample id <u>7820-002</u> Received <u>04/30/05</u> % solids <u>94.1</u>	Client/Case no <u>Hanford</u> SDG <u>H3142</u> Contract No. <u>630</u> Client sample id <u>J03343</u> Location/Matrix <u>182 F at 100 F Area</u> <u>SOLID</u> Collected/Weight <u>04/29/05 10:00</u> <u>572 g</u> Custody/SAP No <u>805-014-001</u> <u>805-014</u>
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ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
Gross Alpha	3.66	3.5	4.8	10	U	93A	3.25	3.6	5.1	U	-		
Gross Beta	15.8	5.5	7.9	15		93B	17.0	4.8	6.2		7	74	

182-F Remaining Sites-Soil Full Prot

QC-DUP#2 52734

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>1.05</u>
Report date <u>05/07/05</u>

000030

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3142

7820-010

J03343

DUPLICATE

SDG 7820		Client/Case no Hanford		SDG 33142
Contact <u>Melissa C. Mannion</u>		Contract No. 630		
DUPLICATE		ORIGINAL		
Lab sample id <u>R505001-10</u>	Lab sample id <u>R505001-02</u>	Client sample id <u>J03343</u>		
Dept sample id <u>7820-010</u>	Dept sample id <u>7820-002</u>	Location/Matrix <u>182 F at 100 F Area</u> SOLID		
	Received <u>04/30/05</u>	Collected/Weight <u>04/29/05 10:00</u> 672 g		
% solids <u>94.4</u>	% solids <u>94.4</u>	Custody/SAF No <u>805-014-001</u> 805-014		

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
Potassium 40	13.2	1.6	0.60			GAM	12.8	1.5	0.68		3	41	
Cobalt 60	U		0.076	0.050	U	GAM	U		0.087	U	-		
Cesium 137	0.166	0.063	0.075	0.10		GAM	0.111	0.071	0.090		40	108	
Radium 226	0.639	0.16	0.15	0.10		GAM	0.414	0.13	0.14		43	67	
Radium 228	0.672	0.34	0.36	0.30		GAM	0.960	0.34	0.32		25	99	
Europium 152	U		0.22	0.10	U	GAM	U		0.23	U	-		
Europium 154	U		0.30	0.10	U	GAM	U		0.27	U	-		
Europium 155	U		0.21	0.10	U	GAM	U		0.20	U	-		
Thorium 226	0.776	0.14	0.16			GAM	0.518	0.092	0.10		23	48	
Thorium 232	0.572	0.34	0.35			GAM	0.860	0.34	0.32		25	99	
Uranium 235	U		0.33		U	GAM	U		0.29	U	-		
Uranium 238	U		9.2		U	GAM	U		11	U	-		
Americium 241	U		0.36		U	GAM	U		0.32	U	-		

182-F Remaining Sites-Soil Full Prot

QC-DUP#2 53404

Lab id <u>EBERLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>QC-DUP</u>
Version <u>1.06</u>
Report date <u>07/07/05</u>

000031

DUPLICATES  
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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>07/07/05</u>

**000031**

Date: 15 July 2005  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: 182-F Remaining Sites - Soil Full Protocol  
Subject: Inorganic - Data Package No. H3142-LLI (SDG No. H3142)

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H3142 -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	Waste Site	Analysis
J03342	4/29/05	Soil	C	182-F	See note 1
J03343	4/29/05	Soil	C	182-F	See note 1
J03344	4/29/05	Soil	C	182-F	See note 1

1 - ICP metals; mercury by 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, 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 28 days for mercury and 6 months for ICP metals.

All holding times were met.

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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.

All preparation 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.

Due to a MS recovery outside QC limits (63%), all antimony results were qualified as estimates and flagged "J".

Due to a MS recovery outside QC limits (224%), all silicon results were qualified as estimates and flagged "J".

All other matrix spike recovery 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

No field duplicates were submitted for analysis.

- **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 reported results met the analyte specific RQL.

- **Completeness**

Data package No. H3142-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 a MS recovery outside QC limits (63%), all antimony results were qualified as estimates and flagged "J". Due to a MS recovery outside QC limits (224%), all silicon 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**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

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**

000005

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

**Appendix 2**  
**Summary of Data Qualification**

**000007**

INORGANIC DATA QUALIFICATION SUMMARY\*

SDG: H3142	REVIEWER: TLI	PROJECT: 182-F	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Silicon	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.

000008

**Appendix 3**  
**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

Project: BECHTEL-HANFORD		J03342		J03343		J03344	
Laboratory: LLJ		SDG: H3142					
Case	Sample Number	Remarks	4/29/05	4/29/05	4/29/05	4/29/05	4/29/05
Inorganics	RQL	Result	Q	Result	Q	Result	Q
Silver	0.2	0.05	U	0.05	U	0.05	U
Aluminum		6340		7900		7200	
Arsenic	10	4.7		6.4		7.1	
Boron		2.6		3.2		2.4	
Barium	2	63.7		79.0		78.6	
Beryllium		0.41		0.49		0.44	
Calcium		4060		5090		7130	
Cadmium	0.2	0.29		0.76		0.39	
Cobalt		6.1		6.9		6.3	
Chromium	1	12.2		22.6		13.0	
Copper		14.2		18.7		16.0	
Iron		16900		20500		18200	
Mercury	0.2	0.02	U	0.04		0.02	U
Potassium		1320		1560		1500	
Magnesium		4060		4630		4100	
Manganese		266		312		286	
Molybdenum		0.49		0.56		0.49	
Sodium		187		289		167	
Nickel		13.4		16.8		11.6	
Lead	5	14.0		58.7		19.8	
Antimony	0.6	0.21	UJ	0.50	J	0.25	J
Selenium		0.38	U	0.37	U	0.40	U
Silicon		344	J	258	J	291	J
Vanadium		39.3		49.1		40.2	
Zinc	1	57.4		139		83.7	

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014 **H3142**  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L362

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03342	Silver, Total	0.05	u MG/KG	0.05	1.0
		Aluminum, Total	6340	MG/KG	0.88	1.0
		Arsenic, Total	4.7	MG/KG	0.27	1.0
		Boron, Total	2.6	MG/KG	0.16	1.0
		Barium, Total	63.7	MG/KG	0.02	1.0
		Beryllium, Total	0.41	MG/KG	0.009	1.0
		Calcium, Total	4060	MG/KG	0.73	1.0
		Cadmium, Total	0.29	MG/KG	0.04	1.0
		Cobalt, Total	6.1	MG/KG	0.07	1.0
		Chromium, Total	12.2	MG/KG	0.04	1.0
		Copper, Total	14.2	MG/KG	0.05	1.0
		Iron, Total	16900	MG/KG	0.79	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Potassium, Total	1320	MG/KG	0.79	1.0
		Magnesium, Total	4060	MG/KG	0.54	1.0
		Manganese, Total	266	MG/KG	0.02	1.0
		Molybdenum, Total	0.49	MG/KG	0.16	1.0
		Sodium, Total	187	MG/KG	0.14	1.0
		Nickel, Total	13.4	MG/KG	0.09	1.0
		Lead, Total	14.0	MG/KG	0.18	1.0
		Antimony, Total	0.21	u J MG/KG	0.21	1.0
		Selenium, Total	0.38	u MG/KG	0.38	1.0
		Silicon, Total	344	J MG/KG	0.55	1.0
		Vanadium, Total	39.3	MG/KG	0.06	1.0
		Zinc, Total	57.4	MG/KG	0.05	1.0

*Handwritten:* 7/15/05

000011

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION	
					LIMIT	FACTOR	
-002	J03343	Silver, Total	0.05	u	MG/KG	0.05	1.0
		Aluminum, Total	7900		MG/KG	0.87	1.0
		Arsenic, Total	6.4		MG/KG	0.27	1.0
		Boron, Total	3.2		MG/KG	0.16	1.0
		Barium, Total	79.0		MG/KG	0.02	1.0
		Beryllium, Total	0.49		MG/KG	0.009	1.0
		Calcium, Total	5090		MG/KG	0.72	1.0
		Cadmium, Total	0.78		MG/KG	0.04	1.0
		Cobalt, Total	6.9		MG/KG	0.06	1.0
		Chromium, Total	22.6		MG/KG	0.04	1.0
		Copper, Total	18.7		MG/KG	0.05	1.0
		Iron, Total	20500		MG/KG	0.78	1.0
		Mercury, Total	0.04		MG/KG	0.02	1.0
		Potassium, Total	1560		MG/KG	0.78	1.0
		Magnesium, Total	4630		MG/KG	0.53	1.0
		Manganese, Total	312		MG/KG	0.02	1.0
		Molybdenum, Total	0.56		MG/KG	0.16	1.0
		Sodium, Total	289		MG/KG	0.14	1.0
		Nickel, Total	16.8		MG/KG	0.09	1.0
		Lead, Total	58.7		MG/KG	0.18	1.0
		Antimony, Total	0.50	J	MG/KG	0.20	1.0
		Selenium, Total	0.37	u	MG/KG	0.37	1.0
		Silicon, Total	258	J	MG/KG	0.54	1.0
		Vanadium, Total	49.1		MG/KG	0.06	1.0
		Zinc, Total	139		MG/KG	0.05	1.0

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7/15/05

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-003	J03344	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Aluminum, Total	7200	MG/KG	0.95	1.0
		Arsenic, Total	7.1	MG/KG	0.29	1.0
		Boron, Total	2.4	MG/KG	0.17	1.0
		Barium, Total	78.6	MG/KG	0.02	1.0
		Beryllium, Total	0.44	MG/KG	0.01	1.0
		Calcium, Total	7130	MG/KG	0.79	1.0
		Cadmium, Total	0.39	MG/KG	0.04	1.0
		Cobalt, Total	6.3	MG/KG	0.07	1.0
		Chromium, Total	13.0	MG/KG	0.04	1.0
		Copper, Total	16.0	MG/KG	0.05	1.0
		Iron, Total	18200	MG/KG	0.85	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1500	MG/KG	0.85	1.0
		Magnesium, Total	4100	MG/KG	0.58	1.0
		Manganese, Total	286	MG/KG	0.02	1.0
		Molybdenum, Total	0.49	MG/KG	0.17	1.0
		Sodium, Total	167	MG/KG	0.15	1.0
		Nickel, Total	11.6	MG/KG	0.10	1.0
		Lead, Total	19.8	MG/KG	0.19	1.0
		Antimony, Total	0.25 J	MG/KG	0.22	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Silicon, Total	291 J	MG/KG	0.59	1.0
		Vanadium, Total	40.2	MG/KG	0.06	1.0
		Zinc, Total	83.7	MG/KG	0.05	1.0

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7/15/05

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**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**000014**



## Analytical Report

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Client: TNU-HANFORD B05-014  
LVL#: 0504L362  
SDG/SAF#: H3142/B05-014

W.O.#: 11343-606-001-9999-00  
Date Received: 04-30-05

### METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All 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. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

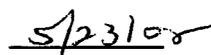
**000015**

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of **19** pages.

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J03342	Aluminum	20,000	97.5
	Iron	40,000	93.4
	Antimony	100	104.8
	Silicon	2,000	102.0

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. 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

  
 Date

jjw/m04-362



000016

05044362

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

B05-014-001

Price Code

Project Coordinator  
KESSNER, JH

Company Contact  
Doug Bowers

Telephone No.  
531-0701

Project Designation  
182-F Remaining Sites - Soil Full Protocol

Sampling Location  
182 F at 100 F area

SAF No.  
B05-014

Air Quality

Data Turnaround  
ASAP

Chest No. ERC-03-016

Field Logbook No.  
EL-1590

COA  
R182F02600

Method of Shipment  
Fed Ex

Shipped To  
EBERLINE SERVICES ALIONVILLE

Offsite Property No.  
A050207

COA

Method of Shipment  
Fed Ex

Bill of Lading/Air Bill No.  
See OPR

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000017

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation			Volume	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	See item (2) in Special Instructions.	Carbon-14, Tritium, H <sub>2</sub> Gross Alpha, Gross Beta	None	None	None	
				Type of Container	No. of Container(s)	None										Cool 4C
3342	SOIL	4-29-07	0945	aG	1	aG	250mL		aG	250mL						
3343	SOIL		1000													
3344	SOIL		1017													

CHAIN OF POSSESSION

Acquired By/Removed From	Signature/Print Name	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time
Acquired By/Removed From	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)  
 (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable);

Matrix \*

- S=Soil
- SE=Soil/Stone
- SO=Solid
- SL=Sludge
- W=Water
- O=Oil
- A=Air
- DS=Drum Solids
- DL=Drum Liquids
- T=Traces
- W=Wipes
- L=Liquid
- V=Vegetation
- X=Other

LABORATORY SECTION

Date/Time

LABORATORY SECTION

Date/Time

**Appendix 5**  
**Data Validation Supporting Documentation**

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	182-F	<del>R/L</del> 1000	DATA PACKAGE: H3142		
VALIDATOR:	TLP	LAB: HLF	DATE: 7/14/03		
			SDG: H3142		
ANALYSES PERFORMED					
<b>SW-846/ICP</b>	SW-846/GFAA	<b>SW-846/Hg</b>	SW-846 Cyanide		
SAMPLES/MATRIX					
J03342		J03343		J03344	
Soil					

**1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE**

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

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

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

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

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

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

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

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. ICP QUALITY CONTROL (Levels D and E)**

- ICP serial dilution samples analyzed? ..... Yes No  N/A
- ICP serial dilution %D values acceptable? ..... Yes No  N/A
- ICP post digestion spike required? ..... Yes No  N/A
- ICP post digestion spike values acceptable? ..... Yes No  N/A
- Standards traceable? ..... Yes No  N/A
- Standards expired? ..... Yes No  N/A
- Transcription/calculation errors? ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

**7. FURNACE AA QUALITY CONTROL (Levels D and E)**

- Duplicate injections performed as required? ..... Yes No **N/A**
- Duplicate injection %RSD values acceptable? ..... Yes No **N/A**
- Analytical spikes performed as required? ..... Yes No **N/A**
- Analytical spike recoveries acceptable? ..... Yes No **N/A**
- Standards traceable? ..... Yes No **N/A**
- Standards expired? ..... Yes No **N/A**
- MSA performed as required? ..... Yes No **N/A**
- MSA results acceptable? ..... Yes No **N/A**
- Transcription/calculation errors? ..... Yes No **N/A**

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**

**9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix 6**  
**Additional Documentation Requested by Client**

**000024**

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/06/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
BLANK1	05L0233-MB1	Silver, Total	0.15	MG/KG	0.05	1.0
		Aluminum, Total	0.94 u	MG/KG	0.94	1.0
		Arsenic, Total	0.29 u	MG/KG	0.29	1.0
		Boron, Total	0.20	MG/KG	0.17	1.0
		Barium, Total	0.13	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Calcium, Total	2.8	MG/KG	0.78	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.07 u	MG/KG	0.07	1.0
		Chromium, Total	0.08	MG/KG	0.04	1.0
		Copper, Total	0.06	MG/KG	0.05	1.0
		Iron, Total	0.84 u	MG/KG	0.84	1.0
		Potassium, Total	3.7	MG/KG	0.84	1.0
		Magnesium, Total	1.1	MG/KG	0.57	1.0
		Manganese, Total	0.02 u	MG/KG	0.02	1.0
		Molybdenum, Total	0.17 u	MG/KG	0.17	1.0
		Sodium, Total	0.51	MG/KG	0.15	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
		Silicon, Total	0.58 u	MG/KG	0.58	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	05C0095-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

000025

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J03342	Silver, Total	4.5	0.05u	4.7	95.7	1.0
		Aluminum, Total	7470	6340	190	597.6*	1.0
		Arsenic, Total	182	4.7	190	93.3	1.0
		Boron, Total	90.6	2.6	94.9	92.7	1.0
		Barium, Total	252	63.7	190	99.5	1.0
		Beryllium, Total	5.0	0.41	4.7	97.6	1.0
		Calcium, Total	6510	4060	2370	103.1	1.0
		Cadmium, Total	4.7	0.29	4.7	93.8	1.0
		Cobalt, Total	50.8	6.1	47.5	94.1	1.0
		Chromium, Total	30.4	12.2	19.0	95.8	1.0
		Copper, Total	38.2	14.2	23.7	101.3	1.0
		Iron, Total	17400	16900	94.9	552.1*	1.0
		Mercury, Total	0.19	0.02u	0.17	111.4	1.0
		Potassium, Total	3560	1320	2370	94.5	1.0
		Magnesium, Total	6430	4060	2370	100.2	1.0
		Manganese, Total	319	266	47.5	112.4*	1.0
		Molybdenum, Total	90.4	0.49	94.9	94.7	1.0
		Sodium, Total	2540	187	2370	99.1	1.0
		Nickel, Total	57.3	13.4	47.5	92.4	1.0
		Lead, Total	60.0	14.0	47.5	96.8	1.0
		Antimony, Total	30.2	0.21u	47.5	63.6	1.0
		Selenium, Total	172	0.38u	190	90.4	1.0
		Silicon, Total	556	344	94.9	224.0	1.0
		Vanadium, Total	84.0	39.3	47.5	94.1	1.0
		Zinc, Total	105	57.4	47.5	100	1.0

000026

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L362

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	J03342	Silver, Total	0.05u	0.05u	NC	1.0
		Aluminum, Total	6340	6610	4.3	1.0
		Arsenic, Total	4.7	4.6	2.2	1.0
		Boron, Total	2.6	2.6	0.00	1.0
		Barium, Total	63.7	71.4	11.4	1.0
		Beryllium, Total	0.41	0.42	1.8	1.0
		Calcium, Total	4060	4090	0.77	1.0
		Cadmium, Total	0.29	0.47	45.9	1.0
		Cobalt, Total	6.1	5.9	3.3	1.0
		Chromium, Total	12.2	12.2	0.00	1.0
		Copper, Total	14.2	14.7	3.5	1.0
		Iron, Total	16900	17000	0.78	1.0
		Mercury, Total	0.02u	0.01u	NC	1.0
		Potassium, Total	1320	1260	4.7	1.0
		Magnesium, Total	4060	4010	1.1	1.0
		Manganese, Total	266	270	1.8	1.0
		Molybdenum, Total	0.49	0.55	11.3	1.0
		Sodium, Total	187	195	4.1	1.0
		Nickel, Total	13.4	12.4	7.8	1.0
		Lead, Total	14.0	16.8	18.2	1.0
		Antimony, Total	0.21u	0.20u	NC	1.0
		Selenium, Total	0.38u	0.37u	NC	1.0
		Silicon, Total	344	404	16.1	1.0
		Vanadium, Total	39.3	38.9	1.0	1.0
		Zinc, Total	57.4	70.1	19.9	1.0

000027

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/06/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
*****	*****	*****	*****	*****	*****	*****
LCS1	05L0233-LC1	Silver, LCS	49.8	50.0	MG/KG	99.6
		Aluminum, LCS	504	500	MG/KG	100.8
		Arsenic, LCS	956	1000	MG/KG	95.6
		Boron, LCS	488	500	MG/KG	97.7
		Barium, LCS	497	500	MG/KG	99.5
		Beryllium, LCS	24.9	25.0	MG/KG	99.6
		Calcium, LCS	2500	2500	MG/KG	99.8
		Cadmium, LCS	24.6	25.0	MG/KG	98.4
		Cobalt, LCS	250	250	MG/KG	100.2
		Chromium, LCS	50.4	50.0	MG/KG	100.8
		Copper, LCS	128	125	MG/KG	102.0
		Iron, LCS	503	500	MG/KG	100.6
		Potassium, LCS	2460	2500	MG/KG	98.2
		Magnesium, LCS	2490	2500	MG/KG	99.6
		Manganese, LCS	76.2	75.0	MG/KG	101.6
		Molybdenum, LCS	508	500	MG/KG	101.6
		Sodium, LCS	2430	2500	MG/KG	97.4
		Nickel, LCS	200	200	MG/KG	99.8
		Lead, LCS	250	250	MG/KG	100.2
		Antimony, LCS	297	300	MG/KG	99.0
		Selenium, LCS	929	1000	MG/KG	92.9
		Silicon, LCS	446	500	MG/KG	89.1
		Vanadium, LCS	244	250	MG/KG	97.7
		Zinc, LCS	99.3	100	MG/KG	99.3
LCS1	05C0095-LC1	Mercury, LCS	6.9	6.2	MG/KG	111.9

000028

Date: 15 July 2005  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: 182-F Remaining Sites - Soil Full Protocol  
Subject: Wet Chemistry - Data Package No. H3142-LLI

## **INTRODUCTION**

This memo presents the results of data validation on Data Package No. H3142-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	Waste Site	Analysis
J03342	4/29/05	Soil	C	182-F	See note 1
J03343	4/29/05	Soil	C	182-F	See note 1
J03344	4/29/05	Soil	C	182-F	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

000001

flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

**Laboratory Duplicate Samples**

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

All laboratory duplicate results were acceptable.

**Field Duplicate**

No field duplicate samples were submitted for analysis.

- **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 No. H3142-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**

FHI, Contract #20266, *Validation Statement of Work*, Bechtel 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**

000005

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).

000006

**Appendix 2**  
**Summary of Data Qualification**

**000007**

WET CHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: H3142	REVIEWER: TLI	PROJECT: 182-F	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.

**Appendix 3**

**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

<b>Project: BECHTEL-HANFORD</b>			
<b>Laboratory: LLI</b>			
<b>Case</b>	<b>SDG: H3142</b>		
<b>Sample Number</b>	J03342	J03343	J03344
<b>Remarks</b>			
<b>Sample Date</b>	4/29/05	4/29/05	4/29/05
<b>Wet Chemistry</b>	<b>RQL</b>	<b>Result</b>	<b>Q</b>
<b>Chromium VI</b>	0.5	0.24	0.34
		0.28	

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/09/05

CLIENT: TNU-HANFORD B05-014

LVL LOT #: 0504L362

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03342	% Solids Chromium VI	96.7 0.24	% MG/KG	0.01 0.21	1.0 1.0
-002	J03343	% Solids Chromium VI	94.7 0.28	% MG/KG	0.01 0.21	1.0 1.0
-003	J03344	% Solids Chromium VI	95.2 0.34	% MG/KG	0.01 0.21	1.0 1.0

*W*  
*7/14/05*

000011

**Appendix 4**  
**Laboratory Narrative and Chain-of-Custody Documentation**

**000012**



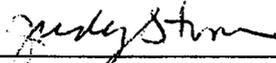
## Analytical Report

**Client:** TNU-HANFORD B05-014 H3142  
**LVL#:** 0504L362

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 04-30-05

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
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 Percent Solids was within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the 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

5/13/02  
Date

npj04-362

000013

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.

05042562

**Bechtel Hanford Inc.**  
 Collector: Doug Bowers/Jim Kicsler  
 Project Designation: 182-F Remaining Sites - Soil Full Protocol  
 Ice Chest No. ERC-03-016  
 Shipped To: EBERLINE SERVICES ALIONVILLE  
 POSSIBLE SAMPLE HAZARDS/REMARKS

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 Company Contact: Doug Bowers  
 Telephone No.: 531-0701  
 Sampling Location: 182-F at 100 F area  
 Field Logbook No.: EL-1590  
 Offsite Priority No.: A050207  
 Project Coordinator: KESSNER, JH  
 SAF No.: B05-014  
 Method of Shipment: Fed Ex  
 Bill of Lading/Air Bill No.: See O5PC

Sample No.	Matrix *	Sample Date	Sample Time	Preservation				Cool-4C	Cool-4C	None	None	None	None
				Type of Container	No. of Container(s)	Volume	See item (1) in Special Instructions.						
J03342	SOIL	4-29-07	0945	aG B	1	250mL	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	500mL	aG C	aG	None
J03343	SOIL		1000	1									
J03344	SOIL		1015	1									

**SPECIAL INSTRUCTIONS**  
 (1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)  
 (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable);

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Received By/Stored In	Date/Time
Handwritten Signature	Handwritten Signature	4/29/07 1230
Handwritten Signature	Handwritten Signature	4-30-07 1000
Relinquished By/Removed From	Received By/Stored In	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time

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

000014

**Appendix 5**  
**Data Validation Supporting Documentation**

**000015**

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**000016**

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	182-F 100 Acres		DATA PACKAGE: H3142		
VALIDATOR:	LAB: LLI		DATE: 7/14/03		
			SDG: H3142		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	<b>Chromium-VI</b>	pH	NO <sub>3</sub> /NO <sub>2</sub>
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J03342 J03343 J03344					
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 PB

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 PAS

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST**

**7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Appendix 6**  
**Additional Documentation Requested by Client**

**000021**

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/09/05

CLIENT: TNU-HANFORD B05-014  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L362

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI034-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

000022

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/09/05

CLIENT: TNU-HANFORD B05-014  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L362

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J03342	Soluble Chromium VI	4.2	0.24	4.1	95.0	1.0
		Insoluble Chromium VI	1290	0.24	1050	123.0	100
BLANK10	05LVI034-MB1	Soluble Chromium VI	3.9	0.20u	4.0	98.4	1.0
		Insoluble Chromium VI	1310	0.20u	1120	117.3	100

000023

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/09/05

CLIENT: TNU-HANFORD B05-014  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0504L362

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD		DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----	-----
-001REP	J03342	Chromium VI	0.24	0.35	34.9	1.0
-003REP	J03344	* Solids	95.2	95.6	0.43	1.0

000024

Date: 15 July 2005  
To: Bechtel Hanford Inc. (technical representative)  
From: TechLaw, Inc.  
Project: 182-F Remaining Sites - Soil Full Protocol  
Subject: PCB - Data Package No. H3142-LLI (SDG No. H3142)

## INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H3142-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Waste Site	Analysis
J03342	4/29/05	Soil	C	182-F	See note 1
J03343	4/29/05	Soil	C	182-F	See note 1
J03344	4/29/05	Soil	C	182-F	See note 1

1- PCBs by 8082

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

## DATA QUALITY OBJECTIVES

- **Holding Times**

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

000001

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

All holding times were acceptable.

- **Method Blank**

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

All method blank target compound results were acceptable.

#### Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

#### Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150% (laboratory CLP limits for chlorinated pesticides). If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to a matrix spike recovery outside QC limits (59%), all PCB results (except aroclor-1260) were qualified as estimates and flagged "J".

000002

All other accuracy spike results were acceptable.

#### Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

#### Matrix Spike/Matrix Spike Duplicate Samples

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

All matrix spike/matrix spike duplicate results were acceptable.

#### Field Duplicate Samples

No field duplicates were submitted for analysis.

- **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 undetected PCB results in sample J03344 exceeded the RQL. Under the BHI statement of work, no qualification is required. All other analytes met the RQL.

000003

- **Completeness**

Data Package No. H3142-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 a matrix spike recovery outside QC limits (59%), all PCB results (except aroclor-1260) were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected PCB results in sample J03344 exceeded the RQL. Under the BHI statement of work, no qualification is required.

### **REFERENCES**

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

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

**Appendix 1**  
**Glossary of Data Reporting Qualifiers**

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

**Appendix 2**  
**Summary of Data Qualification**

000007

PCB DATA QUALIFICATION SUMMARY\*

SDG: H3142	REVIEWER: TLI	PROJECT: 182-F	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All except aroclor-1260	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.

**Appendix 3**  
**Qualified Data Summary and Annotated Laboratory Reports**

**000009**

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD		J03343	J03344
Laboratory: Lionville Laboratory Inc.			
Case:	SDG: H3142		
Sample Number	J03342		
Remarks			
Sample Date	4/29/05	4/29/05	4/29/05
Extraction Date	5/3/06	5/3/06	5/3/06
Analysis Date	5/6/05	5/6/05	5/6/05
PCB	RQL	Result	Q
Aroclor-1016	20	14 UJ	140 UJ
Aroclor-1221	20	14 UJ	140 UJ
Aroclor-1232	20	14 UJ	140 UJ
Aroclor-1242	20	14 UJ	140 UJ
Aroclor-1248	20	14 UJ	140 UJ
Aroclor-1254	20	14 UJ	36 J
Aroclor-1260	20	15	140 U

000010

Cust ID: J03342 J03342 J03342 J03342 J03344 PBLKXH

Sample Information: RFW#: 001 Matrix: SOIL D.F.: 1.00 Units: UG/KG

Table with 10 columns: Surrogate, RFW#, Matrix, D.F., Units, and 5 detection columns (84%, 90%, 14U, 14U, 14U, etc.). Includes handwritten arrows pointing to specific rows.

Cust ID: PBLKXH BS

Sample Information: RFW#: 05LE0345-MB1 Matrix: SOIL D.F.: 1.00 Units: UG/KG

Table with 10 columns: Surrogate, RFW#, Matrix, D.F., Units, and 5 detection columns (87%, 96%, 77%, etc.). Includes handwritten notes '2/15/05' and 'NS= Not Spiked'.

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

**Appendix 4**

**Laboratory Narrative and Chain-of-Custody Documentation**

**C00012**



Case Narrative

Client: TNU-HANFORD B05-014  
LVL #: 0504L362  
SDG/SAF # H3142/B05-014

W.O. #: 11343-606-001-9999-00  
Date Received: 04-30-2005

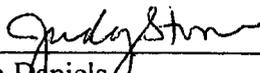
PCB

Three (3) soil samples were collected on 04-29-2005.

The samples and their associated QC samples were extracted on 05-03-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 05-06-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LVL's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur, Sulfuric Acid and Silica Gel cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A, 3665A, and 3630C respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. One (1) of four (4) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR #05GC174) has been enclosed.
8. Sample 003 required a 10-fold instrument dilution due to high concentrations of target analytes.
9. The initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of CCV analyzed on 05-06-05 @ 08:56 AM on the RTX-CLP column. A copy of the Sample Discrepancy Report (SDR #05GC174) has been enclosed.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

5/23/05  
Date

kdsr:\group\data\pest\tnu hanford\0504-362.pcb

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 **000013** pages.



# LIONVILLE LABORATORY Sample Discrepancy Report (SDR)

SDR #: 080174

Initiator: M. McNeill  
 Date: 5/16/05  
 Client: TRW Hanford

Batch: 05041362  
 Samples: ALL  
 Method: SW846/MCAWW/CLPI

Parameter: OPCS  
 Matrix: Soil  
 Prep Batch: 07E0345

## 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)

- 1 - CCU limit on ATX-CCP, USE ATX-CCP2 FOR QUANTITATION OF ALL METALS
- 2 - MS Recovery for 106 was low @ 59% (mark: 60-100). MIN AND MS WERE OK. NO HTS FOR 106.
- 3 - PREP BATCH 23 SAMPLES

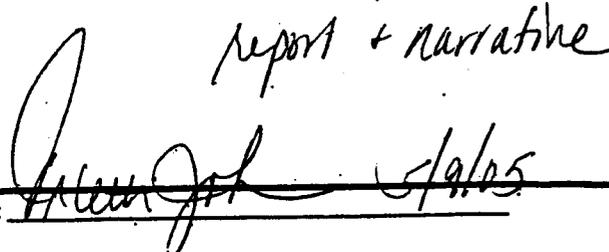
## 2. Known or Probable Causes(s)

3. When the batch size was noticed, INSUFFICIENT SKEW WERE TO SEE AN ADDITIONAL BLANK + BLANKS PILE.

## 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)

*report + narrative*  


## 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

## 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

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
<input type="checkbox"/>	X Initiator	<input type="checkbox"/>	Metals: Beegle
<input type="checkbox"/>	X Lab General Manager, M. Taylor	<input type="checkbox"/>	Inorganic: Perrone
<input checked="" type="checkbox"/>	X Project Mgr. Stone/Johnson/Haslett	<input type="checkbox"/>	GC/LC: Kiger
<input type="checkbox"/>	X Technical Mgr. Wesson/Daniels	<input type="checkbox"/>	MS: Rychlak/Layman
<input type="checkbox"/>	X QA (file): Alberts	<input type="checkbox"/>	Log-in: Melnic
<input type="checkbox"/>	Data Management: Feldman	<input type="checkbox"/>	Admin: Soos
<input type="checkbox"/>	Sample Prep: Beegle/Kiger	<input type="checkbox"/>	Other: _____

000015

**Appendix 5**

**Data Validation Supporting Documentation**

**000016**

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<b>C</b>	D	E
PROJECT:	182-F <del>100 area</del>		DATA PACKAGE: H3142		
VALIDATOR:	TLE	LAB:	LLI	DATE: 7/14/05	
			SDG:	H3142	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	<b>SW-846 8082</b>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J03342		J03343	J03344		
soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

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

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

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

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

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

Comments: \_\_\_\_\_  
 \_\_\_\_\_

PCB DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A  
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A  
Laboratory blanks analyzed? ..... Yes No N/A  
Laboratory blank results acceptable? ..... Yes No N/A  
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A  
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A  
Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Surrogates analyzed? ..... Yes No N/A  
Surrogate recoveries acceptable? ..... Yes No N/A  
Surrogates traceable? (Levels D, E) ..... Yes No N/A  
Surrogates expired? (Levels D, E) ..... Yes No N/A  
MS/MSD samples analyzed? ..... Yes No N/A  
MS/MSD results acceptable? ..... Yes No N/A  
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A  
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A  
LCS/BSS samples analyzed? ..... Yes No N/A  
LCS/BSS results acceptable? ..... Yes No N/A  
Standards traceable? (Levels D, E) ..... Yes No N/A  
Standards expired? (Levels D, E) ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A  
Performance audit sample(s) analyzed? ..... Yes No N/A  
Performance audit sample results acceptable? ..... Yes No N/A

Comments: Caractor 1016- 5970 J all except 1260

no P45

**PCB DATA VALIDATION CHECKLIST**

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

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**6. SYSTEM PERFORMANCE (Levels D and E)**

- Chromatographic performance acceptable? ..... Yes No  N/A
- Positive results resolved acceptably? ..... Yes No  N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**7. HOLDING TIMES (all levels)**

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

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A  
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A  
Results reported for all requested analyses? ..... Yes No N/A  
Results supported in the raw data? (Levels D, E) ..... Yes No N/A  
Samples properly prepared? (Levels D, E) ..... Yes No N/A  
Detection limits meet RDL? ..... Yes No N/A  
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A  
Comments: all undetects are in 344

9. SAMPLE CLEANUP (Levels D and E)

Fluoracil ® (or other absorbent) cleanup performed? ..... Yes No N/A  
Lot check performed? ..... Yes No N/A  
Check recoveries acceptable? ..... Yes No N/A  
GPC cleanup performed? ..... Yes No N/A  
GPC check performed? ..... Yes No N/A  
GPC check recoveries acceptable? ..... Yes No N/A  
GPC calibration performed? ..... Yes No N/A  
GPC calibration check performed? ..... Yes No N/A  
GPC calibration check retention times acceptable? ..... Yes No N/A  
Check/calibration materials traceable? ..... Yes No N/A  
Check/calibration materials Expired? ..... Yes No N/A  
Analytical batch QC given similar cleanup? ..... Yes No N/A  
Transcription/Calculation Errors? ..... Yes No N/A  
Comments: \_\_\_\_\_