

SAF-B01-054
100 B/C Area Effluent Pipeline & Proximity Site
Remediation Activities - Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jill Thomson	H9-01	<u>BT 5/15</u> INITIAL/DATE
Jeanette Duncan	H9-02	<u>BT 5/15</u> INITIAL/DATE

SDG: H2138 SAF-B01-054

Waste Site/Sample Location: 1607-B11

RECEIVED
JUL 14 2003
EDMC

Date: 29 April 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol - Waste Site 1607-B11
Subject: Radiochemistry - Data Package No. H2138-EB (SDG No. H2138)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2138-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KW4	4/2/03	Soil	C	See note 1
J00KV9	4/2/03	Soil	C	See note 1
J00KW0	4/2/03	Soil	C	See note 1
J00KW1	4/2/03	Soil	C	See note 1
J00KW2	4/2/03	Soil	C	See note 1
J00KW3	4/2/03	Soil	C	See note 1

1- Gamma spectroscopy, gross alpha & beta.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

000001

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KW4) was submitted for analysis. Potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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 either 70-130% or ± 3 sigma. 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. 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% or ± 3 sigma.

000002

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% (35% for gross alpha and gross beta), 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 Duplicate

One set of field duplicate samples (J00KW2/J00KW3) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. Thirty-one analytes were reported above their TDL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

Data package No. H2138 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.

000003

MINOR DEFICIENCIES

Thirty-one analytes were reported above their TDL. 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.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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.

000006

Appendix 2
Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H2138	REVIEWER: TLI	DATE: 4/29/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD											
Laboratory: EB											
Case	SDG: H2138										
Sample Number	J00KW4	J00KW9	J00KW0	J00KW1	J00KW2	J00KW3					
Remarks	E. Blank										
Location	1607-B11	1607-B11	1607-B11	1607-B11	1607-B11	1607-B11					
Sample Date	4/2/03	4/2/03	4/2/03	4/2/03	4/2/03	4/2/03					
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		2.09 U	5.55 U	5.60	3.40 U	5.24 U	7.99 U				
Gross beta		5.06 U	18.5	19.8	22.6	22.6	15.8 U				
Potassium-40		2.98	9.81	8.93	8.88	8.85	8.11				
Cobalt 60	0.05	U U	U U*	U U*	U U*	U U*	U U*				
Cesium 137	0.05	U* U	U U*	U U*	U U*	U U*	U U*				
Radium-226		0.128	0.432	0.354	0.374	0.345	0.341				
Radium-228		0.252	0.576	0.501	0.517	0.715	0.488				
Europium 152	0.1	U U	U U*	U U*	U U*	U U*	U U*				
Europium 154	0.1	U U	U U*	U U*	U U*	U U*	U U*				
Europium 155	0.1	U U	U U*	U U*	U U*	U U*	U U*				
Thorium-228		0.140	0.504	0.395	0.391	0.480	0.443				
Thorium-232		0.252	0.576	0.501	0.517	0.715	0.488				
Uranium-235	1	U U	U U	U U	U U	U U	U U				
Uranium-238	1	U U*	U U*								
Americium-241	1	U U	U U	U U	U U	U U	U U				

000010

* - TDL 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 H2138

7478-001

J00KV9

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	<u>SDG H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-01</u>	Client sample id <u>J00KV9</u>	
Dept sample id <u>7478-001</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 10:17 938.3 g</u>	
% solids <u>93.9</u>	Custody/SAF No <u>B01-054-023</u>	<u>B01-054</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	5.55	3.7	3.7	10		93A
Gross Beta	12587-47-2	18.5	4.3	5.4	15		93B
Potassium 40	13966-00-2	9.81	3.0	0.82			GAM
Cobalt 60	10198-40-0	U		<u>0.10</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.093	0.10	U	GAM
Radium 226	13982-63-3	0.432	0.18	0.16			GAM
Radium 228	15262-20-1	0.576	0.32	0.34			GAM
Europium 152	14683-23-9	U		<u>0.21</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>0.16</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.504	0.13	0.14			GAM
Thorium 232	TH-232	0.576	0.32	0.34			GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		9.9		U	GAM
Americium 241	14596-10-2	U		0.084		U	GAM

100 B/C Area Effluent Pipe. & Prox.

Handwritten signature
4/29/03

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>04/11/03</u>

000011

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-002

J00KW0

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	SDG <u>H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-02</u>	Client sample id <u>J00KW0</u>	
Dept sample id <u>7478-002</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 10:31 994.9 g</u>	
% solids <u>96.2</u>	Custody/SAF No <u>B01-054-023 B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	5.60	4.2	5.4	10		93A
Gross Beta	12587-47-2	19.8	5.8	8.3	15		93B
Potassium 40	13966-00-2	8.93	2.5	0.77			GAM
Cobalt 60	10198-40-0	U		<u>0.081</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.069</u>	0.10	U	GAM
Radium 226	13982-63-3	0.354	0.19	0.13			GAM
Radium 228	15262-20-1	0.501	0.29	0.28			GAM
Europium 152	14683-23-9	U		<u>0.16</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.22</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.19</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.395	0.12	0.12			GAM
Thorium 232	TH-232	0.501	0.29	0.28			GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		8.0		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RW
4/29/03

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>04/11/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-003

J00KW1

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	SDG <u>H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-03</u>	Client sample id <u>J00KW1</u>	
Dept sample id <u>7478-003</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 10:46 932.2 g</u>	
% solids <u>96.2</u>	Custody/SAF No <u>B01-054-023 B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	3.40	3.8	5.0	10	U	93A
Gross Beta	12587-47-2	22.6	5.2	6.8	15		93B
Potassium 40	13966-00-2	8.88	1.3	0.66			GAM
Cobalt 60	10198-40-0	U		<u>0.077</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.073</u>	0.10	U	GAM
Radium 226	13982-63-3	0.374	0.14	0.15			GAM
Radium 228	15262-20-1	0.517	0.31	0.31			GAM
Europium 152	14683-23-9	U		<u>0.16</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.23</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.19</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.391	0.10	0.12			GAM
Thorium 232	TH-232	0.517	0.31	0.31			GAM
Uranium 235	15117-96-1	U		0.27		U	GAM
Uranium 238	U-238	U		8.8		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM

100 B/C Area Effluent Pipe. & Prox.

Rh
4/29/03

DATA SHEETS

Page 3

SUMMARY DATA SECTION

Page 13

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>04/11/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-004

J00KW2

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	SDG <u>H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-04</u>	Client sample id <u>J00KW2</u>	
Dept sample id <u>7478-004</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 11:04 858.5 g</u>	
% solids <u>95.2</u>	Custody/SAF No <u>B01-054-023 B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	5.24	4.3	5.9	10	U	93A
Gross Beta	12587-47-2	22.6	5.1	6.7	15		93B
Potassium 40	13966-00-2	8.85	1.0	0.40			GAM
Cobalt 60	10198-40-0	U		<u>0.062</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.060	0.10	U	GAM
Radium 226	13982-63-3	0.345	0.093	0.089			GAM
Radium 228	15262-20-1	0.715	0.27	0.24			GAM
Europium 152	14683-23-9	U		<u>0.14</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.23</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.13</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.480	0.062	0.064			GAM
Thorium 232	TH-232	0.715	0.27	0.24			GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		7.4		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

100 B/C Area Effluent Pipe. & Prox.

R/M
4/29/03

000014

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>04/11/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-005

J00KW3

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	SDG <u>H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-05</u>	Client sample id <u>J00KW3</u>	
Dept sample id <u>7478-005</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 11:04 900.0 g</u>	
% solids <u>95.8</u>	Custody/SAF No <u>B01-054-023 B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	7.99	4.4	5.1	10		93A
Gross Beta	12587-47-2	15.8	5.6	8.2	15		93B
Potassium 40	13966-00-2	8.11	1.1	0.61			GAM
Cobalt 60	10198-40-0	U		<u>0.060</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.059	0.10	U	GAM
Radium 226	13982-63-3	0.341	0.11	0.11			GAM
Radium 228	15262-20-1	0.488	0.26	0.24			GAM
Europium 152	14683-23-9	U		<u>0.15</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.21</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.15</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.443	0.060	0.063			GAM
Thorium 232	TH-232	0.488	0.26	0.24			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		7.0		U	GAM
Americium 241	14596-10-2	U		0.30		U	GAM

100 B/C Area Effluent Pipe. & Prox.

pkc
4/29/03

000015

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>04/11/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-006

J00KW4

DATA SHEET

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	SDG <u>H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-06</u>	Client sample id <u>J00KW4</u>	
Dept sample id <u>7478-006</u>	Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u>	
Received <u>04/04/03</u>	Collected/Weight <u>04/02/03 10:02 729.4 g</u>	
% solids <u>100.0</u>	Custody/SAF No <u>B01-054-023 B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	2.09	2.2	2.8	10	U	93A
Gross Beta	12587-47-2	5.06	3.4	5.3	15	U	93B
Potassium 40	13966-00-2	2.98	0.46	0.50			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.027	0.10	U	GAM
Radium 226	13982-63-3	0.129	0.052	0.053			GAM
Radium 228	15262-20-1	0.252	0.15	0.14			GAM
Europium 152	14683-23-9	U		0.069	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.067	0.10	U	GAM
Thorium 228	14274-82-9	0.140	0.040	0.045			GAM
Thorium 232	TH-232	0.252	0.15	0.14			GAM
Uranium 235	15117-96-1	U		0.092		U	GAM
Uranium 238	U-238	U		3.9		U	GAM
Americium 241	14596-10-2	U		0.067		U	GAM

100 B/C Area Effluent Pipe. & Prox.

JRM
4/29/03

000016

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>04/11/03</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000017

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2138 was composed of six solid (soil) samples designated under SAF No. B01-054 with a Project Designation of: 100 B/C Area Effluent Pipeline & Proximity Site Remediation, 1607-B-11 Septic System.

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-Fax on April 11, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on April 11, 2003.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy Analyses

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
Melissa C. Mannion
Program Manager

4/14/3
Date

Bechtel Hanford Inc. **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B01-054-023** Page 1 of 2

Collector: D. Shea Telephone No. 521-6014 Project Coordinator: KESSNER, JH Price Code: 8L Data Turnaround: 7-21 Days

Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediation Sampling Location: H2138 (747P) Air Quality: 4/2/03

Ice Chest No.: ERC 99 043 Field Logbook No.: COA R607BB2F00 Method of Shipment: FED EX

Shipped To: TMA/RECA Offsite Property No.: A030191 Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000019

SAMPLE ANALYSIS

| Sample No. | Matrix * | Sample Date | Sample Time | See Item (1) in Special Instructions | Cool 4C | Preservation |
|------------|----------|-------------|-------------|--|---------|---------|---------|---------|---------|---------|---------|---------|--------------|
| J00KV9 | SOIL | 4/2/03 | 1017 | ICP Metals - 6010A (Add-on) (Chromium, Lead, Mercury, 7471 - (CV)) | G/P | 120mL |
| J00KW0 | SOIL | | 1031 | Chromium Hex - 7196 | G/P | 60mL |
| J00KW1 | SOIL | | 1046 | Chromium Hex - 7196 | G/P | 60mL |
| J00KW2 | SOIL | | 1104 | Chromium Hex - 7196 | G/P | 60mL |
| J00KW3 | SOIL | | 1104 | Chromium Hex - 7196 | G/P | 60mL |

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Masha Poshko	4/2/03 1652	Fridy 3B	4/2/03 1652
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF 3B 4303 0900	0900	SJ OATH/MSH	4303 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
STAT/MSH	4303 0900	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX		MSH (N)	4403 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)

(2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Silver-106, Uranium-238)

Personnel not available to relinquish samples from the 3728 Ref # 5B on 4/3/02

Matrix *
 S=Soil
 SE=Soilment
 SO=Solid
 SP=Sludge
 W = Water
 G=Oil
 A=Air
 DS=Drum Solid
 DL=Drum Liquid
 T=Thane
 W=Wipe
 L=Liquid
 V=Vegetation
 X=Other

LABORATORY SECTION Received By: Title: Date/Time

FINAL SAMPLE DISPOSITION Disposal Method: Disposed By: Date/Time

Bechtel Hanford Inc. Page 2 of 2

Collector: D. Shea B01-054-023

Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediation Price Code: 8L

Ice Chest No.: ERC 99 043 Air Quality:

Shipping To: TMA/RECA Method of Shipment: **FED EX**

Company Contact: D. Shea Project Coordinator: KESSNER, JH

Sampling Location: 100 BC, 1607-B-11 Septic system SAF No.: B01-054

Field Logbook No.: EL-1573 COA: R607BB2F00

Offsite Property No.: A030191 Bill of Lading/Air Bill No.: **SEE OSPC**

Telephone No.: 521-6014 Data Turnaround: 7 ~~21~~ Days

H2138 (7478)

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None
J00KW4	SOIL	4/2/03	1002		G/P	G/P	G/P	aG	aG	aG	60mL	500mL	60mL
000020					120mL	120mL	250g	120g	60mL	60mL	60mL	500mL	60mL
					See Item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead, Mercury - 7471 - 66V)	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D. Shea	4/2/03 1652	Fridge 3B	4/2/03 1652
R. F. OB	4/30/03 0900	536ALC/101	4/30/03 0900
S. GALC/101	4/30/03 0900	Fridge EX	4/30/03 0900
F. OB	4/30/03 0900	Received By/Stored In	4/30/03 1000
		Received By/Stored In	
		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
 (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Silver-106, mersorbite, Uranium-238)

Matrix *

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

Personnel not available to relinquish samples from the 3728 Ref # 3B on 4/3/03

LABORATORY SECTION Received By: _____ Title: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

Disposed By: _____ Date/Time: _____

Appendix 5

Data Validation Supporting Documentation

000021

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	1005C 1607-B11		DATA PACKAGE: H2138		
VALIDATOR:	TL1	LAB: ED ED	DATE: 4/28/09		
CASE:	SDG: H2138				
ANALYSES PERFORMED					
<u>Gross Alpha/Beta</u>	Strontium-90	Technetium-99	Alpha Spectroscopy	<u>Gamma Spectroscopy</u>	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J00KW4 J00KV9 J00KW0 J00KW1					
J00KW2 J00KW3					
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

Appendix A – Radiochemical Data Validation Checklist

BHI-01433

Rev. 0

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: _____

000023

Appendix A – Radiochemical Data Validation Checklist

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: K-40 Re 226/228 + th 228/232 in EB

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

Appendix A – Radiochemical Data Validation Checklist

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: _____

Appendix A – Radiochemical Data Validation Checklist

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

Duplicates Analyzed at required frequency? Yes No N/A

RPD Values Acceptable? Yes No N/A

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

Comments: _____

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: NO FS or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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: 31 ~~2~~ over TDL

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-008

Method Blank

METHOD BLANK

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	<u>SDG H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7478-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B01-054</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.519	1.3	2.9	10	U	93A
Gross Beta	12587-47-2	1.14	3.9	6.4	15	U	93B
Potassium 40	13966-00-2	U		1.7		U	GAM
Cobalt 60	10198-40-0	U		<u>0.080</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.053	0.10	U	GAM
Radium 226	13982-63-3	U		0.12		U	GAM
Radium 228	15262-20-1	U		0.27		U	GAM
Europium 152	14683-23-9	U		<u>0.15</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.18</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		0.079		U	GAM
Thorium 232	TH-232	U		0.27		U	GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		6.4		U	GAM
Americium 241	14596-10-2	U		0.22		U	GAM

100 B/C Area Effluent Pipe. & Prox.

QC-BLANK 44305

000029

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>04/11/03</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-007

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7478</u>	Client/Case no <u>Hanford</u>	<u>SDG H2138</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R304031-07</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7478-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B01-054</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	210	15	3.5	10	93A	200	8.0	105	66-134	70-130
Gross Beta	206	11	7.9	15	93B	211	8.4	98	76-124	70-130
Cobalt 60	4.65	0.20	<u>0.072</u>	0.050	GAM	4.86	0.19	96	77-123	80-120
Cesium 137	4.66	0.17	<u>0.11</u>	0.10	GAM	4.68	0.19	100	76-124	80-120

100 B/C Area Effluent Pipe. & Prox.

QC-LCS 44304

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>04/11/03</u>

000030

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2138

7478-009

J00KW3

DUPLICATE

<p>SDG <u>7478</u></p> <p>Contact <u>Melissa C. Mannion</u></p> <p align="center">DUPLICATE</p> <p>Lab sample id <u>R304031-09</u></p> <p>Dept sample id <u>7478-009</u></p> <p>% solids <u>95.8</u></p>	<p align="center">ORIGINAL</p> <p>Lab sample id <u>R304031-05</u></p> <p>Dept sample id <u>7478-005</u></p> <p>Received <u>04/04/03</u></p> <p>% solids <u>95.8</u></p>	<p>Client/Case no <u>Hanford</u> <u>SDG H2138</u></p> <p>Contract No. <u>630</u></p> <p>Client sample id <u>J00KW3</u></p> <p>Location/Matrix <u>100 BC, 1607-B-11 Septic SOLID</u></p> <p>Collected/Weight <u>04/02/03 11:04 900.0 g</u></p> <p>Custody/SAF No <u>B01-054-023</u> <u>B01-054</u></p>
---	--	---

ANALYTE	DUPLICATE		MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Gross Alpha	5.85	3.9	4.0	10		93A	7.99	4.4	5.1		31	134	
Gross Beta	15.6	4.3	5.8	15		93B	15.8	5.6	8.2		1	75	
Potassium 40	8.51	0.95	0.49			GAM	8.11	1.1	0.61		5	41	
Cobalt 60	U		<u>0.063</u>	0.050	U	GAM	U		<u>0.060</u>	U	-	-	
Cesium 137	U		0.049	0.10	U	GAM	U		0.059	U	-	-	
Radium 226	0.382	0.070	0.061			GAM	0.341	0.11	0.11		11	63	
Radium 228	0.751	0.22	0.19			GAM	0.488	0.26	0.24		42	89	
Europium 152	U		<u>0.13</u>	0.10	U	GAM	U		<u>0.15</u>	U	-	-	
Europium 154	U		<u>0.18</u>	0.10	U	GAM	U		<u>0.21</u>	U	-	-	
Europium 155	U		<u>0.12</u>	0.10	U	GAM	U		<u>0.15</u>	U	-	-	
Thorium 228	0.480	0.058	0.052			GAM	0.443	0.060	0.063		8	42	
Thorium 232	0.751	0.22	0.19			GAM	0.488	0.26	0.24		42	89	
Uranium 235	U		0.16		U	GAM	U		0.24	U	-	-	
Uranium 238	U		6.4		U	GAM	U		7.0	U	-	-	
Americium 241	U		0.12		U	GAM	U		0.30	U	-	-	

100 B/C Area Effluent Pipe. & Prox.

QC-DUP#5 44306

000031

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>04/11/03</u>

Date: 29 April 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities -
Full Protocol - Waste Site 1607-B11
Subject: PCB/Pesticide - Data Package No. H2138-LLI (SDG No. H2138)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2138-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	Analysis
J00KW4	4/2/03	Soil	C	See note 1
J00KV9	4/2/03	Soil	C	See note 1
J00KW0	4/2/03	Soil	C	See note 1
J00KW1	4/2/03	Soil	C	See note 1
J00KW2	4/2/03	Soil	C	See note 1
J00KW3	4/2/03	Soil	C	See note 1

1 - PCBs by 8082; pesticides by 8081A.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

000001

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than target detection limit (TDL). 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 TDL, the result is qualified as undetected and elevated to the TDL.

All method blank target compound results were acceptable.

Field Blanks

One equipment blank (J00KW4) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike

Matrix spike 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 analyses are performed in duplicate and must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix 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

000003

One set of field duplicate samples (J00KW2/J00KW3) were submitted for analysis. Field duplicate results 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 Target Detection Limits TDLs to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the TDL except alpha-chlordane and gamma-chlordane in all samples and nine additional analytes in sample J00KW4. Under the BHI statement of work, no qualification is required.

- **Completeness**

Reported analytical detection levels are compared against the Required Detection Limits RDLs to ensure that laboratory detection levels meet the required criteria. All PCB, methoxychlor and toxaphene results exceeded the RDL. Under the BHI statement of work, no qualification is required.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All PCB, methoxychlor and toxaphene results exceeded the RDL. 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.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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

DATA QUALIFICATION SUMMARY

SDG: H2138	REVIEWER: TLI	DATE: 4/29/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD		J00KW4		J00KW9		J00KW0		J00KW1		J00KW2		J00KW3	
Laboratory: Lionville Laboratory Inc.		E. Blank		4/2/03		4/2/03		4/2/03		4/2/03		Duplicate	
Case: SDG: H2138		4/7/03		4/7/03		4/7/03		4/7/03		4/7/03		4/7/03	
Sample Number		4/9/03		4/9/03		4/10/03		4/10/03		4/9/03		4/9/03	
Remarks		Result		Q		Result		Q		Result		Q	
Sample Date		16.5		33 U		35 U		34 U		35 U		35 U	
Extraction Date		16.5		67 U		70 U		69 U		70 U		70 U	
Analysis Date		16.5		33 U		35 U		34 U		35 U		35 U	
PCB		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1016		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1221		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1232		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1242		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1248		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1254		16.5		33 U		35 U		34 U		35 U		35 U	
Aroclor-1260		16.5		33 U		35 U		34 U		35 U		35 U	
Sample Number		J00KW4		J00KV9		J00KW0		J00KW1		J00KW2		J00KW3	
Remarks		E. Blank		4/2/03		4/2/03		4/2/03		4/2/03		Duplicate	
Sample Date		4/7/03		4/7/03		4/7/03		4/7/03		4/7/03		4/7/03	
Extraction Date		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03	
Analysis Date		Result		Q		Result		Q		Result		Q	
Pesticide		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Alpha-BHC		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Beta-BHC		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Delta-BHC		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Gamma-BHC (Lindane)		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Heptachlor		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Aldrin		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Heptachlor Epoxide		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Endosulfan I		5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Dieldrin		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
4,4'-DDE		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
Endrin		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
Endosulfan II		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
4,4'-DDD		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
Endosulfan Sulfate		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
4,4'-DDT		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
Methoxychlor		5		17 U		17 U		17 U		17 U		17 U	
Endrin Ketone		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
Endrin Aldehyde		5		3.3 U		3.5 U		3.4 U		3.5 U		3.5 U	
alpha-Chlordane		16.5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
gamma-Chlordane		16.5		1.7 U		1.7 U		1.7 U		1.7 U		1.7 U	
Toxaphene		5		170 U		170 U		170 U		170 U		170 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.

000010

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J00KW4	J00KW4	J00KW4	J00KV9	J00KW0	J00KW1
		SOIL	1.00	UG/KG	001 MS	001 MSD	002	SOIL	003	004
		SOIL	1.00	UG/KG	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene	90 %	85 %	95 %	95 %	95 %	95 %	95 %	85 %	95 %	95 %
Decachlorobiphenyl	100 %	100 %	105 %	105 %	105 %	90 %	95 %	95 %	105 %	105 %
Aroclor-1016	33 U	95 %	100 %	100 %	35 U	70 U	35 U	35 U	34 U	34 U
Aroclor-1221	67 U	67 U	67 U	67 U	35 U	35 U	35 U	35 U	34 U	34 U
Aroclor-1232	33 U	33 U	33 U	33 U	35 U	35 U	35 U	35 U	34 U	34 U
Aroclor-1242	33 U	33 U	33 U	33 U	35 U	35 U	35 U	35 U	34 U	34 U
Aroclor-1248	33 U	33 U	33 U	33 U	35 U	35 U	35 U	35 U	34 U	34 U
Aroclor-1254	33 U	33 U	33 U	33 U	35 U	35 U	35 U	35 U	34 U	34 U
Aroclor-1260	33 U	99 %	102 %	102 %	35 U	35 U	35 U	35 U	34 U	34 U

000011

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J00KW3	PBLKQC	J00KW3	PBLKQC	PBLKQC BS
		SOIL	1.00	UG/KG	006	03LE0402-MB1	005	03LE0402-MB1	03LE0402-MB1
		SOIL	1.00	UG/KG	SOIL	SOIL	SOIL	SOIL	SOIL
		UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene	95 %	95 %	90 %	90 %	95 %	90 %	90 %	90 %	90 %
Decachlorobiphenyl	95 %	100 %	100 %	105 %	100 %	100 %	105 %	105 %	105 %
Aroclor-1016	35 U	35 U	33 U	33 U	35 U	67 U	33 U	33 U	33 U
Aroclor-1221	70 U	70 U	67 U	67 U	35 U	33 U	33 U	33 U	33 U
Aroclor-1232	35 U	35 U	33 U	33 U	35 U	33 U	33 U	33 U	33 U
Aroclor-1242	35 U	35 U	33 U	33 U	35 U	33 U	33 U	33 U	33 U
Aroclor-1248	35 U	35 U	33 U	33 U	35 U	33 U	33 U	33 U	33 U
Aroclor-1254	35 U	35 U	33 U	33 U	35 U	33 U	33 U	33 U	33 U
Aroclor-1260	35 U	35 U	33 U	33 U	35 U	33 U	33 U	33 U	33 U

Handwritten: 4/29/03

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

Lionville Laboratory, Inc.
Pesticide/PCBs by GC, CLP List

Report Date: 04/09/03 12:26

Client: TNUHANFORD B01-054 H2138 Work Order: 11343606001 Page: 1

RFW Batch Number: 0304L1120

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J00KW4	J00KW4	J00KW4	J00KW4	J00KV9	J00KW0	J00KW1
	001	SOIL	1.00	UG/KG	001 MS	001 MSD	002	003	004		
					SOIL	SOIL	SOIL	SOIL	SOIL		
					UG/KG	UG/KG	UG/KG	UG/KG	UG/KG		

Surrogate:	95 %	115 %	100 %	100 %	100 %	95 %	100 %	100 %	100 %	110 %
Tetrachloro-m-xylene	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Decachlorobiphenyl	105 %	135 * %	100 %	100 %	105 %	95 %	105 %	105 %	115 %	115 %
Alpha-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Beta-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Delta-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)	1.7 U	92 %	84 %	96 %	96 %	1.7 U				
Heptachlor	1.7 U	124 %	96 %	90 %	90 %	1.7 U				
Aldrin	1.7 U	114 %	90 %	1.7 U						
Heptachlor epoxide	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan I	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin	3.3 U	128 * %	96 %	96 %	96 %	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
4,4'-DDE	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
Endrin	3.3 U	153 * %	114 %	114 %	114 %	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
Endosulfan II	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
4,4'-DDD	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
Endosulfan sulfate	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
4,4'-DDT	3.3 U	128 * %	98 %	98 %	98 %	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
Methoxychlor	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U	17 U
Endrin ketone	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
Endrin aldehyde	3.3 U	3.3 U	3.3 U	3.3 U	3.3 U	3.5 U	3.5 U	3.5 U	3.4 U	3.4 U
alpha-Chlordane	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Toxaphene	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U	170 U

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

Handwritten: 4/29/03

Handwritten: 4/29/03

000012

RFW Batch Number: 0304L120

Client: TNUHANFORD B01-054 H2138 Work Order: 11343606001 Page: 2

Cust ID: J00KW2

J00KW3

PBLKQC

PBLKQC BS

Sample Information

RFW#: 005 SOIL 006 SOIL 03LE0402-MB1 SOIL 03LE0402-MB1

Matrix: SOIL SOIL SOIL SOIL

D.F.: 1.00 1.00 1.00 1.00

Units: UG/KG UG/KG UG/KG UG/KG

Surrogate:	105 %	105 %	105 %	100 %	110 %	110 %	100 %	120 %
Tetrachloro-m-xylene	1.7 U							
Decachlorobiphenyl	1.7 U							
Alpha-BHC	1.7 U							
Beta-BHC	1.7 U							
Delta-BHC	1.7 U							
gamma-BHC (Lindane)	1.7 U							
Heptachlor	1.7 U							
Aldrin	1.7 U							
Heptachlor epoxide	1.7 U							
Endosulfan I	1.7 U							
Dieldrin	3.5 U	3.5 U	3.5 U	3.3 U	3.3 U	3.3 U	115 %	115 %
4,4'-DDE	3.5 U	3.5 U	3.5 U	3.3 U				
Endrin	3.5 U	3.5 U	3.5 U	3.3 U	3.3 U	3.3 U	138 *	138 *
Endosulfan II	3.5 U	3.5 U	3.5 U	3.3 U				
4,4'-DDD	3.5 U	3.5 U	3.5 U	3.3 U				
Endosulfan sulfate	3.5 U	3.5 U	3.5 U	3.3 U				
4,4'-DDT	3.5 U	3.5 U	3.5 U	3.3 U	3.3 U	3.3 U	109 %	109 %
Methoxychlor	17 U							
Endrin ketone	3.5 U	3.5 U	3.5 U	3.3 U				
Endrin aldehyde	3.5 U	3.5 U	3.5 U	3.3 U				
alpha-Chlordane	1.7 U							
gamma-Chlordane	1.7 U							
Toxaphene	170 U							

Per
4/29/03

off-11-1/03

000013

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

000014



Analytical Report

Client: TNU-HANFORD B01-054
LVL #: 0304L120
SDG/SAF #: H2138/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-04-03

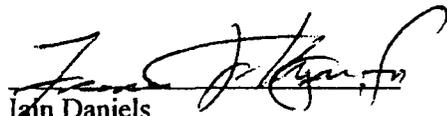
PCB

The set of samples consisted of six (6) soil samples collected on 04-02-03.

The samples and their associated QC samples were extracted on 04-07-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-09,10-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All samples and their associated QC samples received a Sulfuric Acid cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria .
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 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.


Jan Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/14/03
Date

pefr:\group\data\pest\tnu hanford\04L-120.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 11 pages.

000015



Analytical Report

Client: TNU-HANFORD B01-054
LVL #: 0304L120
SDG/SAF #: H2138/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-04-03

PESTICIDE

The set of samples consisted of six (6) soil samples collected on 04-02-03.

The samples and their associated QC samples were extracted on 04-07-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-09-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081A.

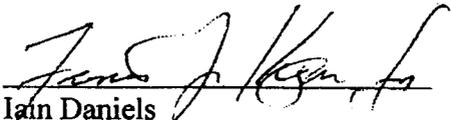
The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. Sample J00KV9 received a Florisil and a Sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of twenty (20) surrogate recoveries was outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. One (1) of six (6) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. Three (3) of twelve (12) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

000016

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

4/11/03
Date

pefr:\group\data\pest\tnu hanford\04L-120.pes



000017



Collector: D. Shea
 Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediation
 Primary Contact: D. Shea
 Telephone No.: 521-6014
 Price Code: 8L
 Date Turnaround: 7-24 Days
 4/2/03
 Air Quality: **FED EX**

Project Coordinator: KESSNER, JH
 SAF No.: B01-054
 Method of Shipment: **FED EX**
 Bill of Lading/Air Bill No.: **SEE ASPC**

Field Logbook No.: EL-1573
 COA: R607B32F00
 Offsite Property No.: **A030177**

SHIPPED TO TMA/RECRA POSSIBLE SAMPLE HAZARDS/REMARKS

SPECIAL HANDLING AND/OR STORAGE

000018

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	None	N-mic					
J00KV9	SOIL	4/2/03	1017		G/P	G/P	120mL	60mL	250g	120g	500mL	None
J00KW0	SOIL		1031		G/P	G/P	120mL	60mL	250g	120g	500mL	None
J00KW1	SOIL		1046		G/P	G/P	120mL	60mL	250g	120g	500mL	None
J00KW2	SOIL		1104		G/P	G/P	120mL	60mL	250g	120g	500mL	None
J00KW3	SOIL		1104		G/P	G/P	120mL	60mL	250g	120g	500mL	None

CHAIN OF POSSESSION

Received By/Removed From	Date/Time	Received By/Stored In	Date/Time
Washed Double	4/2/03 1652	Fridays 3B	4/2/03 1652
Relinquished By/Removed From	4/3/03 0900	SIGNED/DL	4/3/03 0900
Relinquished By/Removed From	4/3/03 0900	FED EX	4/3/03 0900
Relinquished By/Removed From	4/4/03 11005	DL	4/4/03 11005
Relinquished By/Removed From	4/4/03 11005	DL	4/4/03 11005

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
 (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Silver-108, Uranium-238)
 PWS Y11603

Personnel not available to relinquish samples from the 3728 Ref # SB on 4/3/03

LABORATORY SECTION Received By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

Disposed By: _____

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

000020

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	1001x	1607-B11	DATA PACKAGE: H2138		
VALIDATOR:	TLI	LAB: LLI	DATE: 4/29/03		
CASE:			SDG: H2138		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J00kw4 J00kv9 J00kw0 J00kw1					
J00kw2 J00kw3					
Said					

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: _____

PESTICIDE/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: NO PAS

PESTICIDE/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: _____

PESTICIDE/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 over but alpha chlorofluor + gamma chlorofluor
plus 9 additional in W4 S/10/01
methoxychlor + toxapene + all PCBs on
methoxychlor

9. SAMPLE CLEANUP (Levels D and E)

- Fluoricil ® (or other absorbant) cleanup performed? Yes No N/A
- Lot check performed? Yes No N/A
- Check recoveries acceptable? Yes No N/A
- GPC cleanup performed? Yes No N/A
- GPC check performed? Yes No N/A
- GPC check recoveries acceptable? Yes No N/A
- GPC calibration performed? Yes No N/A
- GPC calibration check performed? Yes No N/A
- GPC calibration check retention times acceptable? Yes No N/A
- Check/calibration materials traceable? Yes No N/A
- Check/calibration materials Expired? Yes No N/A
- Analytical batch QC given similar cleanup? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

Date: 29 April 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities -
Full Protocol - Waste Site 1607-B11
Subject: Inorganics - Data Package No. H2138-LLI (SDG No. H2138)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2138-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	Analysis
J00KW4	4/2/03	Soil	C	See note 1
J00KV9	4/2/03	Soil	C	See note 1
J00KW0	4/2/03	Soil	C	See note 1
J00KW1	4/2/03	Soil	C	See note 1
J00KW2	4/2/03	Soil	C	See note 1
J00KW3	4/2/03	Soil	C	See note 1

1 - Chromium VI by 7196A; ICP metals by 6010B; 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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

000001

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, 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KW4) was submitted for analysis. Barium, chromium (total) and lead were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike

Matrix spike (MS) 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 recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike 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 spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All 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

One set of field duplicate samples (J00KW2/J00KW3) were submitted for analysis. Field duplicate results 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 target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. All chromium VI results exceeded the TDL. Under the BHI statement of work, no

qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

Data package No. H2138-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

All chromium VI results exceeded the TDL. 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.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

000004

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

DATA QUALIFICATION SUMMARY

SDG: H2138	REVIEWER: TLI	DATE: 4/29/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/11/03

CLIENT: TNUHANFORD B01-054 H2138
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KW4	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	1.5	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.25	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	0.32	MG/KG	0.25	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
-002	J00KV9	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	5.9	MG/KG	0.36	1.0
		Barium, Total	76.5	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	14.0	MG/KG	0.06	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	10.3	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-003	J00KW0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.6	MG/KG	0.36	1.0
		Barium, Total	52.8	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.7	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	8.0	MG/KG	0.26	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

Handwritten signature
 4/24/07

Handwritten mark

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/11/03

CLIENT: TNUHANFORD B01-054 H2138

LVL LOT #: 0304L120

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J00KW1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.1	MG/KG	0.35	1.0
		Barium, Total	48.6	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	8.2	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	6.3	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-005	J00KW2	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.7	MG/KG	0.37	1.0
		Barium, Total	54.0	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.6	MG/KG	0.06	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	7.6	MG/KG	0.27	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
-006	J00KW3	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.4	MG/KG	0.33	1.0
		Barium, Total	52.9	MG/KG	0.009	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	9.7	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	7.6	MG/KG	0.24	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0

*Per
4/29/03*

000012

9

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2138
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KW4	% Solids Chromium VI	99.9 0.40 u	% MG/KG	0.01 0.40	1.0 1.0
-002	J00KV9	% Solids Chromium VI	95.5 0.42 u	% MG/KG	0.01 0.42	1.0 1.0
-003	J00KW0	% Solids Chromium VI	96.5 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-004	J00KW1	% Solids Chromium VI	97.2 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-005	J00KW2	% Solids Chromium VI	95.6 0.42 u	% MG/KG	0.01 0.42	1.0 1.0
-006	J00KW2	% Solids Chromium VI	95.4 0.42 u	% MG/KG	0.01 0.42	1.0 1.0

pu
 4/29/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



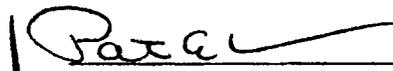
Analytical Report

Client: TNU-HANFORD B01-054 H2138
LVL#: 0304L120

W.O.#: 11343-606-001-9999-00
Date Received: 04-04-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 6 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 analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

04-09-03
Date

njpl04-120

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 13 pages.



Analytical Report

Client: TNU-HANFORD B01-054
LVL#: 0304L120
SDG/SAF#: H2138/B01-054

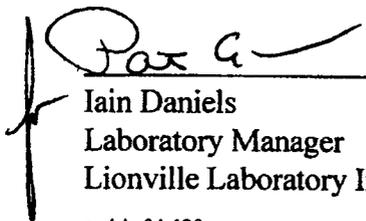
W.O.#: 11343-606-001-9999-00
Date Received: 04-04-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
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), MB value less than 5% of the RCRA limit, 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. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision 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 17 pages.

12. 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.
13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated
gmb/m04-120

04-13-03
Date



Project Coordinator: KESSNER, JH
 Telephone No.: 521-6014
 Price Code: 8L
 Date Turnaround: 7 4/2/03
 Air Quality: 7 4/2/03

Method of Shipment: FED EX
 SAF No.: H01-054
 Bill of Lading/Air Bill No.: SEE OSTR

Company Contact: D. Shea
 Sampling Location: 100 BC, 1607-B-11 Septic system
 Field Logbook No.: EL-1573
 COA: R607BB2F00

Offsite Property No.: A030177
 Possible Sample Hazards/Remarks: NONE

Special Handling and/or Storage

Preservation	Cool 4C	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	40mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions	Gross Alpha, Gross Beta
100KV9	SOIL	4/2/03	1017	ICP Metals - 6010A (Add-on) (Chromium, Lead, Mercury - 7471 (CV))	✓	✓	✓	✓	✓
100KW0	SOIL		1031	✓	✓	✓	✓	✓	✓
100KW1	SOIL		1046	✓	✓	✓	✓	✓	✓
100KW2	SOIL		1104	✓	✓	✓	✓	✓	✓
100KW3	SOIL		1104	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION

Received By/Removed From	Date/Time	Received By/Stored In	Date/Time
Disposal	4/2/03 1652	Fridge 3B	4/2/03 1652
Disposal	4/30/03 0900	SIGNED	4/30/03 0900
Disposal	4/30/03 0900	FED EX	4/30/03 0900
Disposal	4/30/03 1005	Disposal	4/30/03 1005
Disposal	4/30/03 1005	Disposal	4/30/03 1005

SPECIAL INSTRUCTIONS
 (1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver)
 (2) Gamma Spectroscopy (TCL List) (Caesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, ~~Silver-109~~ measurable, Uranium-238)
 DMS 4/16/03

Personnel not available to relinquish samples from the 3728 Ref # SA on 4/3/03

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

Appendix 5

Data Validation Supporting Documentation

000020

THIS PAGE INTENTIONALLY LEFT BLANK.

JK
4/21/03

000021

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	1603C	1607-B11	DATA PACKAGE: H2138		
VALIDATOR:	FLI	LAB: LLI	DATE: 4/29/03		
CASE:			SDG: H2138		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	CR VI	
SAMPLES/MATRIX					
J00KW4 J00KU9 J00KW0 J00KW1 J00KW2					
J00KW3					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

Initial calibrations performed on all instruments? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 ICP interference checks acceptable? Yes No **N/A**
 ICV and CCV checks performed on all instruments? Yes No **N/A**
 ICV and CCV checks acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

Laboratory blanks analyzed? Yes No N/A

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

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

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

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

Comments: Barium, chromium + lead in EB

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

MS/MSD samples analyzed? Yes No N/A

MS/MSD results acceptable? Yes No N/A

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

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

LCS/BSS samples analyzed? Yes No N/A

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

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

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

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

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

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

Comments: No PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

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: all CRUI over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/08/03

CLIENT: TNUHANFORD B01-054 H2138
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI020-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

000027A

07

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2138
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J00KW4	Soluble Chromium VI	4.3	0.40u	4.0	108.8	1.0
		Insoluble Chromium VI	1440	0.40u	1510	94.8	100
BLANK10	03LVI020-MB1	Soluble Chromium VI	3.9	0.40u	4.0	97.8	1.0
		Insoluble Chromium VI	1320	0.40u	1250	105.8	100

000028

08

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2138
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J00KW4	Chromium VI	0.40u	0.40u	NC	1.0
-004REP	J00KW1	% Solids	97.2	96.2	1.1	1.0

000029

~~00~~

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/11/03

CLIENT: TNUHANFORD B01-054 H2138

LVL LOT #: 0304L120

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	03L0186-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.05	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.13	MG/KG	0.06	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
BLANK1	03C0078-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

000030

10

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/11/03

CLIENT: TNUHANFORD B01-054 H2138

LVL LOT #: 0304L120

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J00KW4	Silver, Total	4.4	0.08u	4.5	97.8	1.0
		Arsenic, Total	167	0.33u	180	92.7	1.0
		Barium, Total	170	1.5	180	93.3	1.0
		Cadmium, Total	4.2	0.04u	4.5	93.3	1.0
		Chromium, Total	17.5	0.25	18.0	95.8	1.0
		Lead, Total	42.5	0.32	45.1	93.5	1.0
		Selenium, Total	165	0.34u	180	91.3	1.0
-002	J00KV9	Mercury, Total	0.18	0.03	0.15	96.8	1.0

000031

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/11/03

CLIENT: TNUHANFORD B01-054 H2138
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0304L120

SAMPLE	SITE ID	ANALYTE	INITIAL	REPLICATE RPD		DILUTION
			RESULT			FACTOR (REP)
-001REP	J00KW4	Silver, Total	0.08u	0.07u	NC	1.0
		Arsenic, Total	0.33u	0.38	NC	1.0
		Barium, Total	1.5	1.1	30.8	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	0.25	0.22	13.4	1.0
		Lead, Total	0.32	0.24	25.6	1.0
		Selenium, Total	0.34u	0.32u	NC	1.0
-002REP	J00KV9	Mercury, Total	0.03	0.02	46.8	1.0

Handwritten: NC 2 b o
 4/11/03

000032

Handwritten: 12

Date: 25 April 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Area Effluent Pipeline & Proximity Site Remediation Activities -
Full Protocol - Waste Site 1607-B7
Subject: Semivolatile - Data Package No. H2131-LLI (SDG No. H2131)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2131-LLI prepared by Lionville Laboratory Incorporated (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	Analysis
J00KH2	3/27/03	Soil	C	See note 1
J00KF7	3/27/03	Soil	C	See note 1
J00KF8	3/27/03	Soil	C	See note 1
J00KF9	3/27/03	Soil	C	See note 1
J00KH0	3/27/03	Soil	C	See note 1
J00KH1	3/27/03	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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

000001

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: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

All holding times were met.

- **Method Blanks**

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

Due to laboratory blank contamination, the bis(2-ethylhexyl)phthalate result in samples J00KH0 and J00KF7 were raised to the RDL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

One equipment blank (J00KH2) was submitted for analysis. All field blank results were acceptable.

000002

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate 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 outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike

000003

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 MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J00KF9/J00KH0) were submitted for analysis. Field duplicate results 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 target detection limits (TDL's) to ensure that laboratory detection levels meet the required criteria. All undetected results in samples J00KV9 and J00KW1 exceeded the TDL and eight analytes exceeded the TDL in all other samples (2-nitroanaline, 2,4-dinitrophenol, 3-nitroanaline, 4-nitrophenol, 4-nitroanaline, 4,6-dinitro-2-methylphenol, pentachlorophenol and 2,4,5-trichlorophenol). Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2131-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 laboratory blank contamination, the bis(2-ethylhexyl)phthalate result in samples J00KH0 and J00KF7 were raised to the RDL, qualified as undetected and flagged "U".

All undetected results in samples J00KV9 and J00KW1 exceeded the TDL and eight analytes exceeded the TDL in all other samples (2-nitroanaline, 2,4-

000004

dinitrophenol, 3-nitroaniline, 4-nitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, pentachlorophenol and 2,4,5-trichlorophenol). 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.

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

000005

Appendix 1

Glossary of Data Reporting Qualifiers

000006

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).

000007

Appendix 2
Summary of Data Qualification

000008

DATA QUALIFICATION SUMMARY

SDG: H2138	REVIEWER: TLI	DATE: 4/29/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000010

Project: BECHTEL-HANFORD
 Laboratory: LLI
 Case: SDG: H2138

Sample Number	Remarks	Sample Date	Extraction Date	Analysis Date	J00KW4		J00KV9		J00KW0		J00KW1		J00KW2		J00KW3	
					TDL	Result	Q	Result								
	E. Blank	4/2/03	4/7/03	4/9/03	660	330 U	3500 U	350 U	4/2/03	680 U	4/2/03	350 U	4/2/03	350 U	4/2/03	Duplicate
	bis(2-Chloroethyl)ether	660	330 U	3500 U	350 U	680 U	350 U	4/7/03	680 U	4/7/03	350 U	4/7/03	350 U	4/7/03	350 U	4/7/03
	2-Chlorophenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	1,3-Dichlorobenzene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	1,4-Dichlorobenzene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	1,2-Dichlorobenzene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2-Methylphenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,2'-oxybis(1-chloropropane)	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	3 and/or 4-Methylphenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	N-Nitroso-di-n-propylamine	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Hexachloroethane	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Nitrobenzene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Isophorone	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2-Nitrophenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,4-Dimethylphenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	bis(2-Chloroethoxy)methane	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,4-Dichlorophenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	1,2,4-Trichlorobenzene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Naphthalene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	4-Chloroaniline	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Hexachlorobutadiene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	4-Chloro-3-methylphenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2-Methylnaphthalene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Hexachlorocyclopentadiene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,4,6-Trichlorophenol	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,4,5-Trichlorophenol	660	840 U	8800 U	860 U	1700 U	870 U	4/9/03	1700 U	4/9/03	870 U	870 U	870 U	870 U	880 U	4/9/03
	2-Chloronaphthalene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2-Nitroaniline	660	840 U	8800 U	860 U	1700 U	870 U	4/9/03	1700 U	4/9/03	870 U	870 U	870 U	870 U	880 U	4/9/03
	Dimethylphthalate	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	Acenaphthylene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03
	2,6-Dinitrotoluene	660	330 U	3500 U	350 U	680 U	350 U	4/9/03	680 U	4/9/03	350 U	4/9/03	350 U	4/9/03	350 U	4/9/03

000011

SEMIVOLATILE/PAH ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD

Laboratory: LLI

Case: SDG: H2138

Sample Number	Remarks	J00KW4		J00KV9	J00KW0		J00KW1		J00KW2		J00KW3	
		Result	Q		Result	Q	Result	Q	Result	Q	Result	Q
	E. Blank											
Sample Date		4/2/03		4/2/03	4/2/03	4/2/03	4/2/03	4/2/03	4/2/03	4/2/03	4/2/03	Duplicate
Extraction Date		4/7/03		4/7/03	4/7/03	4/7/03	4/7/03	4/7/03	4/7/03	4/7/03	4/7/03	
Analysis Date		4/9/03		4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	
Semivolatile (8270C)	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result
3-Nitroaniline	660	840 U		8800 U		860 U		1700 U		870 U		880 U
Acenaphthene	660	330 U		3500 U		350 U		680 U		350 U		350 U
2,4-Dinitrophenol	660	840 U		8800 U		860 U		1700 U		870 U		880 U
4-Nitrophenol	660	840 U		8800 U		860 U		1700 U		870 U		880 U
Dibenzofuran	660	330 U		3500 U		350 U		680 U		350 U		350 U
2,4-Dinitrotoluene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Diethylphthalate	660	330 U		3500 U		350 U		680 U		350 U		350 U
4-Chlorophenyl-phenyl ether	660	330 U		3500 U		350 U		680 U		350 U		350 U
Fluorene	660	330 U		3500 U		350 U		680 U		350 U		350 U
4-Nitroaniline	660	840 U		8800 U		860 U		1700 U		870 U		880 U
4,6-Dinitro-2-methylphenol	660	840 U		8800 U		860 U		1700 U		870 U		880 U
N-Nitrosodiphenylamine	660	330 U		3500 U		350 U		680 U		350 U		350 U
4-Bromophenyl-phenyl ether	660	330 U		3500 U		350 U		680 U		350 U		350 U
Hexachlorobenzene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Pentachlorophenol	660	840 U		8800 U		860 U		1700 U		870 U		880 U
Phenanthrene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Anthracene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Carbazole	660	330 U		3500 U		350 U		680 U		350 U		350 U
Di-n-butylphthalate	660	330 U		3500 U		350 U		680 U		350 U		350 U
Fluoranthene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Pyrene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Butylbenzylphthalate	660	330 U		3500 U		350 U		680 U		350 U		350 U
3,3'-Dichlorobenzidine	660	330 U		3500 U		350 U		680 U		350 U		350 U
Benzo(a)anthracene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Chrysene	660	330 U		3500 U		350 U		680 U		350 U		350 U
bis(2-Ethylhexyl)phthalate	660	76		3500 U		350 U		680 U		350 U		350 U
Di-n-octylphthalate	660	330 U		3500 U		350 U		680 U		350 U		350 U
Benzo(b)fluoranthene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Benzo(k)fluoranthene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Benzo(a)pyrene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Indeno(1,2,3-cd)pyrene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Dibenz(a,h)anthracene	660	330 U		3500 U		350 U		680 U		350 U		350 U
Benzo(g,h,i)perylene	660	330 U		3500 U		350 U		680 U		350 U		350 U

000012

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L120

Client: TNUHANFORD B01-054 H2138

Work Order: 11343606001

Report Date: 04/11/03 11:17

Page: 1a

Cust ID: J00KW4 J00KW4 J00KW4 J00KV9 J00KW0 J00KW1

Sample Information	RFW#:	Matrix:	D.F.:	Units:	J00KW4	J00KW4	J00KW4	J00KV9	J00KW0	J00KW1
	001	001 MS	001 MSD	002	003	004				
	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL				SOIL
	1.00	1.00	1.00	10.0	1.00	2.00				ug/Kg
	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg				ug/Kg
Nitrobenzene-d5	88	%	81	%	67	%	81	%	70	%
2-Fluorobiphenyl	91	%	85	%	83	%	90	%	83	%
Terphenyl-d14	113	%	107	%	80	%	112	%	93	%
Phenol-d5	83	%	77	%	72	%	80	%	70	%
2-Fluorophenol	83	%	77	%	71	%	80	%	67	%
2,4,6-Tribromophenol	83	%	77	%	76	%	88	%	86	%
Phenol	330	U	77	%	3500	U	350	U	680	U
bis(2-Chloroethyl) ether	330	U	330	U	3500	U	350	U	680	U
2-Chlorophenol	330	U	76	%	3500	U	350	U	680	U
1,3-Dichlorobenzene	330	U	330	U	3500	U	350	U	680	U
1,4-Dichlorobenzene	330	U	75	%	3500	U	350	U	680	U
1,2-Dichlorobenzene	330	U	330	U	3500	U	350	U	680	U
2-Methylphenol	330	U	330	U	3500	U	350	U	680	U
2,2'-oxybis(1-Chloropropane)	330	U	330	U	3500	U	350	U	680	U
3- and/or 4-Methylphenol	330	U	330	U	3500	U	350	U	680	U
N-Nitroso-di-n-propylamine	330	U	330	U	3500	U	350	U	680	U
Hexachloroethane	330	U	74	%	3500	U	350	U	680	U
Nitrobenzene	330	U	330	U	3500	U	350	U	680	U
Isophorone	330	U	330	U	3500	U	350	U	680	U
2-Nitrophenol	330	U	330	U	3500	U	350	U	680	U
2,4-Dimethylphenol	330	U	330	U	3500	U	350	U	680	U
bis(2-Chloroethoxy)methane	330	U	330	U	3500	U	350	U	680	U
2,4-Dichlorophenol	330	U	330	U	3500	U	350	U	680	U
1,2,4-Trichlorobenzene	330	U	76	%	3500	U	350	U	680	U
Naphthalene	330	U	330	U	3500	U	350	U	680	U
4-Chloroaniline	330	U	330	U	3500	U	350	U	680	U
Hexachlorobutadiene	330	U	330	U	3500	U	350	U	680	U
4-Chloro-3-methylphenol	330	U	330	U	3500	U	350	U	680	U
2-Methylnaphthalene	330	U	78	%	3500	U	350	U	680	U
Hexachlorocyclopentadiene	330	U	330	U	3500	U	350	U	680	U
2,4,6-Trichlorophenol	330	U	330	U	3500	U	350	U	680	U
2,4,5-Trichlorophenol	840	U	840	U	8800	U	860	U	1700	U

* = Outside of EPA CLP QC limits.

000013

Handwritten signature and date: 4/29/03

Cust ID: J00KW4

J00KW4

J00KW4

J00KV9

J00KW0

J00KW1

RFW#:

001

001 MS

001 MSD

002

003

004

2-Chloronaphthalene	330	U	330	U	330	U	3500	U	350	U	680	U
2-Nitroaniline	840	U	840	U	840	U	8800	U	860	U	1700	U
Dimethylphthalate	330	U	330	U	330	U	3500	U	350	U	680	U
Acenaphthylene	330	U	330	U	330	U	3500	U	350	U	680	U
2,6-Dinitrotoluene	330	U	330	U	330	U	3500	U	350	U	680	U
3-Nitroaniline	840	U	840	U	840	U	8800	U	860	U	1700	U
Acenaphthene	330	U	81	%	80	%	3500	U	350	U	680	U
2,4-Dinitrophenol	840	U	840	U	840	U	8800	U	860	U	1700	U
4-Nitrophenol	840	U	102	%	96	%	8800	U	860	U	1700	U
Dibenzofuran	330	U	330	U	330	U	3500	U	350	U	680	U
2,4-Dinitrotoluene	330	U	99	%	95	%	3500	U	350	U	680	U
Diethylphthalate	330	U	330	U	330	U	3500	U	350	U	680	U
4-Chlorophenyl-phenylether	330	U	330	U	330	U	3500	U	350	U	680	U
Fluorene	330	U	330	U	330	U	3500	U	350	U	680	U
4-Nitroaniline	840	U	840	U	840	U	8800	U	860	U	1700	U
4,6-Dinitro-2-methylphenol	840	U	840	U	840	U	8800	U	860	U	1700	U
N-Nitrosodiphenylamine (1)	330	U	330	U	330	U	3500	U	350	U	680	U
4-Bromophenyl-phenylether	330	U	330	U	330	U	3500	U	350	U	680	U
Hexachlorobenzene	330	U	330	U	330	U	3500	U	350	U	680	U
Pentachlorophenol	840	U	96	%	91	%	8800	U	860	U	1700	U
Phenanthrene	330	U	330	U	330	U	3500	U	350	U	680	U
Anthracene	330	U	330	U	330	U	3500	U	350	U	680	U
Carbazole	330	U	330	U	330	U	3500	U	350	U	680	U
Di-n-butylphthalate	76	J	68	J	71	J	3500	U	350	U	680	U
Fluoranthene	330	U	330	U	330	U	3500	U	350	U	680	U
Pyrene	330	U	103	%	99	%	3500	U	350	U	680	U
Butylbenzylphthalate	330	U	330	U	330	U	3500	U	350	U	680	U
3,3'-Dichlorobenzidine	330	U	330	U	330	U	3500	U	350	U	680	U
Benzo(a)anthracene	330	U	330	U	330	U	3500	U	350	U	680	U
Chrysene	330	U	330	U	330	U	3500	U	350	U	680	U
bis(2-Ethylhexyl)phthalate	330	U	330	U	330	U	3500	U	350	U	680	U
Di-n-octyl phthalate	330	U	330	U	330	U	3500	U	350	U	680	U
Benzo(b)fluoranthene	330	U	330	U	330	U	3500	U	350	U	680	U
Benzo(k)fluoranthene	330	U	330	U	330	U	3500	U	350	U	680	U
Benzo(a)pyrene	330	U	330	U	330	U	3500	U	350	U	680	U
Indeno(1,2,3-cd)pyrene	330	U	330	U	330	U	3500	U	350	U	680	U
Dibenz(a,h)anthracene	330	U	330	U	330	U	3500	U	350	U	680	U
Benzo(g,h,i)perylene	330	U	330	U	330	U	3500	U	350	U	680	U

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

Handwritten signature and date: 4/29/07

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/11/03 11:17

RFW Batch Number: 0304L120

Client: TNUKANTORD B01-054 H2138

Work Order: 11343606001

Page: 2a

Cust ID: J00KW2 J00KW3 J00KW4 SBLKQW BS

Sample Information RFW#: 005 SOIL 03LE0401-MB1 SOIL 03LE0401-MB1 SOIL 03LE0401-MB1
 Matrix: SOIL SOIL SOIL
 D.F.: 1.00 1.00 1.00
 Units: ug/Kg ug/Kg ug/Kg

Surrogate	72 %	71 %	80 %	77 %	84 %
Nitrobenzene-d5	350 U	350 U	330 U	330 U	330 U
2-Fluorobiphenyl	81 %	79 %	85 %	87 %	87 %
Terphenyl-d14	106 %	106 %	90 %	96 %	96 %
Phenol-d5	71 %	67 %	76 %	81 %	81 %
2-Fluorophenol	72 %	70 %	75 %	80 %	80 %
2,4,6-Tribromophenol	80 %	77 %	76 %	86 %	86 %
Phenol	350 U	350 U	330 U	330 U	330 U
bis(2-Chloroethyl) ether	350 U	350 U	330 U	330 U	330 U
2-Chlorophenol	350 U	350 U	330 U	330 U	330 U
1,3-Dichlorobenzene	350 U	350 U	330 U	330 U	330 U
1,4-Dichlorobenzene	350 U	350 U	330 U	330 U	330 U
1,2-Dichlorobenzene	350 U	350 U	330 U	330 U	330 U
2-Methylphenol	350 U	350 U	330 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)	350 U	350 U	330 U	330 U	330 U
3- and/or 4-Methylphenol	350 U	350 U	330 U	330 U	330 U
N-Nitroso-di-n-propylamine	350 U	350 U	330 U	330 U	330 U
Hexachloroethane	350 U	350 U	330 U	330 U	330 U
Nitrobenzene	350 U	350 U	330 U	330 U	330 U
Isophorone	350 U	350 U	330 U	330 U	330 U
2-Nitrophenol	350 U	350 U	330 U	330 U	330 U
2,4-Dimethylphenol	350 U	350 U	330 U	330 U	330 U
bis(2-Chloroethoxy)methane	350 U	350 U	330 U	330 U	330 U
2,4-Dichlorophenol	350 U	350 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene	350 U	350 U	330 U	330 U	330 U
Naphthalene	350 U	350 U	330 U	330 U	330 U
4-Chloroaniline	350 U	350 U	330 U	330 U	330 U
Hexachlorobutadiene	350 U	350 U	330 U	330 U	330 U
4-Chloro-3-methylphenol	350 U	350 U	330 U	330 U	330 U
2-Methylnaphthalene	350 U	350 U	330 U	330 U	330 U
Hexachlorocyclopentadiene	350 U	350 U	330 U	330 U	330 U
2,4,6-Trichlorophenol	350 U	350 U	330 U	330 U	330 U
2,4,5-Trichlorophenol	870 U	880 U	840 U	840 U	840 U

*= Outside of EPA CLP QC limits.

4/29/03

000015

RFW#	005	006	03LE0401-MB1	03LE0401-MB1
2-Chloronaphthalene	350 U	350 U	330 U	330 U
2-Nitroaniline	870 U	880 U	840 U	840 U
Dimethylphthalate	350 U	350 U	330 U	330 U
Acenaphthylene	350 U	350 U	330 U	330 U
2,6-Dinitrotoluene	350 U	350 U	330 U	330 U
3-Nitroaniline	870 U	880 U	840 U	840 U
Acenaphthene	350 U	350 U	330 U	79 %
2,4-Dinitrophenol	870 U	880 U	840 U	840 U
4-Nitrophenol	870 U	880 U	840 U	97 %
Dibenzofuran	350 U	350 U	330 U	330 U
2,4-Dinitrotoluene	350 U	350 U	330 U	95 * %
Diethylphthalate	350 U	350 U	330 U	330 U
4-Chlorophenyl-phenylether	350 U	350 U	330 U	330 U
Fluorene	350 U	350 U	330 U	330 U
4-Nitroaniline	870 U	880 U	840 U	840 U
4,6-Dinitro-2-methylphenol	870 U	880 U	840 U	840 U
N-Nitrosodiphenylamine (1)	350 U	350 U	330 U	330 U
4-Bromophenyl-phenylether	350 U	350 U	330 U	330 U
Hexachlorobenzene	350 U	350 U	330 U	330 U
Pentachlorophenol	870 U	880 U	840 U	93 %
Phenanthrene	350 U	350 U	330 U	330 U
Anthracene	350 U	350 U	330 U	330 U
Carbazole	350 U	350 U	330 U	330 U
Di-n-butylphthalate	350 U	350 U	330 U	330 U
Fluoranthene	350 U	350 U	330 U	330 U
Pyrene	350 U	350 U	330 U	83 %
Butylbenzylphthalate	350 U	350 U	330 U	330 U
3,3'-Dichlorobenzidine	350 U	350 U	330 U	330 U
Benzo(a)anthracene	350 U	350 U	330 U	330 U
Chrysene	350 U	350 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	350 U	350 U	330 U	330 U
Di-n-octyl phthalate	350 U	350 U	330 U	330 U
Benzo(b)fluoranthene	350 U	350 U	330 U	330 U
Benzo(k)fluoranthene	350 U	350 U	330 U	330 U
Benzo(a)pyrene	350 U	350 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	350 U	350 U	330 U	330 U
Dibenz(a,h)anthracene	350 U	350 U	330 U	330 U
Benzo(g,h,i)perylene	350 U	350 U	330 U	330 U

Handwritten: 4/28/03

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

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000017



Client: TNU-HANFORD B01-054
LVL #: 0304L120
SDG/SAF # H2138/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-04-2003

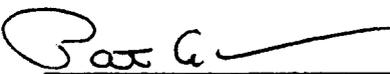
SEMIVOLATILE

Six (6) soil samples were collected on 04-02-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 04-07-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-08,09-2003.

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. Samples J00KW1 and J00KV9 required 2 and 10-fold dilution respectively due to the sample matrix.
5. All surrogate recoveries were within EPA QC limits.
6. Two (2) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
7. One (1) of eleven (11) blank spike recoveries was outside EPA QC limits.
8. Internal standard area criteria were not met for samples J00KV9 and J00KW1; however, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, the samples were not reanalyzed.
9. Manual integrations are performed according to OP 21-06A-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. 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.



J. Michael Taylor
President
Lionville Laboratory Incorporated

04-15-03

Date

som\group\data\bna\tnu-hanford-0304-120.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 29 pages.

Bechtel Hanford Inc. DVI-034-1743

Collector: D. Shea Telephone No. 521-6014 Project Coordinator: KESSNER, JH Price Code: 8L Date Turnaround: 7 21 Days

Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediation Sampling Location: 100 BC, 1607-B-11 Septic system Air Quality: 4/2/03

Site Chart No. ERC 99 071 Field Logbook No. EL-1573 C.O.A. R607BB2F00 Method of Shipment: FED EX

Shipped TO: TMA/RECAR POSSIBLE SAMPLE HAZARDS/REMARKS: Bill of Lading/Air Bill No. SEE 037C

Offsite Property No. A030177

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None
J00KV9	SOIL	4/2/03	1017	Type of Container	G/P	G/P	aG	aG	aG	aG	G/P	G/P
J00KW0	SOIL		1031	No. of Container(s)	1	100% 4/15	1	1	1	1	1	1
J00KW1	SOIL		1046	Volume	120mL	120mL	60mL	250g	60mL	60mL	500mL	60mL
J00KW2	SOIL		1104									
J00KW3	SOIL		1104									

See item (1) in Special Instructions. See item (2) in Special Instructions.

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Wesley Dussler	4/2/03 1652	Friday 3B	4/2/03 1652
REF 3B	4/30/03 0900	SIGAL/ALM	4/30/03 0900
SIGAL/ALM	4/30/03 0900	FED EX	
REF 3B	4/30/03 0900	SIGAL/ALM	4/30/03 1005
SIGAL/ALM	4/30/03 0900	FED EX	
REF 3B	4/30/03 0900	SIGAL/ALM	4/30/03 1005
SIGAL/ALM	4/30/03 0900	FED EX	
REF 3B	4/30/03 0900	SIGAL/ALM	4/30/03 1005
SIGAL/ALM	4/30/03 0900	FED EX	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Selenium, Silver); (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Silver-109m, Strontium-90, Uranium-238)

Personnel not available to relinquish samples from the 3728 Ref # 3B on 4/30/03

LABORATORY SECTION Received By: Title

FINAL SAMPLE DISPOSITION Disposal Method: Disposed By: Date/Time

Appendix 5

Data Validation Supporting Documentation

000021

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	1605C	1607-1311	DATA PACKAGE: H 2138		
VALIDATOR:	TLI	LAB: LLI	DATE: 4/29/03		
CASE:			SDG: H 2138		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00kw4 J00kw3 J00kw2 J00kw1					
J00kw0 J00kv9					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

GC/MS tuning/performance check acceptable? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 Continuing calibrations acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) Yes No N/A
Calibration blank results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: di-n-butyl phthalate in EΦ

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: SS - 11/24/02
all but SS in W9 over
all in W9 + W1 over all - 8 in all others
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: _____

