0059778

SAF-B01-054

100 B/C Area Effluent Pipeline & Proximity Site Remediation Activities - Full Protocol

FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Stacey Callison	H9-02	BL INITIAL/DATE 5/8/03
Jeanette Duncan	H9-02	BL INITIAL/DATE
Jill Thomson	H9-02	BL INITIAL/DATE

SDG H2166 **SAF-B01-054**

Waste Site/Sample Location: 1607-B10 Septic Tank System Disposal Field

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-B10
Subject: Inorganics - Data Package No. H2136-LLI (SDG No. H2136)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2136-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
J00KV3	4/1/03	Soil	C	See note 1
J00KV4	4/1/03	Soil	C	See note 1
J00KV5	4/1/03	Soil	C	See note 1
J00KV6	4/1/03	Soil	C	See note 1
J00KV7	4/1/03	Soil	C	See note 1
J00KV8	4/1/03	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

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 (J00KV8) was submitted for analysis. Silver, barium and chromium(total) 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.

Due to a matrix spike recovery of 437%, all detected mercury results were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00KV4/J00KV5) 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 analyte specific TDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2136-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery of 437%, all detected mercury results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All chromium VI results exceeded the analyte specific 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 Incoroprated, 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

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

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

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

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2136	REVIEWER: TLI	DATE: 4/29/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	All but J00KV8	MS recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD
Laboratory: LLI
Case | SDG: H2136

Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8									
Remarks						Duplicate						E. Blank									
Location		1607-B10		1607-B10		1607-B10		1607-B10		1607-B10		1607-B10									
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03									
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U								
Arsenic	1	3.2		3.7		3.9		3.4		4.5		0.35	U								
Barium	20	56.9		82.4		81.5		68.6		62.0		1.3									
Cadmium	0.2	0.04	U	0.16		0.13		0.08		0.04	U	0.04	U								
Chromium(total)	1	9.7		25.2		24.7		12.0		10.4		0.16									
Mercury	0.2	0.20	J	0.38	J	0.27	J	0.14	J	0.23	J	0.01	U								
Lead	5	17.8		10.7		10.9		17.9		13.3		0.58									
Selenium	1	0.37	U	0.36	U	0.38	U	0.37	U	0.37	U	0.36	U								
Chromium VI	0.1	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U	0.40	U								

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/10/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KV3	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.2	MG/KG	0.36	1.0
		Barium, Total	56.9	MG/KG	0.01	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	0.20 J	MG/KG	0.01	1.0
		Lead, Total	17.8	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-002	J00KV4	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.7	MG/KG	0.35	1.0
		Barium, Total	82.4	MG/KG	0.01	1.0
		Cadmium, Total	0.16	MG/KG	0.04	1.0
		Chromium, Total	25.2	MG/KG	0.06	1.0
		Mercury, Total	0.38 J	MG/KG	0.02	1.0
		Lead, Total	10.7	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
-003	J00KV5	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.9	MG/KG	0.37	1.0
		Barium, Total	81.5	MG/KG	0.01	1.0
		Cadmium, Total	0.13	MG/KG	0.04	1.0
		Chromium, Total	24.7	MG/KG	0.06	1.0
		Mercury, Total	0.27 J	MG/KG	0.02	1.0
		Lead, Total	10.9	MG/KG	0.27	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0

PLV
4/29/03

8

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/10/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L10S

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	J00KV6	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	3.4	MG/KG	0.36	1.0
		Barium, Total	68.6	MG/KG	0.01	1.0
		Cadmium, Total	0.08	MG/KG	0.04	1.0
		Chromium, Total	12.0	MG/KG	0.06	1.0
		Mercury, Total	0.14 J	MG/KG	0.02	1.0
		Lead, Total	17.9	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-005	J00KV7	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	4.5	MG/KG	0.36	1.0
		Barium, Total	62.0	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.4	MG/KG	0.06	1.0
		Mercury, Total	0.23 J	MG/KG	0.02	1.0
		Lead, Total	13.3	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-006	J00KV8	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	1.3	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.16	MG/KG	0.06	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	0.58	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0

4/29/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2136

LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KV3	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-002	J00KV4	% Solids	94.9	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-003	J00KV5	% Solids	94.0	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-004	J00KV6	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-005	J00KV7	% Solids	95.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	J00KV8	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

4/29/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054
LVL#: 0304L105
SDG/SAF#: H2136/B01-054

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

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. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within 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.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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

04-13-03
Date

gmb/m04-105

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054 H2136
LVL#: 0304L105

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

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

njp\i04- 105

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.

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Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-022	Page 1 of 2

Collector: D.Shea	Company Contact: D.Shea	Telephone No.: 521-6014	Project Coordinator: KESSNER, JH
Price Code: 8L	Data Turnaround: Air Quality ☐ 7 days 21 Days		
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system		SAF No.: B01-054
Ice Chest No.: ERC 96 050	Field Logbook No.: EL-1573	COA: R607BA2F00	Method of Shipment: FED EX
Shipped To: TMA/RECRA	Offsite Property No.: A030176		Bill of Lading/Air Bill No.: SFE 05 P C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	10	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time							
J00KV3	SOIL	4/1/03	1020	✓	✓	✓	✓	✓	✓	✓
J00KV4	SOIL		1040	✓	✓	✓	✓	✓	✓	✓
J00KV5	SOIL		1040	✓	✓	✓	✓	✓	✓	✓
J00KV6	SOIL		1134	✓	✓	✓	✓	✓	✓	✓
J00KV7	SOIL		1157	✓	✓	✓	✓	✓	✓	✓

0000018

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: DWSchen DWSchen	Received By/Stored In: Fridge 3A	4/1/03 1732
Relinquished By/Removed From: REF 3A	Received By/Stored In: SJGALE	4203 0700
Relinquished By/Removed From: SJGALE	Received By/Stored In: FED EX	4203 0700
Relinquished By/Removed From: FED EX	Received By/Stored In:	4.3.03/0855
Relinquished By/Removed From:	Received By/Stored In:	
Relinquished By/Removed From:	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-108 metastable~~, Uranium-238)

DWSchen 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Sol
DL=Drum Liq
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

RHI-FF-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-022	Page 2 of 2

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: ~~21~~ Days 7days
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system	SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96 050	Field Logbook No.: EL-1573 — COA: R607BA2F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030176	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time							
J00KV8	SOIL	4/1/03	1005 J00KV8	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	4/1/03 1732	Fridge 3A	4/1/03 1732
REF 3A	4203 0700	S. Gale [signature]	4203 0700
S. Gale [signature]	4203 0700	FED EX	
Fed Ex	4-3-03 / 0955	[signature]	4-3-03 / 0955

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-metastable~~, Uranium-238)

[signature] 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

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

RHLFF-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BX		1607-B10	DATA PACKAGE: H2136		
VALIDATOR: TLI		LAB: LLI		DATE: 4/29/03	
CASE:			SDG: H2136		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	CRUI	
SAMPLES/MATRIX					
J00KU3 J00KU4 J00KU5 J00KU6					
J00KU7 J00KU8					
					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 4/21/03

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: Silver, Barium, Chromium (total) in MB – OK
Barium CR (total) 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: 437 on Hg – Toll detects
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

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

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

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

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

Comments: all CR VI are

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/10/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0185-MB1	Silver, Total	0.09	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.06	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.12	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	03C0074-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/10/03

CLIENT: TNUHANFORD B01-054 H2136

LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00KV3	Silver, Total	5.0	0.08u	5.1	98.0	1.0
		Arsenic, Total	194	3.2	205	92.8	1.0
		Barium, Total	253	56.9	205	95.5	1.0
		Cadmium, Total	4.7	0.04u	5.1	92.2	1.0
		Chromium, Total	29.5	9.7	20.5	96.6	1.0
		Mercury, Total	0.81	0.20	0.14	437.7	1.0
		Lead, Total	62.5	17.8	51.3	87.1	1.0
		Selenium, Total	187	0.37u	205	91.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/10/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00KV3	Silver, Total	0.08u	0.08u	NC	1.0
		Arsenic, Total	3.2	3.3	3.1	1.0
		Barium, Total	56.9	63.9	11.6	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	9.7	11.5	17.0	1.0
		Mercury, Total	0.20	0.18	14.8	1.0
		Lead, Total	17.8	18.3	2.8	1.0
		Selenium, Total	0.37u	0.37u	NC	1.0

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/08/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L105

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

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

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2136

LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00KV3	Soluble Chromium VI	4.6	0.42u	4.2	104.9	1.0
		Insoluble Chromium VI	1290	0.42u	1140	113.8	100
BLANK10	03LVI020-MS1	Soluble Chromium VI	3.9	0.40u	4.0	97.8	1.0
		Insoluble Chromium VI	1320	0.40u	1250	105.8	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/08/03

CLIENT: TNUHANFORD B01-054 H2136 LVL LOT #: 0304L105

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00KV3	% Solids	95.6	96.1	0.49	1.0
		Chromium VI	0.42u	0.42u	NC	1.0

05

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-B10
Subject: PCB/Pesticide - Data Package No. H2136-LLI (SDG No. H2136)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2136-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
J00KV3	4/1/03	Soil	C	See note 1
J00KV4	4/1/03	Soil	C	See note 1
J00KV5	4/1/03	Soil	C	See note 1
J00KV6	4/1/03	Soil	C	See note 1
J00KV7	4/1/03	Soil	C	See note 1
J00KV8	4/1/03	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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were acceptable.

- **Method Blank**

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

All method blank target compound results were acceptable.

Field Blanks

One equipment blank (J00KV8) 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

One set of field duplicate samples (J00KV4/J00KV5) 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 reported toxaphene and methoxychlor results exceeded the RDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

  Data Package No. H2136-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 reported toxaphene and methoxychlor 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 Incoroprated, 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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2136	REVIEWER: TLI	DATE: 4/29/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD															
Laboratory: Lionville Laboratory Inc.															
Case:	SDG: H2136														
Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8			
Remarks						Duplicate						E. Blank			
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03			
Extraction Date		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03			
Analysis Date		4/9/03		4/10/03		4/10/03		4/10/03		4/9/03		4/9/03			
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	35	U	35	U	35	U	35	U	35	U	33	U		
Aroclor-1221	16.5	70	U	70	U	71	U	70	U	70	U	67	U		
Aroclor-1232	16.5	35	U	35	U	35	U	35	U	35	U	33	U		
Aroclor-1242	16.5	35	U	35	U	35	U	35	U	35	U	33	U		
Aroclor-1248	16.5	35	U	35	U	35	U	35	U	35	U	33	U		
Aroclor-1254	16.5	35	U	35		34		57		35	U	33	U		
Aroclor-1260	16.5	35	U	35	U	35	U	35	U	35	U	33	U		
Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8			
Remarks						Duplicate						E. Blank			
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03			
Extraction Date		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03			
Analysis Date		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03		4/8/03			
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Beta-BHC	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Delta-BHC	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Gamma-BHC (Lindane)	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Heptachlor	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Aldrin	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Heptachlor Epoxide	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Endosulfan I	5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Dieldrin	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
4,4'-DDE	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
Endrin	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
Endosulfan II	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
4,4'-DDD	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
Endosulfan Sulfate	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
4,4'-DDT	5	3.5	U	3.9		3.5		4.5		3.5	U	3.3	U		
Methoxychlor	5	17	U	18	U	18	U	17	U	18	U	17	U		
Endrin Ketone	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
Endrin Aldehyde	5	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.3	U		
alpha-Chlordane	16.5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
gamma-Chlordane	16.5	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.7	U		
Toxaphene	5	170	U	180	U	180	U	170	U	180	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

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/10/03 13:06

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 1

	Cust ID:	J00KV3		J00KV3		J00KV3		J00KV4		J00KV5		J00KV6	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate:	Tetrachloro-m-xylene	95	%	90	%	95	%	100	%	90	%	90	%
	Decachlorobiphenyl	100	%	100	%	105	%	110	%	105	%	110	%
			fl		fl		fl		fl		fl		fl
Aroclor-1016		35	U	97	%	104	%	35	U	35	U	35	U
Aroclor-1221		70	U	70	U	70	U	70	U	71	U	70	U
Aroclor-1232		35	U	35	U	35	U	35	U	35	U	35	U
Aroclor-1242		35	U	35	U	35	U	35	U	35	U	35	U
Aroclor-1248		35	U	35	U	35	U	35	U	35	U	35	U
Aroclor-1254		35	U	35	U	35	U	35		34	J	57	
Aroclor-1260		35	U	108	%	113	%	35	U	35	U	35	U

	Cust ID:	J00KV7		J00KV8		PBLKQA		PBLKQA BS	
Sample Information	RFW#:	005		006		03LE0398-MB1		03LE0398-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:	Tetrachloro-m-xylene	90	%	95	%	90	%	95	%
	Decachlorobiphenyl	100	%	105	%	100	%	110	%
			fl		fl		fl		fl
Aroclor-1016		35	U	33	U	33	U	103	%
Aroclor-1221		70	U	67	U	67	U	67	U
Aroclor-1232		35	U	33	U	33	U	33	U
Aroclor-1242		35	U	33	U	33	U	33	U
Aroclor-1248		35	U	33	U	33	U	33	U
Aroclor-1254		35	U	33	U	33	U	33	U
Aroclor-1260		35	U	33	U	33	U	114	%

000011

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

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

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 1 Report Date: 04/09/03 12:26

Cust ID:	J00KV3	J00KV3	J00KV3	J00KV4	J00KV5	J00KV6
Sample Information RFW#:	001	001 MS	001 MSD	002	003	004
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene	105 %	100 %	115 %	95 %	85 %	95 %
Decachlorobiphenyl	110 %	115 %	125 * %	115 %	100 %	115 %
Alpha-BHC	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
Beta-BHC	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
Delta-BHC	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
gamma-BHC (Lindane)	1.7 U	80 %	94 %	1.8 U	1.8 U	1.7 U
Heptachlor	1.7 U	94 %	106 %	1.8 U	1.8 U	1.7 U
Aldrin	1.7 U	82 %	94 %	1.8 U	1.8 U	1.7 U
Heptachlor epoxide	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
Endosulfan I	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
Dieldrin	3.5 U	98 %	110 %	3.5 U	3.5 U	3.5 U
4,4'-DDE	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Endrin	3.5 U	115 %	130 %	3.5 U	3.5 U	3.5 U
Endosulfan II	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
4,4'-DDD	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Endosulfan sulfate	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
4,4'-DDT	3.5 U	98 %	116 %	3.9	3.5	4.5
Methoxychlor	17 U	17 U	17 U	18 U	18 U	17 U
Endrin ketone	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
Endrin aldehyde	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
alpha-Chlordane	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
gamma-Chlordane	1.7 U	1.7 U	1.7 U	1.8 U	1.8 U	1.7 U
Toxaphene	170 U	170 U	170 U	180 U	180 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

000012

4/10/03

4/24/03

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

Report Date: 04/09/03 12:26

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 2

	Cust ID:	J00KV7	J00KV8	PBLKQA	PBLKQA BS
Sample Information	RFW#:	005	006	03LE0398-MB1	03LE0398-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:	Tetrachloro-m-xylene	90 %	100 %	100 %	90 %
	Decachlorobiphenyl	110 %	110 %	110 %	100 %
Alpha-BHC		1.8 U	1.7 U	1.7 U	1.7 U
Beta-BHC		1.8 U	1.7 U	1.7 U	1.7 U
Delta-BHC		1.8 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.8 U	1.7 U	1.7 U	78 %
Heptachlor		1.8 U	1.7 U	1.7 U	90 %
Aldrin		1.8 U	1.7 U	1.7 U	80 %
Heptachlor epoxide		1.8 U	1.7 U	1.7 U	1.7 U
Endosulfan I		1.8 U	1.7 U	1.7 U	1.7 U
Dieldrin		3.5 U	3.3 U	3.3 U	93 %
4,4'-DDE		3.5 U	3.3 U	3.3 U	3.3 U
Endrin		3.5 U	3.3 U	3.3 U	109 %
Endosulfan II		3.5 U	3.3 U	3.3 U	3.3 U
4,4'-DDD		3.5 U	3.3 U	3.3 U	3.3 U
Endosulfan sulfate		3.5 U	3.3 U	3.3 U	3.3 U
4,4'-DDT		3.5 U	3.3 U	3.3 U	94 %
Methoxychlor		18 U	17 U	17 U	17 U
Endrin ketone		3.5 U	3.3 U	3.3 U	3.3 U
Endrin aldehyde		3.5 U	3.3 U	3.3 U	3.3 U
alpha-Chlordane		1.8 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane		1.8 U	1.7 U	1.7 U	1.7 U
Toxaphene		180 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

RK 4/24/9

4/10/03

000013

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054
LVL #: 0304L105
SDG/SAF #: H2136/B01-054

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

PCB

The set of samples consisted of six (6) soil samples collected on 04-01-03.

The samples and their associated QC samples were extracted on 04-04-03 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 3550 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. The 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.

9. Patterns for Aroclors 1254 and 1260 were identified in these samples. The reported Aroclors were chosen based on the best pattern match and fit. Quantitation was performed using congeners common to both Aroclors to give the best overall total PCB concentration.

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 10 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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

4/14/03
Date

pef\r:\group\data\pest\tnu hanford\14L-105.pcb

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-054
LVL #: 0304L105
SDG/SAF #: H2136/B01-054

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

PESTICIDE

The set of samples consisted of six (6) soil samples collected on 04-01-03.

The samples and their associated QC samples were extracted on 04-04-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-08-03. 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. All samples and their associated QC samples received 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. 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, with the exception of the target compounds analyzed on 04-07,08-03 and 04-08-03 on the RTX-CLP2 column. The data reflected an increase in instrument response, so the ability to identify these compounds was not impaired. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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

4/8/03
Date

pef\r:\group\data\pest\tnu hanford\04L-105.pes

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-022
Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turn: 21 D: 7days
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system	SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96 050	Field Logbook No.: EL-1573 — COA: R607BA2F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030176	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time							
J00KV8	SOIL	4/1/03	1009 J00KV8	✓	✓	✓	✓	✓	✓	✓

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Dwshea Dwshea	4/1/03 1732	Fridge 3A	4/1/03 1732
Relinquished By/Removed From	REF 3A	4203 0700	S.J. Gale	4203 0700
Relinquished By/Removed From	S.J. Gale	4203 0700	FED EX	
Relinquished By/Removed From	Fed Ex	4-3-03 /0955	[illegible]	4-3-03/0955
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			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-108-metastable~~, Uranium-238)

Dwshea 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

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

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

000019

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector D.Shea	Company Contact D.Shea / Telephone No. 521-6014	Project Coordinator KESSNER, JH	Price Code 8L / Data Turnaround Air Quality 7 days 21 Days
Project Designation 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location 100 BC, 1607-B-10 Septic system	SAF No. B01-054	
Ice Chest No. ERC 96 050	Field Logbook No. EL-1573 / COA R607BA2F00	Method of Shipment FED EX	
Shipped To TMA/RECRA	Offsite Property No. A030176	Bill of Lading/Air Bill No. SFE 05 P C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	1 DW7	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No. / Matrix * / Sample Date / Sample Time										
J00KV3 / SOIL / 4/1/03 / 1020	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV4 / SOIL / ↓ / 1040	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV5 / SOIL / ↓ / 1040	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV6 / SOIL / ↓ / 1134	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV7 / SOIL / ↓ / 1157	✓	✓	✓	✓	✓	✓	✓	✓		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DWSha DWSha	1732 4/1/03	Received By/Stored In: Fridge 3A	4/1/03 1732
Relinquished By/Removed From: REF 3A	4203 0700	Received By/Stored In: SJGALE	4203 0700
Relinquished By/Removed From: SJGALE	4203 0700	Received By/Stored In: FED EX	
Relinquished By/Removed From: Fed Ex	4-3-03 / 0955	Received By/Stored In:	4-3-03/0955
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-108 metastable~~, Uranium-238)

DWSha 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

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

000020

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 1607-B10			DATA PACKAGE: H2136		
VALIDATOR: TCI		LAB: LCI		DATE: 4/29/03	
CASE:			SDG: H2136		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J00KV3		J00KV4	J00KV5		
J00KV6		J00KV7	J00KV8		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

Comments: ~~all undetected but alpha gamma chlordane~~ 5/3/09
toxaphene + methoxyclor conc

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

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

Check recoveries aceptable? ..... Yes No N/A

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

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

GPC check recoveries aceptable? ..... 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-B10
Subject: Semivolatile - Data Package No. H2136-LLI (SDG No. H2136)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2136-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
J00KV3	4/1/03	Soil	C	See note 1
J00KV4	4/1/03	Soil	C	See note 1
J00KV5	4/1/03	Soil	C	See note 1
J00KV6	4/1/03	Soil	C	See note 1
J00KV7	4/1/03	Soil	C	See note 1
J00KV8	4/1/03	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

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 method blank contamination, the bis(2-ethylhexyl)phthlate results in samples J00KV4, J00KV6 and J00KV8 were raised to the TDL and flagged "U".

All other method blank results were acceptable.

<u>Field Blanks</u>

One equipment blank (J00KV8) was submitted for analysis. Bis(2-ethylhexyl)phthlate was detected in the equipment blank but due to method

blank contamination, the result was raised to the TDL and flagged "U". All other field blank results were acceptable.

- **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 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 (J00KV4/J00KV5) 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. Seven analytes exceeded the RDL in all 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. H2136-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the bis(2-ethylhexyl)phthlate results in samples J00KV4, J00KV6 and J00KV8 were raised to the TDL and flagged "U".

Seven analytes exceeded the RDL in all 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.

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 Incoroprated, 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

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2136	REVIEWER: TLI	DATE: 4/29/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
bis(2-ethylhexyl)phthalate	U	J00KV4, J00KV6, J00KV8	Blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2136														
Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8			
Remarks						Duplicate						E. Blank			
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03			
Extraction Date		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03			
Analysis Date		4/9/03		4/9/03		4/9/03		4/9/03		4/10/03		4/10/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
bis(2-Chloroethyl)ether	660	350	U	350	U	350	U	350	U	350	U	330	U		
2-Chlorophenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
1,3-Dichlorobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
1,4-Dichlorobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
1,2-Dichlorobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
2-Methylphenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,2'-oxybis(1-chloropropane)	660	350	U	350	U	350	U	350	U	350	U	330	U		
3 and/or 4-Methylphenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
N-Nitroso-di-n-propylamine	660	350	U	350	U	350	U	350	U	350	U	330	U		
Hexachloroethane	660	350	U	350	U	350	U	350	U	350	U	330	U		
Nitrobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Isophorone	660	350	U	350	U	350	U	350	U	350	U	330	U		
2-Nitrophenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4-Dimethylphenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
bis(2-Chloroethoxy)methane	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4-Dichlorophenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
1,2,4-Trichlorobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Naphthalene	660	350	U	350	U	350	U	350	U	350	U	330	U		
4-Chloroaniline	660	350	U	350	U	350	U	350	U	350	U	330	U		
Hexachlorobutadiene	660	350	U	350	U	350	U	350	U	350	U	330	U		
4-Chloro-3-methylphenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
2-Methylnaphthalene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Hexachlorocyclopentadiene	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4,6-Trichlorophenol	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4,5-Trichlorophenol	660	870	U	880	U	880	U	870	U	880	U	840	U		
2-Chloronaphthalene	660	350	U	350	U	350	U	350	U	350	U	330	U		
2-Nitroaniline	660	870	U	880	U	880	U	870	U	880	U	840	U		
Dimethylphthalate	660	350	U	350	U	350	U	350	U	350	U	330	U		
Acenaphthylene	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,6-Dinitrotoluene	660	350	U	350	U	350	U	350	U	350	U	330	U		

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

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

Project: BECHTEL-HANFORD
Laboratory: LLI
Case: SDG: H2136

Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8			
Remarks						Duplicate						E. Blank			
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03			
Extraction Date		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03		4/4/03			
Analysis Date		4/9/03		4/9/03		4/9/03		4/9/03		4/10/03		4/10/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	870	U	880	U	880	U	870	U	880	U	840	UJ		
Acenaphthene	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4-Dinitrophenol	660	870	U	880	U	880	U	870	U	880	U	840	U		
4-Nitrophenol	660	870	U	880	U	880	U	870	U	880	U	840	U		
Dibenzofuran	660	350	U	350	U	350	U	350	U	350	U	330	U		
2,4-Dinitrotoluene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Diethylphthalate	660	350	U	350	U	350	U	350	U	350	U	330	U		
4-Chlorophenyl-phenyl ether	660	350	U	350	U	350	U	350	U	350	U	330	U		
Fluorene	660	350	U	350	U	350	U	350	U	350	U	330	U		
4-Nitroaniline	660	870	UJ	880	U	880	U	870	UJ	880	U	840	UJ		
4,6-Dinitro-2-methylphenol	660	870	U	880	U	880	U	870	U	880	U	840	U		
N-Nitrosodiphenylamine	660	350	U	350	U	350	U	350	U	350	U	330	U		
4-Bromophenyl-phenyl ether	660	350	U	350	U	350	U	350	U	350	U	330	U		
Hexachlorobenzene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Pentachlorophenol	660	870	U	880	U	880	U	870	U	880	U	840	U		
Phenanthrene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Anthracene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Carbazole	660	350	U	350	U	350	U	350	U	350	U	330	U		
Di-n-butylphthalate	660	350	U	350	U	350	U	350	U	350	U	330	U		
Fluoranthene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Pyrene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Butylbenzylphthalate	660	350	U	350	U	350	U	350	U	350	U	330	U		
3,3'-Dichlorobenzidine	660	350	U	350	U	350	U	350	U	350	U	330	UJ		
Benzo(a)anthracene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Chrysene	660	350	U	350	U	350	U	350	U	350	U	330	U		
bis(2-Ethylhexyl)phthalate	660	350	U	660	U	350	U	660	U	350	U	660	U		
Di-n-octylphthalate	660	350	U	350	U	350	U	350	U	350	U	330	U		
Benzo(b)fluoranthene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Benzo(k)fluoranthene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Benzo(a)pyrene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Indeno(1,2,3-cd)pyrene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Dibenz(a,h)anthracene	660	350	U	350	U	350	U	350	U	350	U	330	U		
Benzo(g,h,i)perylene	660	350	U	350	U	350	U	350	U	350	U	330	U		

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

000012

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Report Date: 04/10/03 15:34 Page: 1a

	Cust ID:	J00KV3		J00KV3		J00KV3		J00KV4		J00KV5		J00KV6	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	65	%	56	%	67	%	68	%	62	%	69	%
	2-Fluorobiphenyl	78	%	73	%	83	%	81	%	76	%	80	%
	Terphenyl-d14	118	%	111	%	118	%	126	%	106	%	112	%
	Phenol-d5	75	%	69	%	79	%	79	%	73	%	78	%
	2-Fluorophenol	76	%	65	%	80	%	84	%	72	%	83	%
	2,4,6-Tribromophenol	102	%	101	%	105	%	109	%	92	%	103	%
			fl		fl		fl		fl		fl		fl
Phenol		350	U	65	%	75	%	350	U	350	U	350	U
bis(2-Chloroethyl)ether		350	U	350	U	350	U	350	U	350	U	350	U
2-Chlorophenol		350	U	73	%	89	%	350	U	350	U	350	U
1,3-Dichlorobenzene		350	U	350	U	350	U	350	U	350	U	350	U
1,4-Dichlorobenzene		350	U	57	%	74	%	350	U	350	U	350	U
1,2-Dichlorobenzene		350	U	350	U	350	U	350	U	350	U	350	U
2-Methylphenol		350	U	350	U	350	U	350	U	350	U	350	U
2,2'-oxybis(1-Chloropropane)		350	U	350	U	350	U	350	U	350	U	350	U
3- and/or 4-Methylphenol		350	U	350	U	350	U	350	U	350	U	350	U
N-Nitroso-di-n-propylamine		350	U	65	%	71	%	350	U	350	U	350	U
Hexachloroethane		350	U	350	U	350	U	350	U	350	U	350	U
Nitrobenzene		350	U	350	U	350	U	350	U	350	U	350	U
Isophorone		350	U	350	U	350	U	350	U	350	U	350	U
2-Nitrophenol		350	U	350	U	350	U	350	U	350	U	350	U
2,4-Dimethylphenol		350	U	350	U	350	U	350	U	350	U	350	U
bis(2-Chloroethoxy)methane		350	U	350	U	350	U	350	U	350	U	350	U
2,4-Dichlorophenol		350	U	350	U	350	U	350	U	350	U	350	U
1,2,4-Trichlorobenzene		350	U	55	%	69	%	350	U	350	U	350	U
Naphthalene		350	U	350	U	350	U	350	U	350	U	350	U
4-Chloroaniline		350	U	350	U	350	U	350	U	350	U	350	U
Hexachlorobutadiene		350	U	350	U	350	U	350	U	350	U	350	U
4-Chloro-3-methylphenol		350	U	88	%	93	%	350	U	350	U	350	U
2-Methylnaphthalene		350	U	350	U	350	U	350	U	350	U	350	U
Hexachlorocyclopentadiene		350	U	350	U	350	U	350	U	350	U	350	U
2,4,6-Trichlorophenol		350	U	350	U	350	U	350	U	350	U	350	U
2,4,5-Trichlorophenol		870	U	870	U	870	U	880	U	880	U	870	U

*= Outside of EPA CLP QC limits.

000013

5

Okze 4/23/03

RFW Batch Number: V3048105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 1b

Cust ID:	J00KV3		J00KV3		J00KV3		J00KV4		J00KV5		J00KV6	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	350	U	350	U	350	U	350	U	350	U	350	U
2-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
Dimethylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
Acenaphthylene	350	U	350	U	350	U	350	U	350	U	350	U
2,6-Dinitrotoluene	350	U	350	U	350	U	350	U	350	U	350	U
3-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
Acenaphthene	350	U	78	%	88	%	350	U	350	U	350	U
2,4-Dinitrophenol	870	U	870	U	870	U	880	U	880	U	870	U
4-Nitrophenol	870	U	127 *	%	137 *	%	880	U	880	U	870	U
Dibenzofuran	350	U	350	U	350	U	350	U	350	U	350	U
2,4-Dinitrotoluene	350	U	87	%	98 *	%	350	U	350	U	350	U
Diethylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
4-Chlorophenyl-phenylether	350	U	350	U	350	U	350	U	350	U	350	U
Fluorene	350	U	350	U	350	U	350	U	350	U	350	U
4-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
4,6-Dinitro-2-methylphenol	870	U	870	U	870	U	880	U	880	U	870	U
N-Nitrosodiphenylamine (1)	350	U	350	U	350	U	350	U	350	U	350	U
4-Bromophenyl-phenylether	350	U	350	U	350	U	350	U	350	U	350	U
Hexachlorobenzene	350	U	350	U	350	U	350	U	350	U	350	U
Pentachlorophenol	870	U	87	%	85	%	880	U	880	U	870	U
Phenanthrene	350	U	350	U	350	U	24	J	350	U	350	U
Anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Carbazole	350	U	350	U	350	U	350	U	350	U	350	U
Di-n-butylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
Fluoranthene	350	U	350	U	350	U	30	J	350	U	350	U
Pyrene	350	U	105	%	108	%	27	J	350	U	350	U
Butylbenzylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
3,3'-Dichlorobenzidine	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Chrysene	350	U	350	U	350	U	350	U	350	U	350	U
bis(2-Ethylhexyl)phthalate	350	U	24	JB	22	JB	660 ~~[illegible]~~ 5/4/92	U	350	U	660 ~~[illegible]~~ 5/4/92	U
Di-n-octyl phthalate	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(b)fluoranthene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(k)fluoranthene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)pyrene	350	U	350	U	350	U	350	U	350	U	350	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	350	U	350	U	350	U	350	U
Dibenz(a,h)anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(g,h,i)perylene	350	U	350	U	350	U	350	U	350	U	350	U

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

5/3/92

0000014

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 1b

Cust ID:	J00KV3		J00KV3		J00KV3		J00KV4		J00KV5		J00KV6	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	350	U	350	U	350	U	350	U	350	U	350	U
2-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
Dimethylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
Acenaphthylene	350	U	350	U	350	U	350	U	350	U	350	U
2,6-Dinitrotoluene	350	U	350	U	350	U	350	U	350	U	350	U
3-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
Acenaphthene	350	U	78	%	88	%	350	U	350	U	350	U
2,4-Dinitrophenol	870	U	870	U	870	U	880	U	880	U	870	U
4-Nitrophenol	870	U	127 *	%	137 *	%	880	U	880	U	870	U
Dibenzofuran	350	U	350	U	350	U	350	U	350	U	350	U
2,4-Dinitrotoluene	350	U	87	%	98 *	%	350	U	350	U	350	U
Diethylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
4-Chlorophenyl-phenylether	350	U	350	U	350	U	350	U	350	U	350	U
Fluorene	350	U	350	U	350	U	350	U	350	U	350	U
4-Nitroaniline	870	U	870	U	870	U	880	U	880	U	870	U
4,6-Dinitro-2-methylphenol	870	U	870	U	870	U	880	U	880	U	870	U
N-Nitrosodiphenylamine (1)	350	U	350	U	350	U	350	U	350	U	350	U
4-Bromophenyl-phenylether	350	U	350	U	350	U	350	U	350	U	350	U
Hexachlorobenzene	350	U	350	U	350	U	350	U	350	U	350	U
Pentachlorophenol	870	U	87	%	85	%	880	U	880	U	870	U
Phenanthrene	350	U	350	U	350	U	24	J	350	U	350	U
Anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Carbazole	350	U	350	U	350	U	350	U	350	U	350	U
Di-n-butylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
Fluoranthene	350	U	350	U	350	U	30	J	350	U	350	U
Pyrene	350	U	105	%	108	%	27	J	350	U	350	U
Butylbenzylphthalate	350	U	350	U	350	U	350	U	350	U	350	U
3,3'-Dichlorobenzidine	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Chrysene	350	U	350	U	350	U	350	U	350	U	350	U
bis(2-Ethylhexyl)phthalate	350	U	24	JB	22	JB	330 ~~10~~ ~~JB~~ 12	U	350	U	330 ~~27~~ ~~JB~~ 12	U
Di-n-octyl phthalate	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(b)fluoranthene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(k)fluoranthene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(a)pyrene	350	U	350	U	350	U	350	U	350	U	350	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	350	U	350	U	350	U	350	U
Dibenz(a,h)anthracene	350	U	350	U	350	U	350	U	350	U	350	U
Benzo(g,h,i)perylene	350	U	350	U	350	U	350	U	350	U	350	U

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

0000014

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/10/03 15:34

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 2a

	Cust ID:	J00KV7		J00KV8		SBLKQS		SBLKQS BS	
Sample Information	RFW#:	005		006		03LE0397-MB1		03LE0397-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	49	%	50	%	64	%	73	%
	2-Fluorobiphenyl	54	%	59	%	73	%	82	%
	Terphenyl-d14	70	%	87	%	110	%	120	%
	Phenol-d5	49	%	52	%	74	%	81	%
	2-Fluorophenol	48	%	48	%	78	%	83	%
	2,4,6-Tribromophenol	53	%	64	%	83	%	94	%
Phenol		350	U	330	U	330	U	75	%
bis(2-Chloroethyl)ether		350	U	330	U	330	U	330	U
2-Chlorophenol		350	U	330	U	330	U	92	%
1,3-Dichlorobenzene		350	U	330	U	330	U	330	U
1,4-Dichlorobenzene		350	U	330	U	330	U	80	%
1,2-Dichlorobenzene		350	U	330	U	330	U	330	U
2-Methylphenol		350	U	330	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		350	U	330	U	330	U	330	U
3- and/or 4-Methylphenol		350	U	330	U	330	U	330	U
N-Nitroso-di-n-propylamine		350	U	330	U	330	U	71	%
Hexachloroethane		350	U	330	U	330	U	330	U
Nitrobenzene		350	U	330	U	330	U	330	U
Isophorone		350	U	330	U	330	U	330	U
2-Nitrophenol		350	U	330	U	330	U	330	U
2,4-Dimethylphenol		350	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane		350	U	330	U	330	U	330	U
2,4-Dichlorophenol		350	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene		350	U	330	U	330	U	73	%
Naphthalene		350	U	330	U	330	U	330	U
4-Chloroaniline		350	U	330	U	330	U	330	U
Hexachlorobutadiene		350	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		350	U	330	U	330	U	89	%
2-Methylnaphthalene		350	U	330	U	330	U	330	U
Hexachlorocyclopentadiene		350	U	330	U	330	U	330	U
2,4,6-Trichlorophenol		350	U	330	U	330	U	330	U
2,4,5-Trichlorophenol		880	U	840	U	840	U	840	U

*= Outside of EPA CLP QC limits.

000015

RMC 4/28/03

RFW Batch Number: 0304L105 Client: TNUHANFORD B01-054 H2136 Work Order: 11343606001 Page: 2b

Cust ID:	J00KV7		J00KV8		SBLKQS		SBLKQS BS	
RFW#:	005		006		03LE0397-MB1		03LE0397-MB1	
2-Chloronaphthalene	350	U	330	U	330	U	330	U
2-Nitroaniline	880	U	840	U	840	U	840	U
Dimethylphthalate	350	U	330	U	330	U	330	U
Acenaphthylene	350	U	330	U	330	U	330	U
2,6-Dinitrotoluene	350	U	330	U	330	U	330	U
3-Nitroaniline	880	U	840	U	840	U	840	U
Acenaphthene	350	U	330	U	330	U	83	%
2,4-Dinitrophenol	880	U	840	U	840	U	840	U
4-Nitrophenol	880	U	840	U	840	U	129 *	%
Dibenzofuran	350	U	330	U	330	U	330	U
2,4-Dinitrotoluene	350	U	330	U	330	U	95 *	%
Diethylphthalate	350	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	330	U	330	U	330	U
Fluorene	350	U	330	U	330	U	330	U
4-Nitroaniline	880	U	840	U	840	U	840	U
4,6-Dinitro-2-methylphenol	880	U	840	U	840	U	840	U
N-Nitrosodiphenylamine (1)	350	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	330	U	330	U	330	U
Hexachlorobenzene	350	U	330	U	330	U	330	U
Pentachlorophenol	880	U	840	U	840	U	94	%
Phenanthrene	350	U	330	U	330	U	330	U
Anthracene	350	U	330	U	330	U	330	U
Carbazole	350	U	330	U	330	U	330	U
Di-n-butylphthalate	350	U	330	U	330	U	330	U
Fluoranthene	350	U	330	U	330	U	330	U
Pyrene	350	U	330	U	330	U	106	%
Butylbenzylphthalate	350	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	350	U	330	U	330	U	330	U
Benzo(a)anthracene	350	U	330	U	330	U	330	U
Chrysene	350	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	350	U	660 ~~330~~ ~~JB~~	U	650		1600	B
Di-n-octyl phthalate	350	U	330	U	330	U	330	U
Benzo(b)fluoranthene	350	U	330	U	330	U	330	U
Benzo(k)fluoranthene	350	U	330	U	330	U	330	U
Benzo(a)pyrene	350	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	350	U	330	U	330	U	330	U
Dibenz(a,h)anthracene	350	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	350	U	330	U	330	U	330	U

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

RKS 4/22/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-054
LVL #: 0304L105
SDG/SAF # H2136/B01-054

W.O. #: 11343-606-001-9999-00
Date Received: 04-03-2003

SEMIVOLATILE

Six (6) soil samples were collected on 04-01-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 04-04-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-09,10-2003.

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. All surrogate recoveries were within EPA QC limits.

5. Three (3) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.

6. Two (2) of eleven (11) blank spike recoveries were outside EPA QC limits.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than 2x the CRQL.

8. Internal standard area and retention time criteria were met.

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

04-11-03
Date

som\group\data\bna\tnu-hanford-0304-105.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 9 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-022	Page 1 of 1

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: Air Quality ☐ 7 days — 21 Days
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system	SAF No.: B01-054	
Ice Chest No.: ERC 96 050	Field Logbook No.: EL-1573 — COA: R607BA2F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030176	Bill of Lading/Air Bill No.: SFE 05 P C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000019

Preservation			Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container			G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)			1	10 DW 7	1	1	1	1	1	1		
Volume			120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS			See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No.	Matrix *	Sample Date	Sample Time									
J00KV3	SOIL	4/1/03	1020	✓	✓	✓	✓	✓	✓	✓	✓	
J00KV4	SOIL	↓	1040	✓	✓	✓	✓	✓	✓	✓	✓	
J00KV5	SOIL	↓	1040	✓	✓	✓	✓	✓	✓	✓	✓	
J00KV6	SOIL	↓	1134	✓	✓	✓	✓	✓	✓	✓	✓	
J00KV7	SOIL	↓	1157	✓	✓	✓	✓	✓	✓	✓	✓	

CHAIN OF POSSESSION — Sign/Print Names			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWSha DWSha	1732 4/1/03	Fridge 3A	4/1/03 1732
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF 3A	4203 0700	SJGALE	4203 0700
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
SJGALE	4203 0700	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex	4.3.03 / 0855	[illegible]	4.3.03/0855
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-108-metastable~~, Uranium-238)

DWSha 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-022	Page 1 of 1
Collector: D.Shea	Company Contact: D.Shea; Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: ~~21~~ 7 Days
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system	SAF No.: B01-054	Air Quality ☐
Ice Chest No.: ERC 96 050	Field Logbook No.: EL-1573; COA: R607BA2F00	Method of Shipment: FED EX	
Shipped To: TMA/RECRA	Offsite Property No.: A030176	Bill of Lading/Air Bill No.: SEE 03PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

000020

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		

Sample No.	Matrix *	Sample Date	Sample Time										
J00KV8	SOIL	4/1/03	1005 J00KV8	✓	✓	✓	✓	✓	✓	✓	✓		

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	DWSchen DWSchen	4/1/03 1732	Fridge 3A	4/1/03 1732
Relinquished By/Removed From	REF 3A	4203 0700	SJGALE	4203 0700
Relinquished By/Removed From	SJGALE	4203 0700	FED EX	
Relinquished By/Removed From	Fed Ex	4-3-03 /0955	[illegible]	4-3-03/0955
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			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-108-metastable~~, Uranium-238)

DWSchen 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100Bc 1607-B10			DATA PACKAGE: H2136		
VALIDATOR: HLI		LAB: LLI		DATE: 4/29/03	
CASE:			SDG: H2136		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00KV3	J00KV4	J00KV5			
J00KV6	J00KV7	J00KV8			
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: bis-2-ethyl hexyl-phthalate in blank. U4 & U6-U
& to +DL
bis-2-ethyl hexyl phthalate - in EB

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
Iinternal standard areas acceptable? ..... Yes No N/A
Internal standard retention times acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
Rresults 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: all over in V3, V4, V5, V6 + V7
8 over in V8

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries aceptable? ..... 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-B10
Subject: Radiochemistry - Data Package No. H2136-EB (SDG No. H2136)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2136-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
J00KV3	4/1/03	Soil	C	See note 1
J00KV4	4/1/03	Soil	C	See note 1
J00KV5	4/1/03	Soil	C	See note 1
J00KV6	4/1/03	Soil	C	See note 1
J00KV7	4/1/03	Soil	C	See note 1
J00KV8	4/1/03	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

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 (J00KV8) 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.

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 (J00KV4/J00KV5) 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. Twenty-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. H2136 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

Twenty-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 Incoroprated, 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

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

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

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

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

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																	
Laboratory: EB																	
Case	SDG: H2136																
Sample Number		J00KV3		J00KV4		J00KV5		J00KV6		J00KV7		J00KV8					
Remarks						Duplicate						E. Blank					
Location		1607-B10		1607-B10		1607-B10		1607-B10		1607-B10		1607-B10					
Sample Date		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03		4/1/03					
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		5.19	U	4.82	U	4.88		6.03		6.62	U	-0.614	U				
Gross beta		19.0		13.7		16.6		16.7		20.0		3.84	U				
Potassium-40		10.0		9.97		9.78		10.0		9.23		3.29					
Cobalt 60	0.05	U	U	U	U	U	U	U	U*	U	U*	U	U				
Cesium 137	0.05	0.039		0.054		U	U*	U	U*	U	U*	U	U				
Radium-226		0.345		0.361		0.379		0.313		0.365		0.130					
Radium-228		0.598		0.574		0.722		0.672		0.529		0.282					
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		0.556		0.438		0.550		0.490		0.413		0.158					
Thorium-232		0.598		0.574		0.722		0.672		0.529		0.282					
Uranium-235	1	U	U	U	U	U	U	U	U	U	U	U	U				
Uranium-238	1	U	U*	U	U*	U	U*	U	U*	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 H2136

7476-001 J00KV3

DATA SHEET

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-01	Client sample id	J00KV3
Dept sample id	7476-001	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
Received	04/03/03	Collected/Weight	04/01/03 10:20 986.8 g
% solids	96.1	Custody/SAF No	B01-054-022 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.19	4.0	5.4	10	U	93A
Gross Beta	12587-47-2	19.0	4.9	6.7	15		93B
Potassium 40	13966-00-2	10.0	2.4	0.28			GAM
Cobalt 60	10198-40-0	U		0.031	0.050	U	GAM
Cesium 137	10045-97-3	0.039	0.035	0.034	0.10		GAM
Radium 226	13982-63-3	0.345	0.10	0.059			GAM
Radium 228	15262-20-1	0.598	0.15	0.11			GAM
Europium 152	14683-23-9	U		0.071	0.10	U	GAM
Europium 154	15585-10-1	U		0.085	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Thorium 228	14274-82-9	0.556	0.056	0.052			GAM
Thorium 232	TH-232	0.598	0.15	0.11			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		3.4		U	GAM
Americium 241	14596-10-2	U		0.029		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RPV 4/24/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2136

7476-002 J00KV4

DATA SHEET

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-02	Client sample id	J00KV4
Dept sample id	7476-002	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
Received	04/03/03	Collected/Weight	04/01/03 10:40 910.4 g
% solids	95.2	Custody/SAF No	B01-054-022 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.82	4.1	4.9	10	U	93A
Gross Beta	12587-47-2	13.7	4.8	7.0	15		93B
Potassium 40	13966-00-2	9.97	2.3	0.26			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	0.054	0.029	0.030	0.10		GAM
Radium 226	13982-63-3	0.361	0.16	0.052			GAM
Radium 228	15262-20-1	0.574	0.14	0.11			GAM
Europium 152	14683-23-9	U		0.061	0.10	U	GAM
Europium 154	15585-10-1	U		0.080	0.10	U	GAM
Europium 155	14391-16-3	U		0.079	0.10	U	GAM
Thorium 228	14274-82-9	0.438	0.063	0.033			GAM
Thorium 232	TH-232	0.574	0.14	0.11			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Americium 241	14596-10-2	U		0.11		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RBL
4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2136

7476-003 J00KV5

DATA SHEET

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-03	Client sample id	J00KV5
Dept sample id	7476-003	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
Received	04/03/03	Collected/Weight	04/01/03 10:40 936.2 g
% solids	95.2	Custody/SAF No	B01-054-022 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.88	3.6	4.1	10		93A
Gross Beta	12587-47-2	16.6	4.4	6.0	15		93B
Potassium 40	13966-00-2	9.78	0.86	0.44			GAM
Cobalt 60	10198-40-0	U		0.050	0.050	U	GAM
Cesium 137	10045-97-3	U		0.064	0.10	U	GAM
Radium 226	13982-63-3	0.379	0.084	0.091			GAM
Radium 228	15262-20-1	0.722	0.21	0.20			GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.550	0.052	0.047			GAM
Thorium 232	TH-232	0.722	0.21	0.20			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		5.6		U	GAM
Americium 241	14596-10-2	U		0.099		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RPB
4/24/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2136

7476-004 J00KV6

DATA SHEET

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-04	Client sample id	J00KV6
Dept sample id	7476-004	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
Received	04/03/03	Collected/Weight	04/01/03 11:34 925.4 g
% solids	95.6	Custody/SAF No	B01-054-022 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	6.03	4.0	4.8	10		93A
Gross Beta	12587-47-2	16.7	5.6	8.3	15		93B
Potassium 40	13966-00-2	10.0	2.8	0.75			GAM
Cobalt 60	10198-40-0	U		0.069	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	0.313	0.16	0.15			GAM
Radium 228	15262-20-1	0.672	0.24	0.22			GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.21	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Thorium 228	14274-82-9	0.490	0.072	0.074			GAM
Thorium 232	TH-232	0.672	0.24	0.22			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		8.0		U	GAM
Americium 241	14596-10-2	U		0.069		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RBC
4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2136

7476-005 J00KV7

DATA SHEET

SDG	7476	Client/Case no	Hanford	SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304022-05	Client sample id	J00KV7	
Dept sample id	7476-005	Location/Matrix	100 BC, 1607-B-10 Septic	SOLID
Received	04/03/03	Collected/Weight	04/01/03 11:57	933.8 g
% solids	95.7	Custody/SAF No	B01-054-022	B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	6.62	4.2	5.4	10		93A
Gross Beta	12587-47-2	20.0	5.0	6.7	15		93B
Potassium 40	13966-00-2	9.23	2.4	0.53			GAM
Cobalt 60	10198-40-0	U		0.074	0.050	U	GAM
Cesium 137	10045-97-3	U		0.079	0.10	U	GAM
Radium 226	13982-63-3	0.365	0.18	0.12			GAM
Radium 228	15262-20-1	0.529	0.26	0.26			GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.413	0.082	0.070			GAM
Thorium 232	TH-232	0.529	0.26	0.26			GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		6.7		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RBC
4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2136

7476-006 J00KV8

DATA SHEET

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-06	Client sample id	J00KV8
Dept sample id	7476-006	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
Received	04/03/03	Collected/Weight	04/01/03 10:03 926.9 g
% solids	100.0	Custody/SAF No	B01-054-022 B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.614	1.9	3.8	10	U	93A
Gross Beta	12587-47-2	3.84	4.1	6.5	15	U	93B
Potassium 40	13966-00-2	3.29	0.48	0.25			GAM
Cobalt 60	10198-40-0	U		0.047	0.050	U	GAM
Cesium 137	10045-97-3	U		0.033	0.10	U	GAM
Radium 226	13982-63-3	0.130	0.060	0.066			GAM
Radium 228	15262-20-1	0.282	0.15	0.15			GAM
Europium 152	14683-23-9	U		0.080	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.074	0.10	U	GAM
Thorium 228	14274-82-9	0.158	0.044	0.049			GAM
Thorium 232	TH-232	0.282	0.15	0.15			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		3.8		U	GAM
Americium 241	14596-10-2	U		0.072		U	GAM

100 B/C Area Effluent Pipe. & Prox.

RBC
4/29/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2136 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-10 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 10, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on April 10, 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 Mannion

Melissa C. Mannion
Program Manager

4/14/3

Date

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-054-022	Page 1 of 2

Collector: D.Shea	Company Contact: D.Shea — Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8L — Data Turnaround: 21 Days
Project Designation: 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location: 100 BC, 1607-B-10 Septic system H2136 (7476)	SAF No.: B01-054	Air Quality: ☐ 7 days
Ice Chest No.: ERC 99 041	Field Logbook No.: EL-1573 — COA: R607BA2F00	Method of Shipment: FED EX	
Shipped To: (TMA) RECRA	Offsite Property No.: A030191	Bill of Lading/Air Bill No.: SFE 05 P C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	120mL	120mL	60mL	250g	120g	60mL	500mL	60mL		
SAMPLE ANALYSIS	See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha; Gross Beta		
Sample No. / Matrix * / Sample Date / Sample Time										
J00KV3 / SOIL / 4/1/03 / 1020	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV4 / SOIL / ↓ / 1040	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV5 / SOIL / ↓ / 1040	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV6 / SOIL / ↓ / 1134	✓	✓	✓	✓	✓	✓	✓	✓		
J00KV7 / SOIL / ↓ / 1157	✓	✓	✓	✓	✓	✓	✓	✓		

DAD 4203

J00000

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DWSha DWSha	1732 4/1/03	Fridge 3A	4/1/03 1732
REF 3A 4203	0700	SJGALE	4203 0700
SJGALE	4203 0700	FED EX	
FED PX			4-3-03 1000

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-metastable~~, Uranium-238}

DWSha 3/31/03

Personnel not available to relinquish samples from the 3728 Ref# 3A on 4/2/03

Matrix: S=Soil, SE=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum, DL=Drum, T=Tissue, Wi=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION: Received By — Title — Date/Time

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-054-022	Page 2 of 2
Collector D.Shea	Company Contact D.Shea	Telephone No. 521-6014	Project Coordinator KESSNER, JH	Price Code 8L / Data Turnaround ~~21~~ Days
Project Designation 100 B/C Area Effluent Pipeline & Proximity Site Remediatio	Sampling Location 100 BC, 1607-B-10 Septic system H2136 (7476)		SAF No. B01-054	Air Quality 7days
Ice Chest No. ERC 99 041	Field Logbook No. EL-1573	COA R607BA2F00	Method of Shipment FED EX	
Shipped To TMA/RECRA	Offsite Property No. A030191		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation			Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
Type of Container			G/P	G/P	G/P	aG	aG	aG	G/P	G/P	
No. of Container(s)			1	1	1	1	1	1	1	1	
Volume			120mL	120mL	60mL	250g	120g	60mL	500mL	60mL	
SAMPLE ANALYSIS			See item (1) in Special Instructions.	ICP Metals - 6010A (Add-on) (Chromium, Lead); Mercury - 7471 - (CV)	Chromium - 7196	Semi-VOA - 8270A (TCL)	Pesticides - 8081	PCBs - 8082	See item (2) in Special Instructions	Gross Alpha; Gross Beta	
Sample No.	Matrix *	Sample Date	Sample Time								
J00KV8	SOIL	4/1/03	1005 J00KV8	✓	✓	✓	✓	✓	✓	✓	✓

4203

020000

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	4/1/03 1732	Friday 3A	4/1/03 1732
REF 3A	4203 0700	S.GALE [signature]	4203 0700
S.GALE [signature]	4203 0700	FED EX	
FED EX		[signature]	4-3-03 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-108-metastable~~, Uranium-238)

[signature] 3/31/03

Personnel not available to relinquish samples from the 3728 Ref # 3A on 4/2/03

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

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

PHLEF 011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 1607-B10			DATA PACKAGE: #2136		
VALIDATOR: TLI		LAB: EB		DATE: 4/29/03	
CASE:			SDG: H2136		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J00KU3 J00KU4 J00KU5 J00KU6					
J00KU7 J00KU8					
					soil

1. Completeness ..... ☒ N/A

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

Comments: _____

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

Instruments/detectors calibrated? ..... Yes No N/A

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

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

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

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

Comments: _____

3. Continuing Calibration (Levels D, E) ..... ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

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

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

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

Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

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

Background Counts acceptable? ..... Yes No N/A

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

Comments: _____

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, Ra 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

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 PAS or FS

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: ~~HS/Tower~~ 5/3/05 21 cre

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2136

7476-008 Method Blank

METHOD BLANK

SDG	7476	Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304022-08	Client sample id	Method Blank
Dept sample id	7476-008	Material/Matrix	SOLID
		SAF No	B01-054

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.602	1.4	3.0	10	U	93A
Gross Beta	12587-47-2	-0.446	3.9	6.7	15	U	93B
Potassium 40	13966-00-2	U		1.6		U	GAM
Cobalt 60	10198-40-0	U		0.074	0.050	U	GAM
Cesium 137	10045-97-3	U		0.056	0.10	U	GAM
Radium 226	13982-63-3	U		0.12		U	GAM
Radium 228	15262-20-1	U		0.25		U	GAM
Europium 152	14683-23-9	U		0.13	0.10	U	GAM
Europium 154	15585-10-1	U		0.15	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	U		0.077		U	GAM
Thorium 232	TH-232	U		0.25		U	GAM
Uranium 235	15117-96-1	U		0.22		U	GAM
Uranium 238	U-238	U		6.8		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

100 B/C Area Effluent Pipe. & Prox.

QC-BLANK 44302

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/10/03

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2136

7476-007 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7476
Contact Melissa C. Mannion
Client/Case no Hanford SDG H2136
Contract No. 630

Lab sample id R304022-07
Dept sample id 7476-007
Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-054

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	190	14	3.1	10		93A	214	8.6	89	71-129	70-130
Gross Beta	214	11	7.9	15		93B	232	9.3	92	77-123	70-130
Cobalt 60	4.99	0.22	0.083	0.050		GAM	5.32	0.21	94	77-123	80-120
Cesium 137	4.95	0.18	0.090	0.10		GAM	5.07	0.20	98	77-123	80-120

100 B/C Area Effluent Pipe. & Prox.

QC-LCS 44301

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2136

7476-009 J00KV5

DUPLICATE

SDG	7476			Client/Case no	Hanford SDG H2136
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R304022-09	Lab sample id	R304022-03	Client sample id	J00KV5
Dept sample id	7476-009	Dept sample id	7476-003	Location/Matrix	100 BC, 1607-B-10 Septic SOLID
		Received	04/03/03	Collected/Weight	04/01/03 10:40 936.2 g
% solids	95.2	% solids	95.2	Custody/SAF No	B01-054-022 B01-054

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	3.17	3.2	4.1	10	U	93A	4.88	3.6	4.1		42	185
Gross Beta	17.9	4.5	6.0	15		93B	16.6	4.4	6.0		8	63
Potassium 40	9.81	1.6	1.3			GAM	9.78	0.86	0.44		0	42
Cobalt 60	U		0.091	0.050	U	GAM	U		0.050	U	-	
Cesium 137	U		0.089	0.10	U	GAM	U		0.064	U	-	
Radium 226	0.510	0.17	0.18			GAM	0.379	0.084	0.091		29	72
Radium 228	0.462	0.34	0.42			GAM	0.722	0.21	0.20		44	106
Europium 152	U		0.21	0.10	U	GAM	U		0.11	U	-	
Europium 154	U		0.28	0.10	U	GAM	U		0.16	U	-	
Europium 155	U		0.19	0.10	U	GAM	U		0.11	U	-	
Thorium 228	0.558	0.12	0.14			GAM	0.550	0.052	0.047		1	48
Thorium 232	0.462	0.34	0.42			GAM	0.722	0.21	0.20		44	106
Uranium 235	U		0.32		U	GAM	U		0.14	U	-	
Uranium 238	U		11		U	GAM	U		5.6	U	-	
Americium 241	U		0.20		U	GAM	U		0.099	U	-	

100 B/C Area Effluent Pipe. & Prox.

QC-DUP#3 44303

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/10/03