0060115

SAF-B03-015
Remaining Sites Confirmation Sampling-Soil
FINAL VALIDATION PACKAGE

MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan 6.19.03
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE COVER SHEET)

SDG H2236 SAF-B03-015

Sample Location/Waste Site: 600-190

RECEIVED
AUG 18 2003
EDMC

Date: 12 June 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil-
Waste Site 600-190
Subject: Inorganics - Data Package No. H2236-LLI (SDG No. H2236)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2236-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Waste Site	Analysis
J00P15	5/20/03	Soil	C	600-190	See note 1
J00P16	5/20/03	Soil	C	600-190	See note 1
J00P17	5/20/03	Soil	C	600-190	See note 1
J00P18	5/20/03	Soil	C	600-190	See note 1
J00P19	5/20/03	Soil	C	600-190	See note 1

1 - ICP metals; mercury by 7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and 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 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

Due to preparation blank contamination, the chromium and lead results in sample J00P19 were qualified as undetected and flagged "U".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00P19) was submitted for analysis. Barium, chromium and lead were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike

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

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J00P17/J00P18) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RDLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific RDL.

- **Completeness**

Data package No. H2236-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 preparation blank contamination, the chromium and lead results in sample J00P19 were qualified as undetected and flagged "U".

REFERENCES

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

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

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: H2236	REVIEWER: TLI	DATE: 6/12/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium Lead	U	J00P19	Method blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD											
Laboratory: LLI											
Case	SDG: H2236										
Sample Number		J00P15		J00P16		J00P17		J00P18		J00P19	
Remarks								Duplicate		E. Blank	
Location		600-190		600-190		600-190		600-190		600-190	
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03	
Inorganics	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.12	U	0.11	U	0.11	U	0.12	U	0.12	U
Arsenic		1.8		2.2		2.5		2.4		0.32	U
Barium	20	66.0		67.8		65.8		81.5		0.86	
Cadmium	0.2	0.04	U	0.12		0.04	U	0.06		0.04	U
Chromium (total)	1	12.1		13.8		13.1		13.8		0.24	U
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.01	U
Lead	5	4.7		10.8		4.0		4.0		0.40	U
Selenium	1	0.41	U	0.38	U	0.40	U	0.41	U	0.41	U

000010

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00P15	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	1.8	MG/KG	0.33	1.0
		Barium, Total	66.0	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	12.1	MG/KG	0.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.7	MG/KG	0.23	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0
-002	J00P16	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.2	MG/KG	0.30	1.0
		Barium, Total	67.8	MG/KG	0.02	1.0
		Cadmium, Total	0.12	MG/KG	0.04	1.0
		Chromium, Total	13.8	MG/KG	0.09	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	10.8	MG/KG	0.21	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
-003	J00P17	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.5	MG/KG	0.32	1.0
		Barium, Total	65.8	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	13.1	MG/KG	0.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.22	1.0
		Selenium, Total	0.40 u	MG/KG	0.40	1.0
-004	J00P18	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	2.4	MG/KG	0.32	1.0
		Barium, Total	81.5	MG/KG	0.02	1.0
		Cadmium, Total	0.06	MG/KG	0.04	1.0
		Chromium, Total	13.8	MG/KG	0.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.22	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0

6/10/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J00P19	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Barium, Total	0.86	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.24 U	MG/KG	0.1	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	0.40 U	MG/KG	0.22	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0

6/10/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL#: 0305L472
SDG/SAF#: H2236/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 05-22-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 5 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 (80-120% for Mercury).

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

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

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within 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.

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

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 22 pages.

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

6/2/03
Date

jjw/m05-472

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-111	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: AC30236	Bill of Lading/Air Bill No.: 3EE 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area. No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000016

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1					
Volume	60mL	250mL	125g	60mL	60mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1					

Sample No.	Matrix *	Sample Date	Sample Time										
J00P15	SOIL	5-20-03	1730	X	X	X			X				
J00P16	SOIL	5-20-03	1700	X	X	X			X				

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	5-20-03/1575	Ref 3A 3728	5-20-03/1415
Ref 3A 3728	52103 1300	S J Galle	52103 1300
S J Galle	52103 1300	FED EX	
Fed Ex	5-22-03 0900	D Smith	5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-114	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 96002	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: 565 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125g	60mL	60mL	125mL	125mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	Sulfides - 9030	Total Cyanide - 9010			
Sample No.	Matrix *	Sample Date	Sample Time								
J00P17	SOIL	5-20-03	1410	X	X	X		X	X	X	
J00P18	SOIL	5-20-03	1410	X	X	X		X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers DL Bowers	5-20-03 / 1515	Ref 3A 3728	5-20-03 / 1515
REF 3A 3728	52103 1300	S J GALE	52103 1300
S. J GALE	52103 1300	FED EX	
FED EX	5-22-03 10:00	D. Smith	5-22-03 0600

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

Matrix *
S=Soil
SB=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	Disposal Method	Disposed By	Date/Time

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-112	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

Preservation	None	Cool 4C	Cool 4C									
Type of Container	aG	aG	aG									
No. of Container(s)	1	1	1									
Volume	60mL	125g	60mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL) KTB 5-20-									
Sample No.	Matrix *	Sample Date	Sample Time									
J00P19	SOIL	5-20-03	1350	X	X							

000018

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DL Bowers	5-20-03/1515	REF 3A 3728	5-20-03/1515
REF 3A 3728	52103 1300	SJOALL	52103 1300
SJOALL	52103 1300	FEDEX	
Fed Ex	5-22-03/0900		5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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

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

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-196		DATA PACKAGE:	H2236	
VALIDATOR:	TLI	LAB:	LLI	DATE:	6/9/03
CASE:			SDG:	H2236	

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J00P15 J00P16 J00P17 J00P18 J00P19

Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: P19 – U chromium + lead blank

barium, chromium + lead in eb

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

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

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

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

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

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

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

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

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

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

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

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

Comments: NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments:

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0295-MB1	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.12	MG/KG	0.10	1.0
		Lead, Total	0.42	MG/KG	0.23	1.0
		Selenium, Total	0.42 u	MG/KG	0.42	1.0
BLANK1	03C0125-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236

LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00P15	Silver, Total	4.7	0.12u	4.9	95.9	1.0
		Arsenic, Total	191	1.8	197	95.6	1.0
		Barium, Total	245	66.0	197	90.7	1.0
		Cadmium, Total	4.8	0.04u	4.9	98.0	1.0
		Chromium, Total	31.6	12.1	19.7	99.0	1.0
		Mercury, Total	0.17	0.02u	0.16	104.4	1.0
		Lead, Total	52.9	4.7	49.3	97.8	1.0
		Selenium, Total	172	0.41u	197	87.1	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00P15	Silver, Total	0.12u	0.12u	NC	1.0
		Arsenic, Total	1.8	2.2	20.0	1.0
		Barium, Total	66.0	65.4	0.91	1.0
		Cadmium, Total	0.04u	0.04u	NC	1.0
		Chromium, Total	12.1	14.1	15.3	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	4.7	4.8	2.1	1.0
		Selenium, Total	0.41u	0.41u	NC	1.0

RECEIVED
JUN 2003

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2236

DATE RECEIVED: 05/22/03 LVL LOT # :0305L472

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00P15						
SILVER, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
SILVER, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
SILVER, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
MERCURY, TOTAL	001	S	03C0125	05/20/03	05/27/03	05/27/03
MERCURY, TOTAL	001 REP	S	03C0125	05/20/03	05/27/03	05/27/03
MERCURY, TOTAL	001 MS	S	03C0125	05/20/03	05/27/03	05/27/03
LEAD, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
LEAD, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
LEAD, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	001	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	001 REP	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	001 MS	S	03L0295	05/20/03	05/27/03	05/29/03
J00P16						
SILVER, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
MERCURY, TOTAL	002	S	03C0125	05/20/03	05/27/03	05/27/03
LEAD, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	002	S	03L0295	05/20/03	05/27/03	05/29/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2236

DATE RECEIVED: 05/22/03 LVL LOT # :0305L472

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00P17						
SILVER, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
MERCURY, TOTAL	003	S	03C0125	05/20/03	05/27/03	05/27/03
LEAD, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	003	S	03L0295	05/20/03	05/27/03	05/29/03
J00P18						
SILVER, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
MERCURY, TOTAL	004	S	03C0125	05/20/03	05/27/03	05/27/03
LEAD, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	004	S	03L0295	05/20/03	05/27/03	05/29/03
J00P19						
SILVER, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
ARSENIC, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
BARIUM, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
CADMIUM, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
CHROMIUM, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
MERCURY, TOTAL	005	S	03C0125	05/20/03	05/27/03	05/27/03
LEAD, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03
SELENIUM, TOTAL	005	S	03L0295	05/20/03	05/27/03	05/29/03

LAB QC:

SILVER LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
SILVER, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2236

DATE RECEIVED: 05/22/03 LVL LOT # :0305L472

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
ARSENIC, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03
BARIUM LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
BARIUM, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03
CADMIUM LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
CADMIUM, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03
CHROMIUM LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
CHROMIUM, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03
MERCURY LABORATORY	LC1 BS	S	03C0125	N/A	05/27/03	05/27/03
MERCURY, TOTAL	MB1	S	03C0125	N/A	05/27/03	05/27/03
LEAD LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
LEAD, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03
SELENIUM LABORATORY	LC1 BS	S	03L0295	N/A	05/27/03	05/28/03
SELENIUM, TOTAL	MB1	S	03L0295	N/A	05/27/03	05/28/03

Date: 12 June 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 600-190
Subject: Wet Chemistry - Data Package No. H2236-LLI (SDG No. H2236)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2236-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Waste Site	Analysis
J00P15	5/20/03	Soil	C	600-190	See note 1
J00P16	5/20/03	Soil	C	600-190	See note 1
J00P17	5/20/03	Soil	C	600-190	See note 1
J00P18	5/20/03	Soil	C	600-190	See note 1
J00P19	5/20/03	Soil	C	600-190	See note 1

1 - Petroleum hydrocarbons by 9071.
2 - Cyanide (total by 9010B and sulfide by 9030B.
3 - No validated analytes.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work 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 are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as

follows: Soil samples must be analyzed within 28 days for petroleum hydrocarbons, 14 days for cyanide and 7 days for sulfide.

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

All holding times were acceptable.

- **Method Blanks**

Method Blanks

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

All method blank results were acceptable.

Field (Equipment) Blank

The field blank contained no validated analytes.

- **Accuracy**

Matrix Spike

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

All matrix spike 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 duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J00P17/J00P18) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All results met the analyte specific RQL.

- **Completeness**

Data package No. H2236-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

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: H2236	REVIEWER: TLI	DATE: 6/12/03	PAGE_1_OF_1_
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD											
Laboratory: LLJ											
Case	SDG: H2236										
Sample Number		J00P15		J00P16		J00P17		J00P18		J00P19	
Remarks								Duplicate		E. Blank	
Location		600-190		600-190		600-190		600-190		600-190	
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03	
Wet Chemistry	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Petroleum Hydrocarbons	5	5.0		24.8		3.4	U	3.8		NA	
Cyanide		NA		NA		0.28	U	0.43	U	NA	
Sulfide						24.6	U	23.9	U	NA	

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.

INORGANICS DATA SUMMARY REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00P15	% Solids	94.7		%	0.01	1.0
		Petroleum Hydrocarbons	5.0		MG/KG	3.5	1.0
-002	J00P16	% Solids	96.1		%	0.01	1.0
		Petroleum Hydrocarbons	24.8		MG/KG	3.5	1.0
-003	J00P17	% Solids	96.6		%	0.01	1.0
		Cyanide, Total	0.28	u	MG/KG	0.28	1.0
		Petroleum Hydrocarbons	3.4	u	MG/KG	3.4	1.0
		Sulfide	24.6	u	MG/KG	24.6	1.0
-004	J00P18	% Solids	96.2		%	0.01	1.0
		Cyanide, Total	0.43	u	MG/KG	0.43	1.0
		Petroleum Hydrocarbons	3.8		MG/KG	3.5	1.0
		Sulfide	23.9	u	MG/KG	23.9	1.0
-005	J00P19	% Solids	100		%	0.01	1.0

6/10/03

06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015 H2236
LVL#: 0305L472

W.O.#: 11343-606-001-9999-00
Date Received: 05-22-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 5 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Total Cyanide, Sulfide, and Petroleum Hydrocarbons (PHC) were within the 75-125% control limits. The matrix spike duplicate for PHC was within the 20% Relative Percent Difference (RPD) control limit.

8. The replicate analyses for Total Cyanide and Sulfide were within the 20% 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

6/2/03
Date

njp\i05-472

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-111	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: 365 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000014

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1					
Volume	60mL	250mL	125g	60mL	60mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1					

Sample No.	Matrix *	Sample Date	Sample Time										
J00P15	SOIL	5-20-03	1310	X	X	X		X					
J00P16	SOIL	5-20-03	1300	X	X	X		X					

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	5-20-03/1575	Ref 3A 3728	5-20-03/1575
Ref 3A 3728	52103 1300	SJ Galindo	52103 1300
SJ Galindo	52103 1300	FED EX	
Fed Ex	5-22-03/0900	D Smith	5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-114	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 96002	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000015

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125g	60mL	60mL	125mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	Sulfides - 9030	Total Cyanide - 9010			

Sample No.	Matrix *	Sample Date	Sample Time										
J00P17	SOIL	5-20-03	1410	X	X	X		X	X	X			
J00P18	SOIL	5-20-03	1410	X	X	X		X	X	X			

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DL Bowers / Doug Bowers	5-20-03 / 1515	Ref 3A 3728	5-20-03 / 1515
Ref 3A 3728	52103 1300	S J Gale	52103 1300
S J Gale	52103 1300	FED EX	
Fed Ex	5-22-03 / 0900	D Smith	5-22-03 / 0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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)

15

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-112	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

Preservation	None	Cool 4C	Cool 4C									
Type of Container	aG	aG	aG									
No. of Container(s)	1	1	1									
Volume	60mL	125g	60mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)									

000016

Sample No.	Matrix *	Sample Date	Sample Time											
J00P19	SOIL	5-20-03	1350	X	X									

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DL Bowers	5-20-03/1515	REF 3A 3728	5-20-03/1515
REF 3A 3728	52103 1300	SJOALL	52103 1300
SJOALL	52103 1300	FEDEX	
Fed Ex	5-22-03/0900		5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	L00-190		DATA PACKAGE:	H2236	
VALIDATOR:	TLI	LAB:	LLI	DATE:	6/9/03
CASE:			SDG:	H2236	

ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate	TPH	
Cyanide	Sulfide				

SAMPLES/MATRIX					
J00P15	J00P16	J00P17	J00P18	J00P19	
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

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

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

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

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

Comments: No validated analyte in the PB

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

Spike samples analyzed? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

Comments: No PAS

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

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

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

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

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

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. 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:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LHC027-MB1	Petroleum Hydrocarbons	3.3 u	MG/KG	3.3	1.0
BLANK1	03LC048-MB1	Cyanide, Total	0.50 u	MG/KG	0.50	1.0
BLANK10	03LSD024-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J00P15	Petroleum Hydrocarbons	142	5.0	147	92.9	1.0
		Petroleum Hydrocarbons	146	5.0	147	95.5	1.0
-004	J00P18	Cyanide, Total	4.09	0.43u	4.30	95.1	1.0
		Sulfide	319	23.9u	339	90.8	1.0
LCS10	03LHC027-LC1	Petroleum Hydrocarbons	125	3.3 u	140	89.6	1.0
BLANK10	03LSD024-MB1	Sulfide	523	40.0 u	541	96.5	1.0

08

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	J00P15	Petroleum Hydrocarbons	92.9	95.5	2.7

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/30/03

CLIENT: TNUHANFORD B03-015 H2236 LVL LOT #: 0305L472

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-004REP	J00P18	Cyanide, Total	0.43u	0.42u	NC	1.0
		Sulfide	23.9 u	28.8 u	NC	1.0

RECEIVED
JUN 2003

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2236

DATE RECEIVED: 05/22/03 LVL LOT # :0305L472

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00P15						
% SOLIDS	001	S	03L%S071	05/20/03	05/23/03	05/24/03
PETROLEUM HYDROCARBO	001	S	03LHC027	05/20/03	05/27/03	05/28/03
PETROLEUM HYDROCARBO	001 MS	S	03LHC027	05/20/03	05/27/03	05/28/03
PETROLEUM HYDROCARBO	001 MSD	S	03LHC027	05/20/03	05/27/03	05/28/03
J00P16						
% SOLIDS	002	S	03L%S071	05/20/03	05/23/03	05/24/03
PETROLEUM HYDROCARBO	002	S	03LHC027	05/20/03	05/27/03	05/28/03
J00P17						
% SOLIDS	003	S	03L%S071	05/20/03	05/23/03	05/24/03
TOTAL CYANIDE	003	S	03LC048	05/20/03	05/27/03	05/27/03
PETROLEUM HYDROCARBO	003	S	03LHC027	05/20/03	05/27/03	05/28/03
SULFIDE	003	S	03LSD024	05/20/03	05/27/03	05/28/03
J00P18						
% SOLIDS	004	S	03L%S071	05/20/03	05/23/03	05/24/03
TOTAL CYANIDE	004	S	03LC048	05/20/03	05/27/03	05/27/03
TOTAL CYANIDE	004 REP	S	03LC048	05/20/03	05/27/03	05/27/03
TOTAL CYANIDE	004 MS	S	03LC048	05/20/03	05/27/03	05/27/03
PETROLEUM HYDROCARBO	004	S	03LHC027	05/20/03	05/27/03	05/28/03
SULFIDE	004	S	03LSD024	05/20/03	05/27/03	05/28/03
SULFIDE	004 REP	S	03LSD024	05/20/03	05/27/03	05/28/03
SULFIDE	004 MS	S	03LSD024	05/20/03	05/27/03	05/28/03
J00P19						
% SOLIDS	005	S	03L%S071	05/20/03	05/23/03	05/24/03

LB QC:

PETROLEUM HYDROCARBO	LC1 BS	S	03LHC027	N/A	05/27/03	05/28/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-015 H2236

DATE RECEIVED: 05/22/03 LVL LOT # :0305L472

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PETROLEUM HYDROCARBO	MB1	S	03LHC027	N/A	05/27/03	05/28/03
TOTAL CYANIDE	LCS L	S	03LC048	N/A	05/27/03	05/27/03
TOTAL CYANIDE	LCS L	S	03LC048	N/A	05/27/03	05/27/03
TOTAL CYANIDE	MB1	S	03LC048	N/A	05/27/03	05/27/03
SULFIDE	MB1	S	03LSD024	N/A	05/27/03	05/28/03
SULFIDE	MB1 BS	S	03LSD024	N/A	05/27/03	05/28/03

02

Date: 12 June 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 600-190
Subject: PCB/Pesticides/Herbicides - Data Package No. H2236-LLI (SDG No. H2236)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2236-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Waste Site	Analysis
J00P15	5/20/03	Soil	C	600-190	See note 1
J00P16	5/20/03	Soil	C	600-190	See note 1
J00P17	5/20/03	Soil	C	600-190	See note 1
J00P18	5/20/03	Soil	C	600-190	See note 1

1 - PCBs by 8082; pesticides by 8081A; herbicides by 8151A

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work 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 quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank target compound results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike

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.

Due to the matrix spike and matrix spike duplicate being diluted out, all PCB and pesticide results were qualified as estimates and flagged "J".

Due to MS/MSD recoveries below QC limits, all herbicide results except dinoseb were qualified as estimates and flagged "J".

All other 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.

Due to the surrogates being diluted out, all PCB pesticide results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to the matrix spike and matrix spike duplicate being diluted out, all PCB and pesticide results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (32%), all 2,4,5-TP(Silvex) results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J00P17/J00P18) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported results exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H2236-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 an RPD outside QC limits (32%), all 2,4,5-TP(Silvex) results were qualified as estimates and flagged "J". Due to MS/MSD recoveries below QC limits, all herbicide results except dinoseb were qualified as estimates and flagged "J". Due to the matrix spike and matrix spike duplicate being diluted out, all PCB and pesticide results were qualified as estimates and flagged "J". Due to the surrogates being diluted out, all PCB and pesticide results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All reported results exceeded the analyte specific RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

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

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: H2236	REVIEWER: TLI	DATE: 6/12/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All herbicides except dinoseb	J	All	Low MS/MSD recovery
2,4,5-TP(Silvex)	J	All	RPD
Pesticides PCBs	J	All	MS/MSD and surrogate diluted out.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD													
Laboratory: Lionville Laboratory Inc.													
Case:	SDG: H2236												
Sample Number		J00P15		J00P16		J00P17		J00P18					
Remarks								Duplicate					
Location		600-190		600-190		600-190		600-190					
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03					
Extraction Date		5/26/03		5/26/03		5/26/03		5/26/03					
Analysis Date		5/29/03		5/29/03		5/29/03		5/29/03					
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	160	UJ	160	UJ	160	UJ	160	UJ				
Aroclor-1221	20	160	UJ	160	UJ	160	UJ	160	UJ				
Aroclor-1232	20	160	UJ	160	UJ	160	UJ	160	UJ				
Aroclor-1242	20	160	UJ	160	UJ	160	UJ	160	UJ				
Aroclor-1248	20	160	UJ	160	UJ	160	UJ	160	UJ				
Aroclor-1254	20	1100	J	160	UJ	160	UJ	160	UJ				
Aroclor-1260	20	160	UJ	130	J	160	UJ	160	UJ				
Sample Number		J00P15		J00P16		J00P17		J00P18					
Remarks								Duplicate					
Location		600-190		600-190		600-190		600-190					
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03					
Extraction Date		5/26/03		5/26/03		5/26/03		5/26/03					
Analysis Date		5/28/03		5/28/03		5/29/03		5/29/03					
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	88	UJ	87	UJ	86	UJ	87	UJ				
Beta-BHC	5	88	UJ	87	UJ	86	UJ	87	UJ				
Delta-BHC	5	88	UJ	87	UJ	86	UJ	87	UJ				
Gamma-BHC (Lindane)	5	88	UJ	87	UJ	86	UJ	87	UJ				
Heptachlor	5	88	UJ	87	UJ	86	UJ	87	UJ				
Aldrin	5	88	UJ	87	UJ	86	UJ	87	UJ				
Heptachlor Epoxide	5	88	UJ	87	UJ	86	UJ	87	UJ				
Endosulfan I	5	88	UJ	87	UJ	86	UJ	87	UJ				
Dieldrin	5	180	UJ	170	UJ	170	UJ	170	UJ				
4,4'-DDE	5	180	UJ	170	UJ	170	UJ	170	UJ				
Endrin	5	180	UJ	170	UJ	170	UJ	170	UJ				
Endosulfan II	5	180	UJ	170	UJ	170	UJ	170	UJ				
4,4'-DDD	5	180	UJ	170	UJ	170	UJ	170	UJ				
Endosulfan Sulfate	5	180	UJ	170	UJ	170	UJ	170	UJ				
4,4'-DDT	5	180	UJ	170	UJ	170	UJ	170	UJ				
Methoxychlor	5	880	UJ	870	UJ	860	UJ	870	UJ				
Endrin Ketone	5	180	UJ	170	UJ	170	UJ	170	UJ				
Endrin Aldehyde	5	180	UJ	170	UJ	170	UJ	170	UJ				
alpha-Chlordane	5	88	UJ	87	UJ	86	UJ	87	UJ				
gamma-Chlordane	5	88	UJ	87	UJ	86	UJ	87	UJ				
Toxaphene	5	8800	UJ	8700	UJ	8600	UJ	8700	UJ				

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.

NA - Not analyzed

000011

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD													
Laboratory: Lionville Laboratory Inc.													
Case:	SDG: H2236												
Sample Number		J00P15		J00P16		J00P17		J00P18					
Remarks								Duplicate					
Location		600-190		600-190		600-190		600-190					
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03					
Extraction Date		5/25/03		5/25/03		5/25/03		5/25/03					
Analysis Date		5/28/03		5/28/03		5/28/03		5/28/03					
Herbicides	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Dalapon		180	UJ	170	UJ	170	UJ	170	UJ				
Dicamba		70	UJ	69	UJ	69	UJ	69	UJ				
Dichloroprop		180	UJ	170	UJ	170	UJ	170	UJ				
2,4-D		35	UJ	35	UJ	34	UJ	35	UJ				
2,4,5-TP (silvex)		18	UJ	17	UJ	17	UJ	17	UJ				
2,4,5-T		18	UJ	17	UJ	17	UJ	17	UJ				
2,4-DB		180	UJ	170	UJ	170	UJ	170	UJ				
Dinoseb		18	U	17	U	17	U	17	U				

000012

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.

NA - Not analyzed

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 05/29/03 19:10

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 1

	Cust ID:	J00P15	J00P16	J00P16	J00P16	J00P17	J00P18
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	10.0	10.0	10.0	10.0	10.0	10.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	D %	D %	D %	D %	D %	D %
	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	D %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		160 U J	160 U J	D %	D %	160 U J	160 U J
Aroclor-1221		160 U	160 U	160 U	160 U	160 U	160 U
Aroclor-1232		160 U	160 U	160 U	160 U	160 U	160 U
Aroclor-1242		160 U	160 U	160 U	160 U	160 U	160 U
Aroclor-1248		160 U	160 U	160 U	160 U	160 U	160 U
Aroclor-1254		1100	160 U	160 U	160 U	160 U	160 U
Aroclor-1260		160 U	130 %	D %	D %	160 U	160 U

	Cust ID:	PBLKUR	PBLKUR BS
Sample Information	RFW#:	03LE0626-MB1	03LE0626-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate:	Decachlorobiphenyl	90 %	105 %
	Tetrachloro-m-xylene	80 %	90 %
		fl	fl
Aroclor-1016		15 U	105 %
Aroclor-1221		15 U	15 U
Aroclor-1232		15 U	15 U
Aroclor-1242		15 U	15 U
Aroclor-1248		15 U	15 U
Aroclor-1254		15 U	15 U
Aroclor-1260		15 U	108 %

6/10/03

6/10/03

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

000013

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 1 Report Date: 05/29/03 13:49

	Cust ID:	J00P15	J00P16	J00P16	J00P16	J00P17	J00P18
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	50.0	50.0	50.0	50.0	50.0	50.0
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	D %	D %	D %	D %	D %	D %
	Decachlorobiphenyl	D %	D %	D %	D %	D %	D %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		88 U J	87 U J	87 U	87 U	86 U J	87 U J
Beta-BHC		88 U	87 U	87 U	87 U	86 U	87 U
Delta-BHC		88 U	87 U	87 U	87 U	86 U	87 U
gamma-BHC (Lindane)		88 U	87 U	D %	D %	86 U	87 U
Heptachlor		88 U	87 U	D %	D %	86 U	87 U
Aldrin		88 U	87 U	D %	D %	86 U	87 U
Heptachlor epoxide		88 U	87 U	87 U	87 U	86 U	87 U
Endosulfan I		88 U	87 U	87 U	87 U	86 U	87 U
Dieldrin		180 U	170 U	D %	D %	170 U	170 U
4,4'-DDE		180 U	170 U	170 U	170 U	170 U	170 U
Endrin		180 U	170 U	D %	D %	170 U	170 U
Endosulfan II		180 U	170 U	170 U	170 U	170 U	170 U
4,4'-DDD		180 U	170 U	170 U	170 U	170 U	170 U
Endosulfan sulfate		180 U	170 U	170 U	170 U	170 U	170 U
4,4'-DDT		180 U	170 U	D %	D %	170 U	170 U
Methoxychlor		880 U	870 U	870 U	870 U	860 U	870 U
Endrin ketone		180 U	170 U	170 U	170 U	170 U	170 U
Endrin aldehyde		180 U	170 U	170 U	170 U	170 U	170 U
alpha-Chlordane		88 U	87 U	87 U	87 U	86 U	87 U
gamma-Chlordane		88 U	87 U	87 U	87 U	86 U	87 U
Toxaphene		8800 U	8700 U	8700 U	8700 U	8600 U	8700 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

000014

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 05/29/03 13:49

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 2

	Cust ID:	PBLKUR	PBLKUR BS
Sample Information	RFW#:	03LE0626-MB1	03LE0626-MB1
	Matrix:	SOIL	SOIL
	D.F.:	1.00	1.00
	Units:	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		90 %	95 %
Decachlorobiphenyl		115 %	115 %
Alpha-BHC		1.7 U	1.7 U
Beta-BHC		1.7 U	1.7 U
Delta-BHC		1.7 U	1.7 U
gamma-BHC (Lindane)		1.7 U	98 %
Heptachlor		1.7 U	106 %
Aldrin		1.7 U	98 %
Heptachlor epoxide		1.7 U	1.7 U
Endosulfan I		1.7 U	1.7 U
Dieldrin		3.3 U	114 %
4,4'-DDE		3.3 U	3.3 U
Endrin		3.3 U	131 * %
Endosulfan II		3.3 U	3.3 U
4,4'-DDD		3.3 U	3.3 U
Endosulfan sulfate		3.3 U	3.3 U
4,4'-DDT		3.3 U	117 %
Methoxychlor		17 U	17 U
Endrin ketone		3.3 U	3.3 U
Endrin aldehyde		3.3 U	3.3 U
alpha-Chlordane		1.7 U	1.7 U
gamma-Chlordane		1.7 U	1.7 U
Toxaphene		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

Rx 6/10/03

000015

Lionville Laboratory, Inc.
Herbicides, Special List

Report Date: 05/28/03 12:09

RFW Batch Number: 0305L472 Client: TNU-HANFORD B03-015 Work Order: 11343606001 Page: 1

	Cust ID:	J00P15	J00P15	J00P15	J00P16	J00P17	J00P18
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:	DCAA	51 %	46 %	38 %	91 %	107 %	88 %
		fl	fl	fl	fl	fl	fl
Dalapon		180 U J	32 * %	17 * %	170 U J	170 U J	170 U J
Dicamba		70 U	36 * %	25 * %	69 U	69 U	69 U
Dichloroprop		180 U	34 * %	23 * %	170 U	170 U	170 U
2,4-D		35 U	18 * %	13 * %	35 U	34 U	35 U
2,4,5-TP (Silvex)		18 U	52 %	37 * %	17 U	17 U	17 U
2,4,5-T		18 U	28 * %	19 * %	17 U	17 U	17 U
2,4-DB		180 U	42 * %	32 * %	170 U	170 U	170 U
Dinoseb		18 U	53 %	40 %	17 U	17 U	17 U

	Cust ID:	PBLKUM	PBLKUM BS	PBLKUM BSD
Sample Information	RFW#:	03LE0625-MB1	03LE0625-MB1	03LE0625-MB1
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	102 %	149 %	87 %
		fl	fl	fl
Dalapon		170 U	34 * %	29 * %
Dicamba		67 U	80 %	48 * %
Dichloroprop		170 U	82 %	62 %
2,4-D		33 U	69 %	51 %
2,4,5-TP (Silvex)		17 U	81 %	67 %
2,4,5-T		17 U	62 %	55 * %
2,4-DB		170 U	94 %	66 %
Dinoseb		17 U	84 %	50 %

6/10/03

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

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B03-015
LVL#: 0305L472
SDG/SAF#: H2236/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 05-22-03

HERBICIDE

The set of samples consisted of four (4) soil samples collected on 05-20-03.

The samples and their associated QC samples were extracted on 05-25-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-27,28-03. The extraction and analysis procedure was based on method 8151A.

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 method blank was below the reporting limits for all target compounds.

4. All obtainable surrogate recoveries were within acceptance criteria.

5. Four (4) of sixteen (16) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. Thirteen (13) of sixteen (16) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

9. To the best of my knowledge, this data report is in compliance with the terms and conditions of the purchase order, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hard copy data package and in the electronic data submitted on diskette has been authorized by the cognizant laboratory manager or his/her designee to be accurate as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

6/2/03
Date

pef\r:\group\data\herb\\tnu\05L-472.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 11 pages.

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 03GC156

Initiator: Bryce Santoro
Date: 5/28/03
Client: TUV

Batch: 03052453,454,472,473
Samples: LS, LSD, 472-MS/MSD, 454-MSD
Method: SW846/MCAWW/CLP/

Parameter: dHBOx
Matrix: Soil
Prep Batch: 03LE0685

1. Reason for SDR

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

b. General Discrepancy

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

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

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

1) Low LS and LSD recoveries (see attached).
2) Low MS and MSD recoveries in 03052472-001MS and 001MSD. (See attached).
3) High Dinoseb recovery in 03052454-004MSD

2. Known or Probable Causes(s)

2) Matrix Interference.

3. Discussion and Proposed Action Other Description:

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

narrate

4. Project Manager Instructions...signature/date: 5/29/03

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

5. Final Action...signature/date: _____ Other Explanation:

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

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

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

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0305L472
SDG/SAF #: H2236/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-03

PESTICIDE

The set of samples consisted of four (4) soil samples collected on 05-20-03.

The samples and their associated QC samples were extracted on 05-26-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-28,29-03. 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. All obtainable surrogate recoveries were within acceptance criteria.

6. One (1) of six (6) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. Matrix spike recoveries were unobtainable due to the dilution required for analysis.

8. All samples required 50-fold instrument dilutions due to the high concentrations of target and non-target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.

9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of the target compounds listed on the enclosed Sample Discrepancy Report (SDR).

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 16 pages.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/2/03
Date

pefv:\group\data\pest\mu hanford\05L-472.pcb

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 036-C158

Initiator: Bryce Santoro
Date: TUV
Client: 05/29/03

Batch: 03052472, 473
Samples: all
Method: SW846/MCAWW/CLP/

Parameter: 0608H
Matrix: Soil
Prep Batch: 03LE0626

1. Reason for SDR

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

b. General Discrepancy

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

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

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

(1) ccv prior to all 472 samples and QC and 473-002, 004. was elevated on both columns. All samples are clean.

(2) ccv prior to remaining 473 samples elevated on RTX-CLP2 column only. All results reported from RTX-35 column.

2. Known or Probable Causes(s)

(3) High Endrin recovery in BS. All samples clean of Endrin.

3. Discussion and Proposed Action Other Description: None

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

4. Project Manager Instructions...signature/date: [signature] 5/29/03

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

5. Final Action...signature/date: [signature] Other Explanation:

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

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

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

QA-105-A-0801

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0305L472
SDG/SAF #: H2236/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-03

PCB

The set of samples consisted of four (4) soil samples collected on 05-20-03.

The samples and their associated QC samples were extracted on 05-26-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 05-29-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082.

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

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. All samples and their associated QC samples received Florisil, Sulfuric Acid, and Sulfur cleanups.

4. The method blank was below the reporting limits for all target compounds.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. Matrix spike recoveries were unobtainable due to the dilution required for analysis.

8. All samples required 10-fold instrument dilutions due to the high concentrations of target and non-target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.

9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

5/22/03
Date

pef\r:\group\data\pest\tnu hanford\05L-472.pcb

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-111	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000025

SAMPLE ANALYSIS													
Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container				aG	aG	aG	aG	aG					
No. of Container(s)				1	1	1	1	1					
Volume				60mL	250mL	125g	60mL	60mL					
				See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1					
Sample No.	Matrix *	Sample Date	Sample Time										
J00P15	SOIL	5-20-03	1230	X	X	X		X					
J00P16	SOIL	5-20-03	1200	X	X	X		X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	5-20-03/1575	RETRA 3728	5-20-03/1515
RETRA 3728	52103 1300	SJ Galen	52103 1300
SJ Galen	52103 1300	FED EX	
Fed Ex	5-22-03/0900	S Morgan	5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

Matrix *

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-114	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 96002	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped ~~To~~: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000026

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125g	60mL	60mL	125mL	125mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	Sulfides - 9030	Total Cyanide - 9010			
Sample No. / Matrix * / Sample Date / Sample Time										
J00P17 / SOIL / 5-20-03 / 1410	X	X	X		X	X	X			
J00P18 / SOIL / 5-20-03 / 1410	X	X	X		X	X	X			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	5-20-03/1515	REF 3A 3728	5-20-03/1515
REF 3A 3728	52103 1300	S SEALE	52103 1300
S SEALE	52103 1300	FED EX	
Fed Ex	5-22-03 10:00	D Smith	5-22-03 10:00

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-190			DATA PACKAGE: H2236		
VALIDATOR: TLI		LAB: LLT		DATE: 6/9/9	
CASE:			SDG: H2236		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)	8151A	
SAMPLES/MATRIX					
J00P15 J00P16 J00P17 J00P18					
					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: NO FB

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

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

Comments: PCB + Pesticides – diluted out surr – J all
PCB + Pesticides – diluted out MS/MSD – J all
Herb – all MS/MSD but dinoseb low – J all but dinoseb
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: Silver – 32% RPD – J

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 over

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: 12 June 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 600-190
Subject: Semivolatile - Data Package No. H2236-LLI (SDG No. H2236)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2236-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	Waste Site	Analysis
J00P15	5/20/03	Soil	C	600-190	See note 1
J00P16	5/20/03	Soil	C	600-190	See note 1
J00P17	5/20/03	Soil	C	600-190	See note 1
J00P18	5/20/03	Soil	C	600-190	See note 1
J00P19	5/20/03	Soil	C	600-190	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 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".

All method blank results were acceptable.

<u>Field Blanks</u>

One field blank (J00P19) was submitted for analysis. Bis(2-ethylhexyl)phthlate an di-n-butylphthalate were detected in the method blank. Under the BHI statement of work, no qualification is required.

- **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 duplicates (J00P17/J00P18) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the RDL in samples J00P15 and J00P15-DL. Eight 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. H2236-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 undetected analytes exceeded the RDL in samples J00P15 and J00P15-DL. Eight 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 Incorporated, March 2003.

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: H2236	REVIEWER: TLI	DATE: 6/12/03	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE/PAH ANALYSIS, WATER MATRIX, (UG/L) Page__1__ of__2__

Project: BECHTEL-HANFORD																			
Laboratory: LLI																			
Case:	SDG: H2236																		
Sample Number		J00P15		J00P15-DL		J00P16		J00P17		J00P18		J00P19							
Remarks										Duplicate		E. Blank							
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03							
Extraction Date		5/23/03		5/23/03		5/23/03		5/23/03		5/23/03		5/23/03							
Analysis Date		5/28/03		5/28/03		5/28/03		5/28/03		5/28/03		5/28/03							
Semivolatile (8270C)	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
bis(2-Chloroethyl)ether	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2-Chlorophenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
1,3-Dichlorobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
1,4-Dichlorobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
1,2-Dichlorobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2-Methylphenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,2'-oxybis(1-chloropropane)	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
3 and/or 4-Methylphenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
N-Nitroso-di-n-propylamine	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Hexachloroethane	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Nitrobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Isophorone	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2-Nitrophenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,4-Dimethylphenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
bis(2-Chloroethoxy)methane	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,4-Dichlorophenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
1,2,4-Trichlorobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Naphthalene	660	100		5300	U	350	U	340	U	350	U	330	U						
4-Chloroaniline	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Hexachlorobutadiene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
4-Chloro-3-methylphenol	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2-Methylnaphthalene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Hexachlorocyclopentadiene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,4,6-Trichlorophenol	660	1100	U	5300	U	350	U	330	U	350	U	330	U						
2,4,5-Trichlorophenol	660	2600	U	13000	U	860	U	840	U	860	U	840	U						
2-Chloronaphthalene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2-Nitroaniline	660	2600	U	13000	U	860	U	840	U	860	U	840	U						
Dimethylphthalate	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Acenaphthylene	660	1100	U	5300	U	350	U	38		26		330	U						
2,6-Dinitrotoluene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Project: BECHTEL-HANFORD																			

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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.

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

Laboratory: LLI																			
Case:	SDG: H2236																		
Sample Number		J00P15		J00P15-DL		J00P16		J00P17		J00P18		J00P19							
Remarks										Duplicate		E. Blank							
Sample Date		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03		5/20/03							
Extraction Date		5/23/03		5/23/03		5/23/03		5/23/03		5/23/03		5/23/03							
Analysis Date		5/28/03		5/28/03		5/28/03		5/28/03		5/28/03		5/28/03							
Semivolatile (8270C)	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	2600	U	13000	U	860	U	860	U	860	U	840	U						
Acenaphthene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,4-Dinitrophenol	660	2600	U	13000	U	860	U	860	U	860	U	840	U						
4-Nitrophenol	660	1100	U	13000	U	860	U	860	U	860	U	840	U						
Dibenzofuran	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
2,4-Dinitrotoluene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Diethylphthalate	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
4-Chlorophenyl-phenyl ether	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Fluorene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
4-Nitroaniline	660	2600	U	13000	U	860	U	860	U	860	U	840	U						
4,6-Dinitro-2-methylphenol	660	2600	U	13000	U	860	U	860	U	860	U	840	U						
N-Nitrosodiphenylamine	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
4-Bromophenyl-phenyl ether	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Hexachlorobenzene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Pentachlorophenol	660	2600	U	13000	U	860	U	860	U	860	U	840	U						
Phenanthrene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Anthracene	660	1100	U	5300	U	350	U	47		36		330	U						
Carbazole	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Di-n-butylphthalate	660	12000		16000		350	U	340	U	350	U	78							
Fluoranthene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Pyrene	660	1100	U	5300	U	350	U	47		27		330	U						
Butylbenzylphthalate	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
3,3'-Dichlorobenzidine	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Benzo(a)anthracene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Chrysene	660	1100	U	5300	U	350	U	53		39		330	U						
bis(2-Ethylhexyl)phthalate	660	2400		2000		43		45		35		38							
Di-n-octylphthalate	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Benzo(b)fluoranthene	660	1100	U	5300	U	350	U	52		37		330	U						
Benzo(k)fluoranthene	660	1100	U	5300	U	350	U	44		35		330	U						
Benzo(a)pyrene	660	1100	U	5300	U	350	U	62		38		330	U						
Indeno(1,2,3-cd)pyrene	660	1100	U	5300	U	350	U	57		41		330	U						
Dibenz(a,h)anthracene	660	1100	U	5300	U	350	U	340	U	350	U	330	U						
Benzo(g,h,i)perylene	660	1100	U	5300	U	350	U	130		85		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.

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

Report Date: 06/03/03 15:55

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 1a

	Cust ID:	J00P15		J00P15		J00P15		J00P15		J00P16		J00P17	
Sample Information	RFW#:	001		001 DL		001 MS		001 MSD		002		003	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		5.00		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	60	%	56	%	76	%	76	%	73	%	78	%
	2-Fluorobiphenyl	62	%	65	%	75	%	73	%	76	%	76	%
	Terphenyl-d14	88	%	77	%	107	%	96	%	110	%	114	%
	Phenol-d5	56	%	59	%	66	%	64	%	68	%	72	%
	2-Fluorophenol	57	%	59	%	72	%	71	%	69	%	71	%
	2,4,6-Tribromophenol	66	%	61	%	90	%	85	%	88	%	85	%
			fl		fl		fl		fl		fl		fl
Phenol		1100	U	5300	U	66	%	63	%	350	U	340	U
bis(2-Chloroethyl)ether		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2-Chlorophenol		1100	U	5300	U	64	%	63	%	350	U	340	U
1,3-Dichlorobenzene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
1,4-Dichlorobenzene		1100	U	5300	U	66	%	70	%	350	U	340	U
1,2-Dichlorobenzene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2-Methylphenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,2'-oxybis(1-Chloropropane)		1100	U	5300	U	1100	U	1100	U	350	U	340	U
3- and/or 4-Methylphenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
N-Nitroso-di-n-propylamine		1100	U	5300	U	75	%	67	%	350	U	340	U
Hexachloroethane		1100	U	5300	U	1100	U	1100	U	350	U	340	U
Nitrobenzene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
Isophorone		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2-Nitrophenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,4-Dimethylphenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
bis(2-Chloroethoxy)methane		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,4-Dichlorophenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
1,2,4-Trichlorobenzene		1100	U	5300	U	75	%	75	%	350	U	340	U
Naphthalene		100	J	5300	U	96	J	220	J	350	U	340	U
4-Chloroaniline		1100	U	5300	U	1100	U	1100	U	350	U	340	U
Hexachlorobutadiene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
4-Chloro-3-methylphenol		1100	U	5300	U	77	%	71	%	350	U	340	U
2-Methylnaphthalene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
Hexachlorocyclopentadiene		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,4,6-Trichlorophenol		1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,4,5-Trichlorophenol		2600	U	13000	U	2600	U	2600	U	860	U	860	U

*= Outside of EPA CLP QC limits.

000013

6/10/03

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 1b

Cust ID:	J00P15		J00P15		J00P15		J00P15		J00P16		J00P17	
RFW#:	001		001 DL		001 MS		001 MSD		002		003	
2-Chloronaphthalene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
2-Nitroaniline	2600	U	13000	U	2600	U	2600	U	860	U	860	U
Dimethylphthalate	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Acenaphthylene	1100	U	5300	U	1100	U	1100	U	350	U	38	J
2,6-Dinitrotoluene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
3-Nitroaniline	2600	U	13000	U	2600	U	2600	U	860	U	860	U
Acenaphthene	1100	U	5300	U	77	%	73	%	350	U	340	U
2,4-Dinitrophenol	2600	U	13000	U	2600	U	2600	U	860	U	860	U
4-Nitrophenol	2600	U	13000	U	67	%	57	%	860	U	860	U
Dibenzofuran	1100	U	5300	U	1100	U	1100	U	350	U	340	U
2,4-Dinitrotoluene	1100	U	5300	U	78	%	64	%	350	U	340	U
Diethylphthalate	1100	U	5300	U	1100	U	1100	U	350	U	340	U
4-Chlorophenyl-phenylether	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Fluorene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
4-Nitroaniline	2600	U	13000	U	2600	U	2600	U	860	U	860	U
4,6-Dinitro-2-methylphenol	2600	U	13000	U	2600	U	2600	U	860	U	860	U
N-Nitrosodiphenylamine (1)	1100	U	5300	U	1100	U	1100	U	350	U	340	U
4-Bromophenyl-phenylether	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Hexachlorobenzene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Pentachlorophenol	2600	U	13000	U	71	%	69	%	860	U	860	U
Phenanthrene	1100	U	5300	U	1100	U	61	J	350	U	340	U
Anthracene	1100	U	5300	U	1100	U	1100	U	350	U	47	J
Carbazole	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Di-n-butylphthalate	12000	E	16000	D	13000	E	22000	E	350	U	340	U
Fluoranthene	1100	U	5300	U	1100	U	68	J	350	U	340	U
Pyrene	1100	U	5300	U	105	%	98	%	350	U	47	J
Butylbenzylphthalate	1100	U	5300	U	1100	U	1100	U	350	U	340	U
3,3'-Dichlorobenzidine	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Benzo(a)anthracene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Chrysene	1100	U	5300	U	1100	U	1100	U	350	U	53	J
bis(2-Ethylhexyl)phthalate	2400		2000	JD	2900		5900		43	J	45	J
Di-n-octyl phthalate	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Benzo(b)fluoranthene	1100	U	5300	U	1100	U	1100	U	350	U	52	J
Benzo(k)fluoranthene	1100	U	5300	U	1100	U	1100	U	350	U	44	J
Benzo(a)pyrene	1100	U	5300	U	1100	U	1100	U	350	U	62	J
Indeno(1,2,3-cd)pyrene	1100	U	5300	U	1100	U	1100	U	350	U	57	J
Dibenz(a,h)anthracene	1100	U	5300	U	1100	U	1100	U	350	U	340	U
Benzo(g,h,i)perylene	1100	U	5300	U	1100	U	1100	U	350	U	130	J

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

000014

Per Cellular

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 06/03/03 15:56

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 2a

	Cust ID:	J00P18		J00P19		SBLKUA		SBLKUA BS	
Sample Information	RFW#:	004		005		03LE0623-MB1		03LE0623-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	73	%	85	%	65	%	75	%
	2-Fluorobiphenyl	69	%	79	%	60	%	69	%
	Terphenyl-d14	111	%	138 *	%	80	%	88	%
	Phenol-d5	66	%	74	%	59	%	66	%
	2-Fluorophenol	66	%	74	%	59	%	67	%
	2,4,6-Tribromophenol	78	%	82	%	66	%	76	%
	Phenol	350	U	330	U	330	U	61	%
	bis(2-Chloroethyl)ether	350	U	330	U	330	U	330	U
	2-Chlorophenol	350	U	330	U	330	U	62	%
	1,3-Dichlorobenzene	350	U	330	U	330	U	330	U
	1,4-Dichlorobenzene	350	U	330	U	330	U	67	%
	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	70	%
	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	68	%
	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	70	%
	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	860	U	840	U	840	U	840	U

*= Outside of EPA CLP QC limits.

000015

6/10/03

RFW Batch Number: 0305L472 Client: TNUHANFORD B03-015 H2236 Work Order: 11343606001 Page: 2b

Cust ID:	J00P18		J00P19		SBLKUA		SBLKUA BS	
RFW#:	004		005		03LE0623-MB1		03LE0623-MB1	
2-Chloronaphthalene	350	U	330	U	330	U	330	U
2-Nitroaniline	860	U	840	U	840	U	840	U
Dimethylphthalate	350	U	330	U	330	U	330	U
Acenaphthylene	26	J	330	U	330	U	330	U
2,6-Dinitrotoluene	350	U	330	U	330	U	330	U
3-Nitroaniline	860	U	840	U	840	U	840	U
Acenaphthene	350	U	330	U	330	U	69	%
2,4-Dinitrophenol	860	U	840	U	840	U	840	U
4-Nitrophenol	860	U	840	U	840	U	75	%
Dibenzofuran	350	U	330	U	330	U	330	U
2,4-Dinitrotoluene	350	U	330	U	330	U	79	%
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	860	U	840	U	840	U	840	U
4,6-Dinitro-2-methylphenol	860	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	860	U	840	U	840	U	65	%
Phenanthrene	350	U	330	U	330	U	330	U
Anthracene	36	J	330	U	330	U	330	U
Carbazole	350	U	330	U	330	U	330	U
Di-n-butylphthalate	350	U	78	J	330	U	18	J
Fluoranthene	350	U	330	U	330	U	330	U
Pyrene	27	J	330	U	330	U	78	%
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	39	J	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	35	J	38	J	330	U	330	U
Di-n-octyl phthalate	350	U	330	U	330	U	330	U
Benzo(b)fluoranthene	37	J	330	U	330	U	330	U
Benzo(k)fluoranthene	35	J	330	U	330	U	330	U
Benzo(a)pyrene	38	J	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	41	J	330	U	330	U	330	U
Dibenz(a,h)anthracene	350	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	85	J	330	U	330	U	330	U

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

000016

9

2/10/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B03-015
LVL #: 0305L472
SDG/SAF # H2236/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 05-22-2003

SEMIVOLATILE

Five (5) soil samples were collected on 05-20-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on SW 846 method 3550 on 05-23-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-27,28,30-2003.

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. Sample J00P15 required a 5-fold dilution due to the high levels of target compounds.

5. One (1) of sixty (60) surrogate recoveries was outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).

6. All matrix spike recoveries were within EPA QC limits.

7. All blank spike recoveries were within EPA QC limits.

8. Internal standard area criteria were not met for samples J00P19 and M00P15 MSD. However, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, the samples were not reanalyzed.

9. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

for J. Michael Taylor
President
Lionville Laboratory Incorporated

06-04-03
Date

som\gorup\data\bna\tnu-hanford-0305-472.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 2 0 pages.

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-111	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: FRC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: AC30236		Bill of Lading/Air Bill No.: 3GE 05PC

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area. No Activity Report Required

Special Handling and/or Storage

Cool 4 c

000019

SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1
Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1
Volume	60mL	250mL	125g	60mL	60mL

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1
J00P15	SOIL	5-20-03	1230	X	X	X		X
J00P16	SOIL	5-20-03	1200	X	X	X		X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	5-20-03/1515	RET 3A 3728	5-20-03/1515
RET 3A 3728	52103 1300	SJ Galle	52103 1300
SJ Galle	52103 1300	FED EX	
Fed Ex	5-22-03/0900	D Smith	5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

Matrix *

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-114	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 96002	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: SEE 03PC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

020000

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	250mL	125g	60mL	60mL	125mL	125mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1	Sulfides - 9030	Total Cyanide - 9010				
Sample No.	Matrix *	Sample Date	Sample Time								
J00P17	SOIL	5-20-03	1410	X	X	X		X	X	X	
J00P18	SOIL	5-20-03	1410	X	X	X		X	X	X	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	D049 Bowers	5-20-03/1515	Ref 3A 3728	5-20-03/1515
Relinquished By/Removed From	REF 3A 3728	52103 1300	S GALE	52103 1300
Relinquished By/Removed From	S GALE	52103 1300	FED EX	
Relinquished By/Removed From	Fed Ex	5-22-03 10900	D Smith	5-22-03 0900
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, Chromium, Lead, Selenium, Silver]; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-112	Page 1 of 1

Collector: R Fahlberg / DL Bowers	Company Contact: M Stankovich	Telephone No.: 531-7620	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality: —	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 600-190	SAF No.: B03-015	
Ice Chest No.: ERC 99 042	Field Logbook No.: EL 1577	COA: C17HXU671C	Method of Shipment: Fed Ex
Shipped To: TMA/RECRA	Offsite Property No.: A030236	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Sample Originated From Non-Rad Area, No Activity Report Required

Special Handling and/or Storage

Cool 4 c

Preservation	None	Cool 4C	Cool 4C								
Type of Container	aG	aG	aG								
No. of Container(s)	1	1	1								
Volume	60mL	125g	60mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)								

000021

Sample No.	Matrix *	Sample Date	Sample Time										
J00P19	SOIL	5-20-03	1750	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	5-20-03/1515	REF 3A 3728	5-20-03/1515
REF 3A 3728	52103 1300	SJGALE	52103 1300
SJGALE	52103 1300	FEDEX	
Fed Ex	5-22-03/0900	[illegible]	5-22-03/0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use for QA/QC

Personnel not available to relinquish samples from the 3728 Ref # 3A on 5/21/03

Matrix *

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

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-190			DATA PACKAGE: H2236		
VALIDATOR: TLJ		LAB: LLI		DATE: 6/9/02	
CASE:			SDG: H2236		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00P15 J00P16 J00P17 J00P18 J00P19					
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: di-n-butylphthalate + bis(2-ethylhexyl)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 PA

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

Comments: _____

7. HOLDING TIMES (all levels)

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments: all over in PIS – 8 over in all other

9. SAMPLE CLEANUP (Levels D and E)

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

Comments:

LIONVILLE LABORATORY INC.

4 June 2003

Joan Kessner
Bechtel-Hanford, Inc.
3190 Washington Way
MSIN H9-03
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0305L472
SDG #	H2236
SAF #	B03-015
Date Received	5-22-03
# Samples	5
Matrix	Soil
Volatiles	
Semivolatiles	X
Pest/PCB	X
DRO/KRO/GRO	
GC Alcohols	
Herbicides	X
Metals	X
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

RECEIVED
JUN 2003

r:\group\pm\orlette\tnu-hanford\data\b_ltrs.doc

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