0071163

SAF-RC-020
100-BC Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02 _____ INITIAL/DATE

Administrative Record _____ INITIAL/DATE

COMMENTS:

SDG K0465 SAF-RC-020

Waste Site: 128-B-3

RECEIVED
OCT 05 2006
EDMC

Date: 15 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 128-B-3
Subject: Wet Chemistry - Data Package No. K0465-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0465 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J12P53	6/29/06	Soil	C	See note 1
J12P54	6/29/06	Soil	C	See note 1
J12P55	6/29/06	Soil	C	See note 1
J12PY9	6/29/06	Soil	C	See note 1
J12PW9	6/29/06	Soil	C	See note 1
J12PX0	6/29/06	Soil	C	See note 1
J12PX1	6/29/06	Soil	C	See note 1
J12PX2	6/29/06	Soil	C	See note 1
J12PX3	6/29/06	Soil	C	See note 1

1 – Chromium VI by 7196A & petroleum hydrocarbons by 9071/418.1.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI and 28 days for petroleum hydrocarbons

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

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All TPH results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package K0465 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 TPH results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH 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

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0465	REVIEWER: TLI	Project: 128-B-3	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0465																		
Sample Number		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.25		0.32		0.20	U	0.22		0.20	U	0.20	U	0.25		0.20	U	0.31	
Petroleum Hydrocarbons	5	133	U	133	U	134	U	133	U	258		134	U	132	U	133	U	133	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 07/26/06

IENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426
RK ORDER: 11343-606-001-9999-00

MPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
01	J12PS3	% Solids	99.5		%	0.01	1.0
		Chromium VI	0.25		MG/KG	0.20	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
02	J12PS4	% Solids	99.8		%	0.01	1.0
		Chromium VI	0.32		MG/KG	0.20	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
03	J12PS5	% Solids	99.3		%	0.01	1.0
		Chromium VI	0.20	u	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	134	u	MG/KG	134	1.0
04	J12PY9	% Solids	99.6		%	0.01	1.0
		Chromium VI	0.22		MG/KG	0.20	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
05	J12PW9	% Solids	100		%	0.01	1.0
		Chromium VI	0.20	u	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	258		MG/KG	133	1.0
06	J12PX0	% Solids	99.6		%	0.01	1.0
		Chromium VI	0.20	u	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	134	u	MG/KG	134	1.0
07	J12PX1	% Solids	99.8		%	0.01	1.0
		Chromium VI	0.25		MG/KG	0.20	1.0
		Petroleum Hydrocarbons	132	u	MG/KG	132	1.0
08	J12PX2	% Solids	100		%	0.01	1.0
		Chromium VI	0.20	u	MG/KG	0.20	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
09	J12PX3	% Solids	99.9		%	0.01	1.0
		Chromium VI	0.31		MG/KG	0.20	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

9/14/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020 K0465
LVL#: 0607L426

W.O.#: 11343-606-001-9999-00
Date Received: 07-06-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 9 soil samples.

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

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvLI certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

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

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

5. The method blanks were within the method criteria.

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

7. The matrix spike recoveries for Petroleum Hydrocarbons (PHC) and Chromium VI were within the 75-125% control limits.

8. The replicate analyses for PHC and Percent Solids were within the 20% Relative Percent Difference (RPD) control limit however replicate analysis for Chromium VI was outside the control limit that may be attributed to sample inhomogeneity.

9. Results for solid samples are reported on a dry weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/27/06
Date

njp\07-426

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 14 pages.

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

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	DL	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
FRC-03-103	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	G/P	aG	aG	G	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				

000014

Sample No.	Matrix *	Sample Date	Sample Time										
J12P53	SOIL	06/29/06	0925	✓	✓	✓	✓	✓	✓				C-12
J12P54	SOIL		0928	✓	✓	✓	✓	✓	✓				C-11
J12P55	SOIL	06/29/06	0935	✓	✓	✓	✓	✓	✓				C-17
~~J12P56~~	~~SOIL~~	06/29/06											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time 1720	Received By/Stored In	Date/Time 1720
C Martinez C Martinez	06/29/06	3728 3B	06/29/06
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728/3B 7/5/06	1000	M Stankovich 7/5/06	1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Stankovich 7/5/06	1600	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX 7-6-06	0930	7-6-06	0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref 3B on 7/5/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

C. Martinez	C. Martinez 509-539-2816	KESSNER, JH	Price Code 813 Data Turnaround
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 128-B-3 (Upland/General/Tar)	SAF No. RC-020	Air Quality 21 days
Ice Chest No. ERC-03-~~103~~ 103 MO 7/5/06	Field Logbook No. EFL 1173-8 / COA R128B32000	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. A060518	Bill of Lading/Air Bill No. See OSPC	

000000012

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8360A (TCL)	Pesticides - 8081	TPH (Total) - 418				

000015

Sample No.	Matrix *	Sample Date	Sample Time										
J12PY9	SOIL	06/29/06	1400	✓	✓	✓	✓	✓	✓				D 2

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A	7/5/06 0930	M Stankovich	7/5/06 0930
M Stankovich	7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 3A on 7/5/06

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WT=Wipe, L=Liquid, V=Vapor/Gas, X=Other

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

BHI-EE-011 (08/29/2005)

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	80	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-006	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060517	See OSPC

000000013

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°c

000016

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				

Sample No.	Matrix *	Sample Date	Sample Time										
J12PW9	SOIL	06/29/06	0955	✓	✓	✓	✓	✓	✓				C-
J12PX0	SOIL		0958	✓	✓	✓	✓	✓	✓				2
J12PX1	SOIL		1002	✓	✓	✓	✓	✓	✓				3
J12PX2	SOIL		1005	✓	✓	✓	✓	✓	✓				6
J12PX3	SOIL	06/29/06	1012	✓	✓	✓	✓	✓	✓				5

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A	7/5/06 0900	MStankovich	7/5/06 0900
WCH MStankovich	7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728
Ref # 3A on 7/5/06

Matrix: S-Soil, SE-Sediment, SO-Solid, SI-Sludge, W-Water, O-Oil, A-Air, OS-Drum S, OL-Drum L, 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 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128-B-3			DATA PACKAGE: K0465		
VALIDATOR: TLI		LAB: LCI		DATE: 9/10/06	
			SDG: K0465		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J12PS3 J12PS4 J12PS5 J12PY9 J12PW9					
J12PX0 J12PX1 J12PX2 J12PX3					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

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

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

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

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

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

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: no FB

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

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

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

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 ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: all TPH over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/26/06

JENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426
RK ORDER: 11343-606-001-9999-00

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
ANK10	06LVI072-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0
ANK10	06LHC037-MB1	Petroleum Hydrocarbons	133 u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/26/06

.IENT: TNUHANFORD RC-020 X0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
01	J12P53	Soluble Chromium VI	4.1	0.25	4.0	95.7	1.0
		Insoluble Chromium VI	1270	0.25	1380	92.4	100
02	J12P54	Petroleum Hydrocarbons	579	56.3	558	93.8	1.0
ANK10	06LVI072-MB1	Soluble Chromium VI	4.0	0.20u	4.0	99.2	1.0
		Insoluble Chromium VI	1160	0.20u	1170	99.0	100
ANK10	06LHC037-MB1	Petroleum Hydrocarbons	582	133 u	560	103.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/26/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
01REP	J12P53	Chromium VI	0.25	0.20u	~~NC~~ 66.2	1.0
02REP	J12P54	Petroleum Hydrocarbons	133 u	133 u	NC	1.0
09REP	J12PX3	% Solids	99.9	99.9	0.00	1.0

Date: 15 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 128-B-3
Subject: Volatile Organics - Data Package No. K0465-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0465 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J12P53	6/29/06	Soil	C	VOAs by 8260B
J12P54	6/29/06	Soil	C	VOAs by 8260B
J12P55	6/29/06	Soil	C	VOAs by 8260B
J12PY9	6/29/06	Soil	C	VOAs by 8260B
J12PW9	6/29/06	Soil	C	VOAs by 8260B
J12PX0	6/29/06	Soil	C	VOAs by 8260B
J12PX1	6/29/06	Soil	C	VOAs by 8260B
J12PX2	6/29/06	Soil	C	VOAs by 8260B
J12PX3	6/29/06	Soil	C	VOAs by 8260B

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within 14 days of the date of sample collection. If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, the methylene chloride results in all samples (except J12P53 & J12PY9) were qualified as undetected and flagged "U".

Due to method blank contamination, the methylene chloride result in sample J12P53 was raised to the RQL, flagged as undetected and flagged "U".

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified

as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

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.

Due to RPDs outside QC limits, all acetone (56%), 2-butanone (46%) and 2-hexanone (34%) results were qualified as an estimate and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **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 analytes met the RQL.

- **Completeness**

Data package No. K0465 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the methylene chloride results in all samples (except J12P53 & J12PY9) were qualified as undetected and flagged "U".
- Due to method blank contamination, the methylene chloride result in sample J12P53 was raised to the RQL, flagged as undetected and flagged "U".
- Due to RPDs outside QC limits, all acetone (56%), 2-butanone (4%) and 2-hexanone (34%) results were qualified as an estimate and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH 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

VOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K0465	REVIEWER: TCL	Project: 128-B-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All (except J12P53 & J12PY9)	Method blank contamination
Methylene chloride	U at RQL	J12P53	Method blank contamination
Acetone 2-Butanone 2-Hexanone	J	All	RPD

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI																			
Case:	SDG: K0465																		
Sample Number		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Analysis Date		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06		7/13/06	
VOA	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	9	U	10	U	9	U	10	U	9	U
Bromomethane	10	10	U	10	U	10	U	10	U	9	U	10	U	9	U	10	U	9	U
Vinyl Chloride	10	10	U	10	U	10	U	10	U	9	U	10	U	9	U	10	U	9	U
Chloroethane	10	10	U	10	U	10	U	10	U	9	U	10	U	9	U	10	U	9	U
Methylene Chloride	10	10	U	15	U	18	U	22		16	U	12	U	16	U	16	U	13	U
Acetone	10	10	UJ	10	J	10	UJ	13	J	9	UJ	10	UJ	9	UJ	10	UJ	9	UJ
Carbon Disulfide	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Chloroform	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
2-Butanone	10	10	UJ	10	UJ	10	UJ	10	UJ	9	UJ	10	UJ	9	UJ	10	UJ	9	UJ
1,1,1-Trichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Bromodichloromethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Trichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Dibromochloromethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Benzene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
trans-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Bromoform	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U	9	U	10	U	9	U	10	U	9	U
2-Hexanone	10	10	UJ	10	UJ	10	UJ	10	UJ	9	UJ	10	UJ	9	UJ	10	UJ	9	UJ
Tetrachloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Toluene	10	5	U	5	U	1		1		5	U	1		2		2		5	U
Chlorobenzene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Ethylbenzene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Styrene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Xylene	10	5	U	5	U	5	U	5	U	5	U	2		3		3		5	U
cis-1,2-Dichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U

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

000011

Volatiles by GC/MS, HSL List

Report Date: 08/01/06 14:47

RFW Batch Number: 0607L426 Client: TNUHANFORD RC-020 K0465 Work Order: 11343606001 Page: 1a

	Cust ID:	J12P53	J12P54	J12P55	J12PY9	J12PW9	J12PX0
Sample Information	RFW#:	001	002	003	004	005	006
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.980	0.962	0.943	0.943	0.943	0.980
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Toluene-d8	92 %	94 %	94 %	98 %	94 %	96 %
	Bromofluorobenzene	95 %	96 %	93 %	91 %	95 %	100 %
	1,2-Dichloroethane-d4	99 %	101 %	99 %	98 %	103 %	110 %
		fl	fl	fl	fl	fl	fl
Chloromethane		10 U	10 U	10 U	10 U	9 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	9 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	9 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	9 U	10 U
Methylene Chloride		10 ~~8~~ B U	15 ~~B~~ U	18 ~~B~~ U	22 ~~B~~	16 ~~B~~ U	12 ~~B~~ U
Acetone		10 U J	10 J	10 U J	13 J	9 U J	10 U J
Carbon Disulfide		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	5 U	5 U	5 U	5 U	5 U
Chloroform		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone		10 U J	10 U J	10 U J	10 U J	9 U J	10 U J
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene		5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Benzene		5 U	5 U	5 U	5 U	5 U	5 U
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	9 U	10 U
2-Hexanone		10 U J	10 U J	10 U J	10 U J	9 U J	10 U J
Tetrachloroethene		5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U	5 U	5 U
Toluene		5 U	5 U	1 J	1 J	5 U	1 J

*= Outside of EPA CLP QC limits.

R 9/14/06

0000012

Cust ID:	J12P53	J12P54	J12P55	J12PY9	J12PW9	J12PX0
RFW#:	001	002	003	004	005	006
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5
Styrene	5 U	5 U	5 U	5 U	5 U	5
Xylene (total)	5 U	5 U	5 U	5 U	5 U	2 J
cis-1,2-dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

000013

9/14/00

Volatiles by GC/MS, HSL List

Report Date: 08/01/06 14:47

RFW Batch Number: 0607L426 Client: TNUHANFORD RC-020 K0465 Work Order: 11343606001 Page: 2a

	Cust ID:	J12PX1		J12PX2		J12PX3		J12PX3		J12PX3		VBLKIB	
Sample Information	RFW#:	007		008		009		009 MS		009 MSD		06LVX170-MB	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	0.943		0.962		0.943		0.943		0.943		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	95	%	93	%	96	%	95	%	98	%	98	%
	Bromofluorobenzene	94	%	95	%	104	%	100	%	100	%	111	%
	1,2-Dichloroethane-d4	101	%	98	%	111	%	113	%	113	%	113	%
			fl		fl		fl		fl		fl		fl
Chloromethane		9	U	10	U	9	U	58	%	62	%	10	U
Bromomethane		9	U	10	U	9	U	73	%	71	%	10	U
Vinyl Chloride		9	U	10	U	9	U	59	%	62	%	10	U
Chloroethane		9	U	10	U	9	U	70	%	68	%	10	U
Methylene Chloride		16	~~B~~ U	16	~~B~~ U	13	~~B~~	64	%	73	%	2	J
Acetone		9	UJ	10	UJ	9	UJ	184	%	103	%	10	U
Carbon Disulfide		5	U	5	U	5	U	90	%	102	%	5	U
1,1-Dichloroethene		5	U	5	U	5	U	77	%	80	%	5	U
1,1-Dichloroethane		5	U	5	U	5	U	83	%	89	%	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	80	%	84	%	5	U
Chloroform		5	U	5	U	5	U	89	%	96	%	5	U
1,2-Dichloroethane		5	U	5	U	5	U	111	%	110	%	5	U
2-Butanone		9	UJ	10	UJ	9	UJ	122	%	76	%	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	94	%	101	%	5	U
Carbon Tetrachloride		5	U	5	U	5	U	90	%	99	%	5	U
Bromodichloromethane		5	U	5	U	5	U	99	%	102	%	5	U
1,2-Dichloropropane		5	U	5	U	5	U	85	%	95	%	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	73	%	75	%	5	U
Trichloroethene		5	U	5	U	5	U	106	%	116	%	5	U
Dibromochloromethane		5	U	5	U	5	U	105	%	105	%	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	98	%	99	%	5	U
Benzene		5	U	5	U	5	U	84	%	90	%	5	U
Trans-1,3-Dichloropropene		5	U	5	U	5	U	73	%	75	%	5	U
Bromoform		5	U	5	U	5	U	127	%	114	%	5	U
4-Methyl-2-pentanone		9	U	10	U	9	U	114	%	87	%	10	U
2-Hexanone		9	UJ	10	UJ	9	UJ	116	%	82	%	10	U
Tetrachloroethene		5	U	5	U	5	U	97	%	108	%	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	97	%	74	%	5	U
Toluene		2	J	2	J	5	U	86	%	93	%	5	U

*= Outside of EPA CLP QC limits.

9/14/06

000014

Cust ID:	J12PX1	J12PX2	J12PX3	J12PX3	J12PX3	VBLKIB
RFW#:	007	008	009	009 MS	009 MSD	06LVX170-MB1
Chlorobenzene	5 U	5 U	5 U	94 %	100 %	5 U
Ethylbenzene	5 U	5 U	5 U	87 %	90 %	5 U
Styrene	5 U	5 U	5 U	85 %	86 %	5 U
Xylene (total)	3 J	3 J	5 U	91 %	97 %	5 U
cis-1,2-dichloroethene	5 U	5 U	5 U	72 %	77 %	5 U
trans-1,2-dichloroethene	5 U	5 U	5 U	88 %	90 %	5 U

*= Outside of EPA CLP QC limits.

000015

9/24/06

Cust ID: VBLKIB BS

Sample Information
RFW#: 06LVX170-MB1
Matrix: SOIL
D.F.: 1.00
Units: ug/Kg

Surrogate Recovery	Toluene-d8	93	%
	Bromofluorobenzene	94	%
	1,2-Dichloroethane-d4	109	%

Chloromethane	59	%
Bromomethane	67	%
Vinyl Chloride	60	%
Chloroethane	70	%
Methylene Chloride	69	%
Acetone	79	%
Carbon Disulfide	99	%
1,1-Dichloroethene	83	%
1,1-Dichloroethane	81	%
1,2-Dichloroethene (total)	78	%
Chloroform	87	%
1,2-Dichloroethane	108	%
2-Butanone	74	%
1,1,1-Trichloroethane	92	%
Carbon Tetrachloride	89	%
Bromodichloromethane	96	%
1,2-Dichloropropane	85	%
cis-1,3-Dichloropropene	77	%
Trichloroethene	102	%
Dibromochloromethane	101	%
1,1,2-Trichloroethane	90	%
Benzene	86	%
Trans-1,3-Dichloropropene	77	%
Bromoform	107	%
4-Methyl-2-pentanone	83	%
2-Hexanone	75	%
Tetrachloroethene	92	%
1,1,2,2-Tetrachloroethane	72	%
Toluene	84	%

*= Outside of EPA CLP QC limits.

9/14/06

000016

Cust ID: VBLKIB BS

RFW#: 06LVX170-MB1

Chlorobenzene	90	%
Ethylbenzene	82	%
Styrene	83	%
Xylene (total)	88	%
cis-1,2-dichloroethene	75	%
trans-1,2-dichloroethene	81	%

*= Outside of EPA CLP QC limits.

000017

9/14/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L426
SDG/SAF # K0465/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

GC/MS VOLATILE

Nine (9) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL volatile target compounds on 07-13-2006.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were analyzed within required holding time.
2. The soil sample results were reported on a dry-weight basis.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. The matrix spike samples were inadvertently analyzed out of tune time. All spike and surrogate recoveries were within acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 2 8 pages.

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

11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

for

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/14/02
Date

som\group\data\voa\tmu-hanford\0607-426.doc

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: [illegible]

Initiator: [illegible] Batch: [illegible] Parameter: [illegible]
Date: [illegible] Samples: [illegible] Matrix: Soil
Client: [illegible] Method: SW846/MCAWW/CLP/ Prep Batch: —

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)

MS/MSD ran out of time-time.

2. Known or Probable Causes(s)

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)

No impact. Samples now out of hold.
Report & Narrate.

4. Project Manager Instructions...signature/date: [illegible] 7/14/06

✓ 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: [illegible] 8/1/06 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X 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
2	X Initiator NS	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: Stone/Johnson	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-In: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Collector C. Martinez	Company Contact C. Martinez	Telephone No. 509-539-2816	Project Coordinator KESSNER, JH
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 128-B-3 (Upland/General/Tar)		SAF No. RC-020
Ice Chest No. ERC-03-103	Field Logbook No. EFL 1173-8	COA R128B32000	Method of Shipment FED EX
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060518		Bill of Lading/Air Bill No. See OSPC

Price Code 8D Data Turnaround Air Quality 21 days

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool 4°C

000022

SAMPLE ANALYSIS

			Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
			Type of Container	G/P	aG	aG	G	aG	aG				
			No. of Container(s)	1	1	1	1	1	1				
			Volume	254g	120mL	250mL	120mL	250mL	250mL				
				See Item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				
Sample No.	Matrix *	Sample Date	Sample Time										
J12P53	SOIL	06/29/06	0925	✓	✓	✓	✓	✓	✓				C-12
J12P54	SOIL		0928	✓	✓	✓	✓	✓	✓				C-11
J12P55	SOIL	06/29/06	0935	✓	✓	✓	✓	✓	✓				C-17
~~J12P56~~	~~SOIL~~	06/29/06											

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez C. Martinez	06/29/06 1720	3728 3B	06/29/06 1720
3728/3B	7/5/06 1000	M Stankovich	7/5/06 1000
M Stankovich	7/5/06 1600	FED EX	
FED EX	7-6-06 0930		7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]: Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #3B on 7/5/06

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

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

BHI-EE-011 (08/29/2005)

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8D	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
~~EKC-03-103~~ 103 no 7/5/06	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES/LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	120mL	250mL	120mL	250mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1					

000023

Sample No.	Matrix *	Sample Date	Sample Time										
J12PY9	SOIL	06/29/06	1400	✓	✓	✓	✓	✓	✓				D 2

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez	06/29/06 1720	3728 3A	06/29/06 1720
3728/3A	7/5/06 0930	M Stankovich	7/5/06 0930
M Stankovich	7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728
Ref # 3A on 7/5/06

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 (08/29/2005)

Collector C. Martinez	Company Contact C. Martinez Telephone No. 509-539-2816	Project Coordinator KESSNER, JH	Price Code 8D Data Turnaround
Project Designation 100-BC Burial Grounds - Soil Full Protocol	Sampling Location 128-B-3 (Upland/General/Tar)	SAF No. RC-020	Air Quality 21 days
Ice Chest No. ERC-02-006	Field Logbook No. EFL 1173-8 COA R128B32000	Method of Shipment FED EX	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A060517	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°c

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See Item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418 1				

000024

Sample No.	Matrix *	Sample Date	Sample Time										
J12PW9	SOIL	06/29/06	0955	✓	✓	✓	✓	✓	✓				C-1
J12PX0	SOIL		0958	✓	✓	✓	✓	✓	✓				2
J12PX1	SOIL		1002	✓	✓	✓	✓	✓	✓				3
J12PX2	SOIL		1005	✓	✓	✓	✓	✓	✓				6
J12PX3	SOIL	06/29/06	1012	✓	✓	✓	✓	✓	✓				5

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Martinez / C. Martinez	Date/Time: 1720 06/29/06	Received By/Stored In: 3728 3A	Date/Time: 1720 06/29/06
Relinquished By/Removed From: 3728/3A	Date/Time: 7/5/06 0900	Received By/Stored In: MStankovich	Date/Time: 7/5/06 0900
Relinquished By/Removed From: WCH MStankovich	Date/Time: 7/5/06 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 7-6-06 0930	Received By/Stored In: [signature]	Date/Time: 7-6-06 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728

Ref # 3A on 7/5/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128-B-3			DATA PACKAGE: K0465		
VALIDATOR: TLI		LAB: LCF		DATE: 9/10/06	
			SDG: K0465		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J12P53	J12P54	J12P55	J12P49	J12PW9	
J12PX0	J12PX1	J12PX2	J12PX3		
					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: Methylene Chloride - U at RQL - 53
U at level - S4, S5, W9, X0, X1, X2, X3

no FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

MS/MSD RPD values acceptable? ..... Yes No N/A

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

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

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

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

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

Comments: acetone (56%) 2-butanone (46%) 2-hexanone (34%) = J all

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A

Iinternal standard areas acceptable? ..... Yes No N/A

Internal standard retention times acceptable? ..... Yes No N/A

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

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
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: _____

9. SAMPLE CLEANUP (Levels D and E)

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

Comments: _____

Date: 15 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 128-B-3
Subject: Semivolatile - Data Package No. K0465-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0465 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	Data
J12P53	6/29/06	Soil	C	SVOAs by 8270C
J12P54	6/29/06	Soil	C	SVOAs by 8270C
J12P55	6/29/06	Soil	C	SVOAs by 8270C
J12PY9	6/29/06	Soil	C	SVOAs by 8270C
J12PW9	6/29/06	Soil	C	SVOAs by 8270C
J12PX0	6/29/06	Soil	C	SVOAs by 8270C
J12PX1	6/29/06	Soil	C	SVOAs by 8270C
J12PX2	6/29/06	Soil	C	SVOAs by 8270C
J12PX3	6/29/06	Soil	C	SVOAs by 8270C

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

Due to method blank contamination, all bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J".

Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **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. Seventy-two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0465 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all bis(2-ethylhexyl)phthalate results were raised to the RQL, qualified as undetected and flagged "U".

Seventy-two analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the WCH 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

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0465 [redacted]	REVIEWER: [redacted]	Project: 128-B-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Blank contamination

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD
Laboratory: LLI SDG: K0465

Sample Number		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06	
Analysis Date		7/29/06		7/29/06		7/29/06		7/31/06		8/1/06		8/1/06		8/1/06		8/1/06		7/31/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
bis(2-Chloroethyl)ether	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2-Chlorophenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
1,3-Dichlorobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
1,4-Dichlorobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
1,2-Dichlorobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2-Methylphenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,2'-oxybis(1-chloropropane)	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
3 and/or 4-Methylphenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
N-Nitroso-di-n-propylamine	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Hexachloroethane	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Nitrobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Isophorone	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2-Nitrophenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4-Dimethylphenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4-Dichlorophenol	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Naphthalene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
4-Chloroaniline		340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Hexachlorobutadiene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2-Methylnaphthalene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Hexachlorocyclopentadiene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4,6-Trichlorophenol		340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4,5-Trichlorophenol*	660	840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
2-Chloronaphthalene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2-Nitroaniline*	660	840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
Dimethylphthalate	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Acenaphthylene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,6-Dinitrotoluene		340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000010

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD

Laboratory: LLI SDG: K0465

Sample Number		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06		7/10/06	
Analysis Date		7/29/06		7/29/06		7/29/06		7/31/06		8/1/06		8/1/06		8/1/06		8/1/06		7/31/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*		840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
Acenaphthene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4-Dinitrophenol*	660	840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
4-Nitrophenol*		840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
Dibenzofuran	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
2,4-Dinitrotoluene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Diethylphthalate	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
4-Chlorophenyl-phenyl ether	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Fluorene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
4-Nitroaniline*		840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
4,6-Dinitro-2-methylphenol*	660	840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
N-Nitrosodiphenylamine	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
4-Bromophenyl-phenyl ether	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Hexachlorobenzene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Pentachlorophenol*	660	840	U	840	U	840	U	840	U	830	U	840	U	830	U	830	U	830	U
Phenanthrene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Anthracene	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Carbazole	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Di-n-butylphthalate	660	340	U	330	U	28		330	U	330	U	21		330	U	330	U	330	U
Fluoranthene	660	340	U	330	U	62		17		17		330	U	330	U	330	U	330	U
Pyrene	660	340	U	330	U	87		21		25		330	U	330	U	330	U	330	U
Butylbenzylphthalate	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Benzo(a)anthracene	660	340	U	330	U	47		23		21		330	U	330	U	330	U	330	U
Chrysene	660	340	U	330	U	57		52		100		330	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	340	U	330	U	340	U	330	U	330	U	330	U	330	U	330	U	330	U
Benzo(b)fluoranthene	660	340	U	330	U	30		330	U	55		330	U	330	U	330	U	330	U
Benzo(k)fluoranthene	660	340	U	330	U	43		330	U	25		330	U	330	U	330	U	330	U
Benzo(a)pyrene	660	340	U	330	U	40		28		53		330	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	660	340	U	330	U	18		330	U	50		330	U	330	U	330	U	330	U
Dibenz(a,h)anthracene	660	340	U	330	U	340	U	330	U	56		330	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	660	340	U	330	U	21		41		90		330	U	330	U	330	U	330	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000011

	Cust ID:	J12P53	J12P53	J12P53	J12P54	J12P55	J12PY9
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	77 %	63 %	66 %	57 %	67 %	64 %
	2-Fluorobiphenyl	78 %	76 %	66 %	56 %	71 %	72 %
	Terphenyl-d14	91 %	87 %	80 %	71 %	94 %	56 %
	Phenol-d5	79 %	69 %	66 %	61 %	74 %	70 %
	2-Fluorophenol	78 %	57 %	70 %	61 %	72 %	67 %
	2,4,6-Tribromophenol	61 %	92 %	81 %	39 %	75 %	80 %
		fl	fl	fl	fl	fl	fl
Phenol		340 U	64 %	65 %	330 U	340 U	330 U
bis(2-Chloroethyl)ether		340 U	62 %	69 %	330 U	340 U	330 U
2-Chlorophenol		340 U	62 %	69 %	330 U	340 U	330 U
1,3-Dichlorobenzene		340 U	52 %	66 %	330 U	340 U	330 U
1,4-Dichlorobenzene		340 U	53 %	66 %	330 U	340 U	330 U
1,2-Dichlorobenzene		340 U	58 %	69 %	330 U	340 U	330 U
2-Methylphenol		340 U	67 %	64 %	330 U	340 U	330 U
2,2'-oxybis(1-Chloropropane)		340 U	61 %	65 %	330 U	340 U	330 U
4-Methylphenol		340 U	69 %	63 %	330 U	340 U	330 U
N-Nitroso-di-n-propylamine		340 U	76 %	66 %	330 U	340 U	330 U
Hexachloroethane		340 U	53 %	66 %	330 U	340 U	330 U
Nitrobenzene		340 U	64 %	70 %	330 U	340 U	330 U
Isophorone		340 U	78 %	78 %	330 U	340 U	330 U
2-Nitrophenol		340 U	69 %	69 %	330 U	340 U	330 U
2,4-Dimethylphenol		340 U	52 %	52 %	330 U	340 U	330 U
bis(2-Chloroethoxy)methane		340 U	71 %	73 %	330 U	340 U	330 U
2,4-Dichlorophenol		340 U	71 %	73 %	330 U	340 U	330 U
1,2,4-Trichlorobenzene		340 U	62 %	69 %	330 U	340 U	330 U
Naphthalene		340 U	66 %	71 %	330 U	340 U	330 U
4-Chloroaniline		340 U	80 %	82 %	330 U	340 U	330 U
Hexachlorobutadiene		340 U	65 %	78 %	330 U	340 U	330 U
4-Chloro-3-methylphenol		340 U	76 %	77 %	330 U	340 U	330 U
2-Methylnaphthalene		340 U	76 %	80 %	330 U	340 U	330 U
Hexachlorocyclopentadiene		340 U	68 %	56 %	330 U	340 U	330 U
2,4,6-Trichlorophenol		340 U	76 %	69 %	330 U	340 U	330 U
2,4,5-Trichlorophenol		840 U	81 %	73 %	840 U	840 U	840 U

*= Outside of EPA CLP QC limits.

9/14/06

000000007

000012

CLIENT ID:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
RFW#:	001	001 MS	001 MSD	002	003	004
2-Chloronaphthalene	340 U	74 %	71 %	330 U	340 U	330 U
2-Nitroaniline	840 U	86 %	83 %	840 U	840 U	840 U
Dimethylphthalate	340 U	81 %	79 %	330 U	340 U	330 U
Acenaphthylene	340 U	82 %	79 %	330 U	340 U	330 U
2,6-Dinitrotoluene	340 U	82 %	80 %	330 U	340 U	330 U
3-Nitroaniline	840 U	97 %	99 %	840 U	840 U	840 U
Acenaphthene	340 U	78 %	76 %	330 U	340 U	330 U
2,4-Dinitrophenol	840 U	67 %	52 %	840 U	840 U	840 U
4-Nitrophenol	840 U	88 %	88 %	840 U	840 U	840 U
Dibenzofuran	340 U	80 %	78 %	330 U	340 U	330 U
2,4-Dinitrotoluene	340 U	88 %	89 %	330 U	340 U	330 U
Diethylphthalate	340 U	81 %	82 %	330 U	340 U	330 U
4-Chlorophenyl-phenylether	340 U	78 %	77 %	330 U	340 U	330 U
Fluorene	340 U	80 %	79 %	330 U	340 U	330 U
4-Nitroaniline	840 U	83 %	88 %	840 U	840 U	840 U
4,6-Dinitro-2-methylphenol	840 U	98 %	89 %	840 U	840 U	840 U
N-Nitrosodiphenylamine (1)	340 U	67 %	62 %	330 U	340 U	330 U
4-Bromophenyl-phenylether	340 U	75 %	70 %	330 U	340 U	330 U
Hexachlorobenzene	340 U	85 %	81 %	330 U	340 U	330 U
Pentachlorophenol	840 U	97 %	79 %	840 U	840 U	840 U
Phenanthrene	340 U	81 %	78 %	330 U	340 U	330 U
Anthracene	340 U	84 %	80 %	330 U	340 U	330 U
Carbazole	340 U	83 %	76 %	330 U	340 U	330 U
Di-n-butylphthalate	340 U	80 %	78 %	330 U	28 J	330 U
Fluoranthene	340 U	82 %	81 %	330 U	62 J	17 J
Pyrene	340 U	85 %	81 %	330 U	87 J	21 J
Butylbenzylphthalate	340 U	83 %	82 %	330 U	340 U	330 U
3,3'-Dichlorobenzidine	340 U	79 %	82 %	330 U	340 U	330 U
Benzo(a)anthracene	340 U	81 %	78 %	330 U	47 J	23 J
Chrysene	340 U	82 %	79 %	330 U	57 J	52 J
bis(2-Ethylhexyl)phthalate	660 ~~60~~ JB U	81 %	80 %	660 ~~42~~ JB U	660 ~~100~~ JB U	660 ~~45~~ JB U
Di-n-octyl phthalate	340 U	79 %	77 %	330 U	340 U	330 U
Benzo(b)fluoranthene	340 U	80 %	79 %	330 U	30 J	330 U
Benzo(k)fluoranthene	340 U	82 %	79 %	330 U	43 J	330 U
Benzo(a)pyrene	340 U	85 %	83 %	330 U	40 J	28 J
Indeno(1,2,3-cd)pyrene	340 U	91 %	87 %	330 U	18 J	330 U
Dibenz(a,h)anthracene	340 U	91 %	87 %	330 U	340 U	330 U
Benzo(g,h,i)perylene	340 U	90 %	86 %	330 U	21 J	41 J

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits. 9/14/06

000000008

000013

	Cust ID:	J12PW9	J12PX0	J12PX1	J12PX2	J12PX3	SBLKZZ
Sample Information	RFW#:	005	006	007	008	009	06LE0552-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	74 %	80 %	78 %	62 %	62 %	88 %
	2-Fluorobiphenyl	80 %	78 %	80 %	62 %	61 %	88 %
	Terphenyl-d14	61 %	94 %	87 %	66 %	79 %	116 %
	Phenol-d5	75 %	84 %	84 %	67 %	72 %	105 %
	2-Fluorophenol	71 %	79 %	78 %	65 %	65 %	92 %
	2,4,6-Tribromophenol	79 %	93 %	93 %	62 %	75 %	87 %
		fl	fl	fl	fl	fl	fl
Phenol		330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethyl)ether		330 U	330 U	330 U	330 U	330 U	330 U
2-Chlorophenol		330 U	330 U	330 U	330 U	330 U	330 U
1,3-Dichlorobenzene		330 U	330 U	330 U	330 U	330 U	330 U
1,4-Dichlorobenzene		330 U	330 U	330 U	330 U	330 U	330 U
1,2-Dichlorobenzene		330 U	330 U	330 U	330 U	330 U	330 U
2-Methylphenol		330 U	330 U	330 U	330 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		330 U	330 U	330 U	330 U	330 U	330 U
4-Methylphenol		330 U	330 U	330 U	330 U	330 U	330 U
N-Nitroso-di-n-propylamine		330 U	330 U	330 U	330 U	330 U	330 U
Hexachloroethane		330 U	330 U	330 U	330 U	330 U	330 U
Nitrobenzene		330 U	330 U	330 U	330 U	330 U	330 U
Isophorone		330 U	330 U	330 U	330 U	330 U	330 U
2-Nitrophenol		330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dimethylphenol		330 U	330 U	330 U	330 U	330 U	330 U
bis(2-Chloroethoxy)methane		330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dichlorophenol		330 U	330 U	330 U	330 U	330 U	330 U
1,2,4-Trichlorobenzene		330 U	330 U	330 U	330 U	330 U	330 U
Naphthalene		330 U	330 U	330 U	330 U	330 U	330 U
4-Chloroaniline		330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorobutadiene		330 U	330 U	330 U	330 U	330 U	330 U
4-Chloro-3-methylphenol		330 U	330 U	330 U	330 U	330 U	330 U
2-Methylnaphthalene		330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorocyclopentadiene		330 U	330 U	330 U	330 U	330 U	330 U
2,4,6-Trichlorophenol		330 U	330 U	330 U	330 U	330 U	330 U
2,4,5-Trichlorophenol		830 U	840 U	830 U	830 U	830 U	830 U

*= Outside of EPA CLP QC limits.

9/14/06

000014

600000000

Cust ID:	J12FW9	J12FX0	J12FX1	J12FX2	J12FX3	SBLK22
RFW#:	005	006	007	008	009	06LE0552-MB1
2-Chloronaphthalene	330 U	330 U	330 U	330 U	330 U	330 U
2-Nitroaniline	830 U	840 U	830 U	830 U	830 U	830 U
Dimethylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
Acenaphthylene	330 U	330 U	330 U	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
3-Nitroaniline	830 U	840 U	830 U	830 U	830 U	830 U
Acenaphthene	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dinitrophenol	830 U	840 U	830 U	830 U	830 U	830 U
4-Nitrophenol	830 U	840 U	830 U	830 U	830 U	830 U
Dibenzofuran	330 U	330 U	330 U	330 U	330 U	330 U
2,4-Dinitrotoluene	330 U	330 U	330 U	330 U	330 U	330 U
Diethylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
4-Chlorophenyl-phenylether	330 U	330 U	330 U	330 U	330 U	330 U
Fluorene	330 U	330 U	330 U	330 U	330 U	330 U
4-Nitroaniline	830 U	840 U	830 U	830 U	830 U	830 U
4,6-Dinitro-2-methylphenol	830 U	840 U	830 U	830 U	830 U	830 U
N-Nitrosodiphenylamine (1)	330 U	330 U	330 U	330 U	330 U	330 U
4-Bromophenyl-phenylether	330 U	330 U	330 U	330 U	330 U	330 U
Hexachlorobenzene	330 U	330 U	330 U	330 U	330 U	330 U
Pentachlorophenol	830 U	840 U	830 U	830 U	830 U	830 U
Phenanthrene	330 U	330 U	330 U	330 U	330 U	330 U
Anthracene	330 U	330 U	330 U	330 U	330 U	330 U
Carbazole	330 U	330 U	330 U	330 U	330 U	330 U
Di-n-butylphthalate	330 U	21 J	330 U	330 U	330 U	330 U
Fluoranthene	17 J	330 U	330 U	330 U	330 U	330 U
Pyrene	25 J	330 U	330 U	330 U	330 U	330 U
Butylbenzylphthalate	330 U	330 U	330 U	330 U	330 U	330 U
3,3'-Dichlorobenzidine	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(a)anthracene	21 J	330 U	330 U	330 U	330 U	330 U
Chrysene	100 J	330 U	330 U	330 U	330 U	330 U
bis(2-Ethylhexyl)phthalate	660 ~~52~~ 9/14/α JBU	660 ~~30~~ 9/14/α JBU	660 ~~28~~ 9/14/α JBU	660 ~~17~~ 9/14/α JB U	660 ~~25~~ 9/14/α JB U	20 J
Di-n-octyl phthalate	330 U	330 U	330 U	330 U	330 U	330 U
Benzo(b)fluoranthene	55 J	330 U	330 U	330 U	330 U	330 U
Benzo(k)fluoranthene	25 J	330 U	330 U	330 U	330 U	330 U
Benzo(a)pyrene	53 J	330 U	330 U	330 U	330 U	330 U
Indeno(1,2,3-cd)pyrene	50 J	330 U	330 U	330 U	330 U	330 U
Dibenz(a,h)anthracene	56 J	330 U	330 U	330 U	330 U	330 U
Benzo(g,h,i)perylene	90 J	330 U	330 U	330 U	330 U	330 U

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

R 9/14/α

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Cust ID: SBLKZZ BS

Sample Information

RFW#: 06LE0552-MB1
Matrix: SOIL
D.F.: 1.00
Units: ug/Kg

Surrogate Recovery	Nitrobenzene-d5	62	%
	2-Fluorobiphenyl	68	%
	Terphenyl-d14	67	%
	Phenol-d5	74	%
	2-Fluorophenol	65	%
	2,4,6-Tribromophenol	68	%

Phenol	71	%
bis(2-Chloroethyl)ether	67	%
2-Chlorophenol	70	%
1,3-Dichlorobenzene	65	%
1,4-Dichlorobenzene	62	%
1,2-Dichlorobenzene	65	%
2-Methylphenol	69	%
2,2'-oxybis(1-Chloropropane)	65	%
4-Methylphenol	70	%
N-Nitroso-di-n-propylamine	74	%
Hexachloroethane	60	%
Nitrobenzene	65	%
Isophorone	74	%
2-Nitrophenol	66	%
2,4-Dimethylphenol	59	%
bis(2-Chloroethoxy)methane	69	%
2,4-Dichlorophenol	70	%
1,2,4-Trichlorobenzene	65	%
Naphthalene	68	%
4-Chloroaniline	78	%
Hexachlorobutadiene	73	%
4-Chloro-3-methylphenol	77	%
2-Methylnaphthalene	72	%
Hexachlorocyclopentadiene	70	%
2,4,6-Trichlorophenol	76	%
2,4,5-Trichlorophenol	79	%

*= Outside of EPA CLP QC limits.

9/14/06

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2-Chloronaphthalene	72	%
2-Nitroaniline	77	%
Dimethylphthalate	75	%
Acenaphthylene	78	%
2,6-Dinitrotoluene	77	%
3-Nitroaniline	90	%
Acenaphthene	72	%
2,4-Dinitrophenol	47	%
4-Nitrophenol	76	%
Dibenzofuran	74	%
2,4-Dinitrotoluene	83	%
Diethylphthalate	76	%
4-Chlorophenyl-phenylether	74	%
Fluorene	76	%
4-Nitroaniline	72	%
4,6-Dinitro-2-methylphenol	58	%
N-Nitrosodiphenylamine (1)	53	%
4-Bromophenyl-phenylether	62	%
Hexachlorobenzene	71	%
Pentachlorophenol	83	%
Phenanthrene	71	%
Anthracene	75	%
Carbazole	71	%
Di-n-butylphthalate	71	%
Fluoranthene	78	%
Pyrene	68	%
Butylbenzylphthalate	69	%
3,3'-Dichlorobenzidine	77	%
Benzo(a)anthracene	76	%
Chrysene	75	%
bis(2-Ethylhexyl)phthalate	72	%
Di-n-octyl phthalate	74	%
Benzo(b)fluoranthene	77	%
Benzo(k)fluoranthene	76	%
Benzo(a)pyrene	78	%
Indeno(1,2,3-cd)pyrene	69	%
Dibenz(a,h)anthracene	68	%
Benzo(g,h,i)perylene	68	%

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

9/14/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L426
SDG/SAF # K0465/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

SEMIVOLATILE

Nine (9) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 07-10-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 07-23,25,29,31-2006 and 08-01-2006.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.
2. The sample results were reported on a dry-weight basis.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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 7 pages.

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

LIONVILLE LABORATORY INC.

10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Judy Stone

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/14/06
Date

som\gorup\data\bna\tnu-hanford\0607-426.doc

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

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8U	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
FRC-03-103	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRS 7-3-06

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	G/P	aG	aG	G	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	256g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				
Sample No. / Matrix * / Sample Date / Sample Time										
J12P53 / SOIL / 06/29/06 / 0925	✓	✓	✓	✓	✓	✓				C-12
J12P54 / SOIL / 06/29/06 / 0928	✓	✓	✓	✓	✓	✓				C-11
J12P55 / SOIL / 06/29/06 / 0935	✓	✓	✓	✓	✓	✓				C-17
~~J12P56 / SOIL~~ / 06/29/06										

000021

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C. Martinez C. Martinez	06/29/06 1720	Received By/Stored In: 3728 3B	06/29/06 1720
Relinquished By/Removed From: 3728/3B	7/5/06 1000	Received By/Stored In: M Stankovich	7/5/06 1000
Relinquished By/Removed From: M Stankovich	7/5/06 1500	Received By/Stored In: FED EX	
Relinquished By/Removed From: FED EX	7-6-06 0930	Received By/Stored In: [illegible]	7-6-06 0930
Relinquished By/Removed From:		Received By/Stored In:	
Relinquished By/Removed From:		Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #3B on 7/5/06

Matrix *
S=Soil
SS=Sediment
SD=Solid
B=Badge
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

EHI-EE-011 (08/29/2005)

000000024

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8D	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-03-~~103~~ 103 no 7/5/06	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES/LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1
Volume	250g	120mL	250mL	120mL	250mL	250mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				
J12PY9	SOIL	06/29/06	1400	✓	✓	✓	✓	✓	✓				D2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A	7/5/06 0930	M Stankovich	7/5/06 0930
M Stankovich	7/5/06 1500	Fed Ex	
FedEx	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728
Ref # 3A on 7/5/06

Matrix *
S=Soil
SE=Sediment
SO=Sand
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 (08/29/2005)

000000025

000022

Collector: C. Martinez	Company Contact: C. Martinez	Telephone No.: 509-539-2816	Project Coordinator: KESSNER, JH
Project Designation: 100-BC Burial Grounds - Soil Full Protocol	Sampling Location: 128-B-3 (Upland/General/Tar)		SAF No.: RC-020
Ice Chest No.: ERC-02-006	Field Logbook No.: EFL 1173-8	COA: R128B32000	Method of Shipment: FED EX
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A060517		Bill of Lading/Air Bill No.: See OSPC

Price Code: 80 Data Turnaround

Air Quality: 21 days

000000026

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°c

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				

000023

Sample No.	Matrix *	Sample Date	Sample Time										
J12PW9	SOIL	06/29/06	0955	✓	✓	✓	✓	✓	✓				C-1
J12PX0	SOIL		0958	✓	✓	✓	✓	✓	✓				2
J12PX1	SOIL		1002	✓	✓	✓	✓	✓	✓				3
J12PX2	SOIL		1005	✓	✓	✓	✓	✓	✓				6
J12PX3	SOIL	06/29/06	1012	✓	✓	✓	✓	✓	✓				5

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From: C. Martinez / C. Martinez	Date/Time: 1720 06/29/06	Received By/Stored In: 3728 3A	Date/Time: 1720 06/29/06
Relinquished By/Removed From: 3728/3A	Date/Time: 7/5/06 0900	Received By/Stored In: MStankovich	Date/Time: 7/5/06 0900
Relinquished By/Removed From: WCH MStankovich	Date/Time: 7/5/06 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 7-6-06 0930	Received By/Stored In: [signature]	Date/Time: 7-6-06 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 3A on 7/5/06

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128-B-3			DATA PACKAGE: K0465		
VALIDATOR: TLI		LAB: LLI		DATE: 9/10/06	
			SDG: K0465		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J12P53	J12P54	J12P55	J12PY9	J12PW9	
J12PX0	J12PX1	J12PX2	J12PX3		
					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: MB - bis(2-ethylhexyl) phthalate - U at RQL

no FB

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

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

Comments: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

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

Comments:

7. HOLDING TIMES (all levels)

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analyses? ..... Yes No N/A
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: 72 over

9. SAMPLE CLEANUP (Levels D and E)

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

Comments:

Date: 15 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol – Waste Site 128-B-3
Subject: Pesticide - Data Package No. K0465-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0465 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J12P53	6/29/06	Soil	C	Pesticides by 8081A
J12P54	6/29/06	Soil	C	Pesticides by 8081A
J12P55	6/29/06	Soil	C	Pesticides by 8081A
J12PY9	6/29/06	Soil	C	Pesticides by 8081A
J12PW9	6/29/06	Soil	C	Pesticides by 8081A
J12PX0	6/29/06	Soil	C	Pesticides by 8081A
J12PX1	6/29/06	Soil	C	Pesticides by 8081A
J12PX2	6/29/06	Soil	C	Pesticides by 8081A
J12PX3	6/29/06	Soil	C	Pesticides by 8081A

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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 results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 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 lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy 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 surrogate recoveries outside QC limits (120% and 128%), the endrin aldehyde result in sample J12P55 was qualified as an estimate 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 lack of a matrix spike or matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other precision results were acceptable.

Field Duplicate Samples

No field duplicate samples were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data Package No. K0465 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to the lack of a matrix spike, matrix spike duplicate or LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

- Due to surrogate recoveries outside QC limits (120% and 128%), the endrin aldehyde result in sample J12P55 was qualified as an estimate and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH 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 toxaphene results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

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

PESTICIDE DATA QUALIFICATION SUMMARY*

SDG: K0465	REVIEWER: TLL	Project: 128-B-3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Endrin aldehyde	J	J12P55	Surrogate recovery
Toxaphene	J	All	No MS/MSD/LCS analysis

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: WASHINGTON CLOSURE HANFORD																			
Laboratory: LLI	SDG: K0465																		
Sample Number		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Extraction Date		7/7/06		7/7/06		7/7/06		7/7/06		7/7/06		7/7/06		7/7/06		7/7/06		7/7/06	
Analysis Date		7/18/06		7/18/06		7/18/06		7/18/06		7/18/06		7/18/06		7/18/06		7/18/06		7/18/06	
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Gamma-BHC (Lindane)	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Beta-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Heptachlor	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Delta-BHC	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Aldrin	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	0.37		1.3	U	1.3	U	1.3	U
Heptachlor Epoxide	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
gamma-Chlordane	5	1.3	U	1.3	U	1.3	U	0.83		1.3	U	1.3	U	0.33		1.3	U	1.3	U
Endosulfan I	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
alpha-Chlordane	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDE	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	15		1.3	U	1.3	U	1.3	U
Dieldrin	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Endrin	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDD	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Endosulfan II	5	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
4,4'-DDT	5	1.3	U	1.3	U	1.3	U	15		7.0		1.3	U	1.3	U	1.3	U	1.3	U
Endrin Aldehyde	5	1.3	U	1.3	U	1.8	J	0.93		1.9		5.3		1.3	U	1.3	U	1.3	U
Endosulfan sulfate	5	1.3	U	1.3	U	1.3	U	1.3	U	2.7		1.3	U	1.3	U	1.3	U	1.3	U
Methoxyclor	5	1.3	U	1.3	U	1.3	U	3.5		4.2		1.3	U	1.3	U	1.3	U	1.3	U
Endrin Ketone	5	1.3	U	1.3	U	1.3	U	1.3	U	0.90		1.3	U	1.3	U	1.3	U	1.3	U
Toxaphene	5	13	UJ	13	UJ	13	UJ	13	UJ	13	UJ	13	UJ	13	UJ	13	UJ	13	UJ

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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.

RFW Batch Number: 0607L426 Client: TNUHANFORD RC-020 K0465 Work Order: 11343606001 Page: 1

Sample Information						
Cust ID:	J12P53	J12P53	J12P53	J12P54	J12P55	J12PY9
RFW#:	001	001 MS	001 MSD	002	003	004
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:	4.00	4.00	4.00	4.00	4.00	4.00
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG

Surrogate: Tetrachloro-m-xylene	92	%	102	%	106	%	122 *	%	120 *	%	106	%
Decachlorobiphenyl	105	%	113	%	109	%	122	%	128 *	%	114	%
		fl		fl		fl		fl		fl		fl
Alpha-BHC	1.3	U	83	%	78	%	1.3	U	1.3	U	1.3	U
gamma-BHC (Lindane)	1.3	U	97	%	89	%	1.3	U	1.3	U	1.3	U
Beta-BHC	1.3	U	95	%	86	%	1.3	U	1.3	U	1.3	U
Heptachlor	1.3	U	82	%	86	%	1.3	U	1.3	U	1.3	U
Delta-BHC	1.3	U	68	%	60	%	1.3	U	1.3	U	1.3	U
Aldrin	1.3	U	96	%	89	%	1.3	U	1.3	U	1.3	U
Heptachlor epoxide	1.3	U	99	%	90	%	1.3	U	1.3	U	1.3	U
gamma-Chlordane	1.3	U	98	%	88	%	1.3	U	1.3	U	0.83	J.I
Endosulfan I	1.3	U	99	%	91	%	1.3	U	1.3	U	1.3	U
alpha-Chlordane	1.3	U	100	%	92	%	1.3	U	1.3	U	1.3	U
4,4'-DDE	1.3	U	78	%	73	%	1.3	U	1.3	U	1.3	U
Dieldrin	1.3	U	82	%	73	%	1.3	U	1.3	U	1.3	U
Endrin	1.3	U	84	%	82	%	1.3	U	1.3	U	1.3	U
4,4'-DDD	1.3	U	74	%	72	%	1.3	U	1.3	U	1.3	U
Endosulfan II	1.3	U	101	%	92	%	1.3	U	1.3	U	1.3	U
4,4'-DDT	1.3	U	88	%	83	%	1.3	U	1.3	U	15	
Endrin aldehyde	1.3	U	83	%	69	%	1.3	U	1.8	J	0.93	J.I
Endosulfan sulfate	1.3	U	94	%	85	%	1.3	U	1.3	U	1.3	U
Methoxychlor	1.3	U	69	%	66	%	1.3	U	1.3	U	3.5	
Endrin ketone	1.3	U	109	%	96	%	1.3	U	1.3	U	1.3	U
Toxaphene	13	UJ	13	U	13	U	13	UJ	13	UJ	13	UJ

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

9/14/06 7/24/06

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RFW Batch Number: 0607L426 Client: TNUHANFORD RC-020 K0465 Work Order: 11343606001 Page: 2

	Cust ID:	J12PW9	J12PX0	J12PX1	J12PX2	J12PX3	PBLKLD
Sample Information	RFW#:	005	006	007	008	009	06LE0550-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	4.00	4.00	4.00	4.00	4.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	99 %	95 %	118 %	103 %	108 %	92 %
	Decachlorobiphenyl	95 %	91 %	103 %	89 %	96 %	96 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
gamma-BHC (Lindane)		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Beta-BHC		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Heptachlor		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Delta-BHC		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Aldrin		1.3 U	0.37 J.I	1.3 U	1.3 U	1.3 U	0.33 U
Heptachlor epoxide		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
gamma-Chlordane		1.3 U	1.3 U	0.33 J	1.3 U	1.3 U	0.33 U
Endosulfan I		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
alpha-Chlordane		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
4,4'-DDE		1.3 U	15	1.3 U	1.3 U	1.3 U	0.33 U
Dieldrin		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Endrin		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
4,4'-DDD		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Endosulfan II		1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
4,4'-DDT		7.0	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Endrin aldehyde		1.9	5.3 .I	1.3 U	1.3 U	1.3 U	0.33 U
Endosulfan sulfate		2.7	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Methoxychlor		4.2 .I	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Endrin ketone		0.90 J.I	1.3 U	1.3 U	1.3 U	1.3 U	0.33 U
Toxaphene		13 U J	13 U J	13 U J	13 U J	13 U J	3.3 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

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Cust ID: PBLKLD BS

Sample Information

RFW#: 06LE0550-MB1
Matrix: SOIL
D.F.: 1.00
Units: UG/KG

Surrogate:	Tetrachloro-m-xylene	98	%
	Decachlorobiphenyl	102	%

Alpha-BHC	96	%
gamma-BHC (Lindane)	104	%
Beta-BHC	101	%
Heptachlor	96	%
Delta-BHC	86	%
Aldrin	106	%
Heptachlor epoxide	105	%
gamma-Chlordane	106	%
Endosulfan I	106	%
alpha-Chlordane	105	%
4,4'-DDE	95	%
Dieldrin	100	%
Endrin	106	%
4,4'-DDD	89	%
Endosulfan II	104	%
4,4'-DDT	103	%
Endrin aldehyde	91	%
Endosulfan sulfate	104	%
Methoxychlor	103	%
Endrin ketone	102	%
Toxaphene	3.3	U

9/14/06

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

9/21/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0607L426
SDG/SAF # K0465/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 07-06-2006

CHLORINATED PESTICIDES

Nine (9) soil samples were collected on 06-29-2006.

The samples and their associated QC samples were extracted on 07-07-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 07-18-006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were extracted and analyzed within required holding time.
2. All sample results were reported on a wet-weight basis.
3. The samples and their associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
4. The method blank was below the reporting limits for all target compounds.
5. Three (3) of twenty-six (26) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All samples required a 4-fold instrument dilution due to the nature of the sample matrix. The reporting limits were adjusted to reflect the necessary dilution.
9. The initial calibrations associated with this data set 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 1 3 pages.

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

LIONVILLE LABORATORY INC.

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

11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/3/16
Date

som\r:\group\data\pest\mu hanford\0607-426.pst

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06GC314

Initiator: Eric Laager
Date: 7/17/06
Client: TNU

Batch: 06074426
Samples: 3
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: Soil
Prep Batch: 06LE0550

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 Surrogate recoveries above established criterion in sample 3. exceed acceptance

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

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

Other Description:

Narrate - minimal impact to data quantitation; surrogate recoveries exceed criteria by +2-6%.

4. Project Manager Instructions...signature/date: 7/23/06

__ 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: 7/24/06

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	__	__ GC/LC: Kiger
__	__ Data Management: Stilwell	__	__ MS: Rychlak/Daley
__	__ Sample Prep: Beegle/Kiger	__	__ Log-In: Perry
		__	__ Admin: _____
		__	__ Other: _____

QA-105-A-0805

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8D	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
FRC-03-103	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A0605518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool 4°C

SAMPLE ANALYSIS

Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container				G/P	sG	sG	G	sG	sG			
No. of Container(s)				1	1	1	1	1	1			
Volume				250g	120mL	250mL	120mL	250mL	250mL			
				See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time									
J12P53	SOIL	06/29/06	0925	✓	✓	✓	✓	✓	✓			C-12
J12P54	SOIL		0928	✓	✓	✓	✓	✓	✓			C-11
J12P55	SOIL	06/29/06	0935	✓	✓	✓	✓	✓	✓			C-17
~~J12P56~~	~~SOIL~~	06/29/06										

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CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C Martinez C Martinez	06/29/06 1720	3728 3B	06/29/06 1720
3728/3B	7/5/06 1000	M Stankovich	7/5/06 1000
M Stankovich	7/5/06 1600	FED EX	
FED EX	7-6-06 0930		7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc], Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #3B on 7/5/06

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 (08/29/2005)

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8D	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
~~ME~~ 7/5/06 ERC-03-~~[illegible]~~103	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES/LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C					
Type of Container	aG	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1	1					
Volume	250g	120mL	250mL	120mL	250mL	250mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1					
Sample No.	Matrix *	Sample Date	Sample Time								
J12PY9	SOIL	06/29/06	1400	✓	✓	✓	✓	✓	✓		02

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez/C. Martinez 06/29/06 3728	1720	3A	1720 06/29/06
3728/3A	7/5/06 0930	M Stankovich	7/5/06 0930
M Stankovich	7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 3A on 7/5/06

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
O-Other

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

BHI-EE-011 (08/29/2005)

000000011

000000020

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code 80	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH		
Project Designation 100-BC Burial Grounds - Soil Full Protocol	**Sampling Location** 128-B-3 (Upland/General/Tar)		**SAF No.** RC-020	Air Quality	21 days
Ice Chest No. ERC-02-006	**Field Logbook No.** EFL1173-8	**COA** R128B32000	**Method of Shipment** FED EX		
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** A060517		**Bill of Lading/Air Bill No.** See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

0000021

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation: None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container				aG	aG	aG	aG	aG	aG				
No. of Container(s)				1	1	1	1	1	1				
Volume				250g	120mL	250mL	120mL	250mL	250mL				
				See item (1) in Special Instructions	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				
J12PW9	SOIL	06/29/06	0955	✓	✓	✓	✓	✓	✓				C-1
J12PX0	SOIL		0958	✓	✓	✓	✓	✓	✓				2
J12PX1	SOIL		1002	✓	✓	✓	✓	✓	✓				3
J12PX2	SOIL		1005	✓	✓	✓	✓	✓	✓				6
J12PX3	SOIL	06/29/06	1012	✓	✓	✓	✓	✓	✓				5

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Martinez / S. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A 7/5/06	0900	M. Stankovich	7/5/06 0900
M. Stankovich	7/5/06 0900	Fed Ex	
Fed Ex 7-6-06	0930		7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref # 3A on 7/5/06

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

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

BHI-EE-011 (08/29/2005)

0000012

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 128-B-3			DATA PACKAGE: K046S		
VALIDATOR: TLI		LAB: LLI		DATE: 9/10/06	
			SDG: K046S		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J12P53	J12P54	J12P55	J12PY9	J12PW9	
J12PX0	J12PX1	J12PX2	J12PX3		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: 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: Surr DCB - J all detects no PAS

PSS (endrin aldehyde)

no toxaphene MS/MSD/LCS - J all

PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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

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

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

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

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

Comments: all toxaphene over

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

GPC check recoveries acceptable? ..... Yes No N/A

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

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

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 15 September 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 128-B-3
Subject: Inorganic - Data Package No. K0465-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0465 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J12P53	6/29/06	Soil	C	See note 1
J12P54	6/29/06	Soil	C	See note 1
J12P55	6/29/06	Soil	C	See note 1
J12PY9	6/29/06	Soil	C	See note 1
J12PW9	6/29/06	Soil	C	See note 1
J12PX0	6/29/06	Soil	C	See note 1
J12PX1	6/29/06	Soil	C	See note 1
J12PX2	6/29/06	Soil	C	See note 1
J12PX3	6/29/06	Soil	C	See note 1

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

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less

than the IDL, no qualification is required.

Due to a matrix spike recovery outside QC limits (49.8%), all antimony results were qualified as estimates and flagged "J".

Due to an LCS recovery outside QC limits (53.8%), all silicon results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All undetected selenium and silver results exceeded the RQL. All selenium results exceeded the RQL. Under the WCH statement of work, no qualification is required. All other results met the RQL.

- **Completeness**

Data package No. K0465 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recovery outside QC limits (49.8%), all antimony results were qualified as estimates and flagged "J".
- Due to an LCS recovery outside QC limits (53.8%), all silicon results were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under the WCH statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All selenium results exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

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

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WCH 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

METALS DATA QUALIFICATION SUMMARY*

SDG: K0465	REVIEWER: TL	Project: 128.B.3	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All	MS recovery
Silicon	J	All	LCS recovery

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

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: WASHINGTON CLOSURE HANFORD																			
Lab: LLI	SDG: K0465																		
Sample Numbe		J12P53		J12P54		J12P55		J12PY9		J12PW9		J12PX0		J12PX1		J12PX2		J12PX3	
Remarks																			
Sample Date		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06		6/29/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.30		0.20	U	0.20	U
Aluminum		6930		6330		10700		7520		7460		7120		7490		6970		7070	
Arsenic	10	2.2		2.4		6.7		2.7		2.2		2.4		2.8		2.7		2.3	
Boron		3.3		1.5		6.0		2.9		3.2		2.2		2.1		1.7		2.5	
Barium	2	89.7		81.0		148		94.6		88.9		91.8		91.0		84.0		83.7	
Beryllium		0.35		0.32		0.55		0.37		0.41		0.39		0.40		0.39		0.38	
Calcium		3240		3280		6860		3990		3770		3990		4010		3470		3620	
Cadmium	0.2	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Cobalt		7.4		6.8		10.9		8.3		7.8		7.4		7.3		7.1		7.1	
Chromium	1	11.5		10.1		28.2		13.0		11.3		11.2		12.5		11.1		11.8	
Copper		13.5		13.3		27.7		16.9		14.0		14.0		15.6		13.2		12.5	
Iron		16900		15800		26400		19000		18200		17100		18000		17100		17700	
Mercury	0.2	0.02	U	0.01	U	0.08		0.10		0.07		0.02		0.02	U	0.01	U	0.02	U
Potassium		1570		1390		2070		1570		1960		1890		1870		1640		1960	
Magnesium		3820		3660		6520		4630		4020		3910		4400		3930		3760	
Manganese		365		325		463		382		382		371		340		334		352	
Molybdenum		0.85	U	0.85	U	0.84	U	0.83	U	0.84	U	0.83	U	0.84	U	0.83	U	0.83	U
Sodium		110		106		205		146		122		122		132		99.0		111	
Nickel		11.2		10.6		18.0		13.8		11.7		11.2		12.8		11.2		10.9	
Lead	5	5.0		4.5		8.9		7.6		7.2		6.4		6.2		5.4		5.5	
Antimony		1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Selenium	1	1.4	U	1.4	U	1.4	U	1.3	U	1.4	U	1.3	U	1.4	U	1.3	U	1.3	U
Silicon		570	J	494	J	437	J	481	J	516	J	582	J	455	J	487	J	472	J
Vanadium		34.6		32.2		57.9		37.3		36.3		35.8		38.5		37.3		35.5	
Zinc	1	37.5		34.7		78.6		47.3		47.5		43.3		45.3		37.2		40.8	

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 07/25/06

CLIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
001	J12P52	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	6930	MG/KG	8.4	3.0
		Arsenic, Total	2.2	MG/KG	1.8	3.0
		Boron, Total	3.3	MG/KG	0.70	3.0
		Barium, Total	89.7	MG/KG	0.06	3.0
		Beryllium, Total	0.25	MG/KG	0.06	3.0
		Calcium, Total	3240	MG/KG	4.8	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.4	MG/KG	0.41	3.0
		Chromium, Total	11.5	MG/KG	0.38	3.0
		Copper, Total	13.5	MG/KG	0.25	3.0
		Iron, Total	16900	MG/KG	10.2	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1570	MG/KG	6.6	3.0
		Magnesium, Total	3820	MG/KG	2.8	3.0
		Manganese, Total	365	MG/KG	0.09	3.0
		Molybdenum, Total	0.85 u	MG/KG	0.85	3.0
		Sodium, Total	110	MG/KG	2.2	3.0
		Nickel, Total	11.2	MG/KG	0.70	3.0
		Lead, Total	5.0	MG/KG	0.91	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.4 u	MG/KG	1.4	3.0
		Silicon, Total	570 J	MG/KG	6.6	3.0
		Vanadium, Total	34.6	MG/KG	0.26	3.0
		Zinc, Total	37.5	MG/KG	0.47	3.0

R
9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
002	J12P54	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	6330	MG/KG	8.4	3.0
		Arsenic, Total	2.4	MG/KG	1.8	3.0
		Boron, Total	1.5	MG/KG	0.70	3.0
		Barium, Total	81.0	MG/KG	0.06	3.0
		Beryllium, Total	0.32	MG/KG	0.06	3.0
		Calcium, Total	3280	MG/KG	4.8	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	6.8	MG/KG	0.41	3.0
		Chromium, Total	10.1	MG/KG	0.38	3.0
		Copper, Total	13.3	MG/KG	0.35	3.0
		Iron, Total	15800	MG/KG	10.2	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1390	MG/KG	6.6	3.0
		Magnesium, Total	3660	MG/KG	2.8	3.0
		Manganese, Total	325	MG/KG	0.09	3.0
		Molybdenum, Total	0.85 u	MG/KG	0.85	3.0
		Sodium, Total	106	MG/KG	2.2	3.0
		Nickel, Total	10.6	MG/KG	0.70	3.0
		Lead, Total	4.5	MG/KG	0.90	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.4 u	MG/KG	1.4	3.0
		Silicon, Total	494 J	MG/KG	6.6	3.0
		Vanadium, Total	32.2	MG/KG	0.26	3.0
		Zinc, Total	34.7	MG/KG	0.47	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
003	J12P55	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	10700	MG/KG	8.4	3.0
		Arsenic, Total	6.7	MG/KG	1.8	3.0
		Boron, Total	6.0	MG/KG	0.70	3.0
		Barium, Total	148	MG/KG	0.06	3.0
		Beryllium, Total	0.85	MG/KG	0.06	3.0
		Calcium, Total	6860	MG/KG	4.8	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	10.9	MG/KG	0.41	3.0
		Chromium, Total	28.2	MG/KG	0.38	3.0
		Copper, Total	27.7	MG/KG	0.35	3.0
		Iron, Total	26400	MG/KG	10.1	3.0
		Mercury, Total	0.08	MG/KG	0.02	1.0
		Potassium, Total	2070	MG/KG	6.6	3.0
		Magnesium, Total	6520	MG/KG	2.8	3.0
		Manganese, Total	463	MG/KG	0.05	3.0
		Molybdenum, Total	0.84 u	MG/KG	0.84	3.0
		Sodium, Total	205	MG/KG	2.2	3.0
		Nickel, Total	18.0	MG/KG	0.70	3.0
		Lead, Total	8.9	MG/KG	0.90	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.4 u	MG/KG	1.4	3.0
		Silicon, Total	437 J	MG/KG	6.6	3.0
		Vanadium, Total	57.9	MG/KG	0.26	3.0
		Zinc, Total	78.6	MG/KG	0.46	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

JENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
04	J12PY9	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	7520	MG/KG	8.3	3.0
		Arsenic, Total	2.7	MG/KG	1.7	3.0
		Boron, Total	2.9	MG/KG	0.69	3.0
		Barium, Total	94.6	MG/KG	0.06	3.0
		Beryllium, Total	0.37	MG/KG	0.06	3.0
		Calcium, Total	3990	MG/KG	4.7	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	8.3	MG/KG	0.40	3.0
		Chromium, Total	13.0	MG/KG	0.37	3.0
		Copper, Total	16.9	MG/KG	0.34	3.0
		Iron, Total	19000	MG/KG	10.0	3.0
		Mercury, Total	0.10	MG/KG	0.01	1.0
		Potassium, Total	1570	MG/KG	6.5	3.0
		Magnesium, Total	4630	MG/KG	2.8	3.0
		Manganese, Total	382	MG/KG	0.09	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	146	MG/KG	2.2	3.0
		Nickel, Total	13.8	MG/KG	0.69	3.0
		Lead, Total	7.6	MG/KG	0.89	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	481 J	MG/KG	6.5	3.0
		Vanadium, Total	37.3	MG/KG	0.26	3.0
		Zinc, Total	47.2	MG/KG	0.46	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
005	J12PW9	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	7460	MG/KG	8.4	3.0
		Arsenic, Total	2.2	MG/KG	1.8	3.0
		Boron, Total	3.2	MG/KG	0.70	3.0
		Barium, Total	88.9	MG/KG	0.06	3.0
		Beryllium, Total	0.41	MG/KG	0.06	3.0
		Calcium, Total	2770	MG/KG	4.8	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.8	MG/KG	0.41	3.0
		Chromium, Total	11.3	MG/KG	0.38	3.0
		Copper, Total	14.0	MG/KG	0.35	3.0
		Iron, Total	18200	MG/KG	10.2	3.0
		Mercury, Total	0.07	MG/KG	0.02	1.0
		Potassium, Total	1960	MG/KG	6.6	3.0
		Magnesium, Total	4020	MG/KG	2.8	3.0
		Manganese, Total	382	MG/KG	0.09	3.0
		Molybdenum, Total	0.84 u	MG/KG	0.84	3.0
		Sodium, Total	122	MG/KG	2.2	3.0
		Nickel, Total	11.7	MG/KG	0.70	3.0
		Lead, Total	7.2	MG/KG	0.90	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.4 u	MG/KG	1.4	3.0
		Silicon, Total	516 J	MG/KG	6.6	3.0
		Vanadium, Total	36.3	MG/KG	0.26	3.0
		Zinc, Total	47.5	MG/KG	0.47	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
06	J12PX0	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	7120	MG/KG	8.3	3.0
		Arsenic, Total	2.4	MG/KG	1.7	3.0
		Boron, Total	2.2	MG/KG	0.69	3.0
		Barium, Total	91.8	MG/KG	0.06	3.0
		Beryllium, Total	0.39	MG/KG	0.06	3.0
		Calcium, Total	3990	MG/KG	4.7	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.4	MG/KG	0.40	3.0
		Chromium, Total	11.2	MG/KG	0.37	3.0
		Copper, Total	14.0	MG/KG	0.34	3.0
		Iron, Total	17100	MG/KG	10.0	3.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1890	MG/KG	6.5	3.0
		Magnesium, Total	3910	MG/KG	2.8	3.0
		Manganese, Total	371	MG/KG	0.09	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	122	MG/KG	2.2	3.0
		Nickel, Total	11.2	MG/KG	0.69	3.0
		Lead, Total	6.4	MG/KG	0.89	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	582 J	MG/KG	6.5	3.0
		Vanadium, Total	38.8	MG/KG	0.26	3.0
		Zinc, Total	43.3	MG/KG	0.46	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

,IENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
107	J12PX1	Silver, Total	0.30		MG/KG	0.20	3.0
		Aluminum, Total	7490		MG/KG	8.3	3.0
		Arsenic, Total	2.8		MG/KG	1.8	3.0
		Boron, Total	2.1		MG/KG	0.69	3.0
		Barium, Total	91.0		MG/KG	0.06	3.0
		Beryllium, Total	0.40		MG/KG	0.06	3.0
		Calcium, Total	4010		MG/KG	4.7	3.0
		Cadmium, Total	0.20	u	MG/KG	0.20	3.0
		Cobalt, Total	7.3		MG/KG	0.40	3.0
		Chromium, Total	12.5		MG/KG	0.38	3.0
		Copper, Total	15.6		MG/KG	0.35	3.0
		Iron, Total	18000		MG/KG	10.1	3.0
		Mercury, Total	0.02	u	MG/KG	0.02	1.0
		Potassium, Total	1870		MG/KG	6.6	3.0
		Magnesium, Total	4400		MG/KG	2.8	3.0
		Manganese, Total	340		MG/KG	0.09	3.0
		Molybdenum, Total	0.84	u	MG/KG	0.84	3.0
		Sodium, Total	132		MG/KG	2.2	3.0
		Nickel, Total	12.8		MG/KG	0.69	3.0
		Lead, Total	6.2		MG/KG	0.90	3.0
		Antimony, Total	1.3	uJ	MG/KG	1.3	3.0
		Selenium, Total	1.4	u	MG/KG	1.4	3.0
		Silicon, Total	455	J	MG/KG	6.6	3.0
		Vanadium, Total	38.5		MG/KG	0.26	3.0
		Zinc, Total	45.3		MG/KG	0.46	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

:IENT: TNUHANFORD RC-020 K0465

LVL LOT #: 0607L426

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
08	J12PX2	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	6970	MG/KG	8.2	3.0
		Arsenic, Total	2.7	MG/KG	1.7	3.0
		Boron, Total	1.7	MG/KG	0.69	3.0
		Barium, Total	84.0	MG/KG	0.06	3.0
		Beryllium, Total	0.39	MG/KG	0.06	3.0
		Calcium, Total	3470	MG/KG	4.7	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.1	MG/KG	0.40	3.0
		Chromium, Total	11.1	MG/KG	0.37	3.0
		Copper, Total	13.3	MG/KG	0.34	3.0
		Iron, Total	17100	MG/KG	10	3.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	1640	MG/KG	6.5	3.0
		Magnesium, Total	3930	MG/KG	2.8	3.0
		Manganese, Total	334	MG/KG	0.09	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	99.0	MG/KG	2.2	3.0
		Nickel, Total	11.2	MG/KG	0.69	3.0
		Lead, Total	5.4	MG/KG	0.89	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.3 u	MG/KG	1.3	3.0
		Silicon, Total	487 J	MG/KG	6.5	3.0
		Vanadium, Total	37.3	MG/KG	0.26	3.0
		Zinc, Total	37.2	MG/KG	0.46	3.0

9/14/06

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
09	J12PX3	Silver, Total	0.20 u	MG/KG	0.20	3.0
		Aluminum, Total	7070	MG/KG	8.2	3.0
		Arsenic, Total	2.3	MG/KG	1.7	3.0
		Boron, Total	2.5	MG/KG	0.69	3.0
		Barium, Total	83.7	MG/KG	0.06	3.0
		Beryllium, Total	0.38	MG/KG	0.06	3.0
		Calcium, Total	3620	MG/KG	4.7	3.0
		Cadmium, Total	0.20 u	MG/KG	0.20	3.0
		Cobalt, Total	7.1	MG/KG	0.40	3.0
		Chromium, Total	11.8	MG/KG	0.37	3.0
		Copper, Total	12.5	MG/KG	0.34	3.0
		Iron, Total	17700	MG/KG	10	3.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1960	MG/KG	6.5	3.0
		Magnesium, Total	3760	MG/KG	2.8	3.0
		Manganese, Total	352	MG/KG	0.09	3.0
		Molybdenum, Total	0.83 u	MG/KG	0.83	3.0
		Sodium, Total	111	MG/KG	2.2	3.0
		Nickel, Total	10.9	MG/KG	0.69	3.0
		Lead, Total	5.5	MG/KG	0.89	3.0
		Antimony, Total	1.3 u J	MG/KG	1.3	3.0
		Selenium, Total	1.3 u J	MG/KG	1.3	3.0
		Silicon, Total	472	MG/KG	6.5	3.0
		Vanadium, Total	35.5	MG/KG	0.26	3.0
		Zinc, Total	40.8	MG/KG	0.46	3.0

9/14/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0607L426
SDG/SAF#: K0465/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 07-06-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

1. This narrative covers the analyses of 9 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples were reported with 3-fold dilutions for ICP metals due to sample matrix.

3. All analyses were performed within the required holding times.

4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

6. 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.

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

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 53.8%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

9. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 34 pages.

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

10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J12P53	Aluminum	66,000	96.7
	Iron	66,000	101.9
	Manganese	6,000	100.3
	Antimony	300	98.4
	Silicon	6,300	98.0

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 a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/31/06
Date

jjw/m07-426

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	8D	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
FRC-03-103	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool 4°C

000023

SAMPLE ANALYSIS

Preservation				None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container				G/P	aG	aG	G	aG	aG			
No. of Container(s)				1	1	1	1	1	1			
Volume				250g	120mL	250mL	120mL	250mL	250mL			
				See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time									
J12P53	SOIL	06/29/06	0925	✓	✓	✓	✓	✓	✓			C-12
J12P54	SOIL		0928	✓	✓	✓	✓	✓	✓			C-11
J12P55	SOIL	06/29/06	0935	✓	✓	✓	✓	✓	✓			C-17
~~J12P56~~	~~SOIL~~	06/29/06										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C Martinez C. Martinez	06/29/06 1720	3728 3B	06/29/06 1720
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
3728/3B	7/5/06 1000	M Stankovich 7/5/06	1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
M Stankovich	7/5/06 1600	FED EX	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
FED EX 7-6-06	0930	7-6-06	0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728 Ref #3B on 7/5/06

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 (08/29/2005)

000000031

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	813	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-03-~~103~~ 103 no. 7/5/06	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES/LIONVILLE	A060518	See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1
Volume	250g	120mL	250mL	120mL	250mL	250mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418 I
J12PY9	SOIL	06/29/06	1400	✓	✓	✓	✓	✓	✓

D 2

00024

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A	7/5/06 0930	m Stankovich	7/5/06 0930
m Stankovich	WCH 7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728
Ref # 3A on 7/5/06

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WS=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 (08/29/2005)

00000032

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
C. Martinez	C. Martinez	509-539-2816	KESSNER, JH	80	

Project Designation	Sampling Location	SAF No.	Air Quality
100-BC Burial Grounds - Soil Full Protocol	128-B-3 (Upland/General/Tar)	RC-020	21 days

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC-02-006	EFL 1173-8	R128B32000	FED EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
EBERLINE SERVICES / LIONVILLE	A060517	See OSPC

000000033

POSSIBLE SAMPLE HAZARDS/REMARKS

none

Special Handling and/or Storage

~~None~~ TRE 7-3-06

Cool to 4°c

Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1				
Volume	250g	120mL	250mL	120mL	250mL	250mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Pesticides - 8081	TPH (Total) - 418.1				

000025

Sample No.	Matrix *	Sample Date	Sample Time										
J12PW9	SOIL	06/29/06	0955	✓	✓	✓	✓	✓	✓				C-1
J12PX0	SOIL		0958	✓	✓	✓	✓	✓	✓				2
J12PX1	SOIL		1002	✓	✓	✓	✓	✓	✓				3
J12PX2	SOIL		1005	✓	✓	✓	✓	✓	✓				6
J12PX3	SOIL	06/29/06	1012	✓	✓	✓	✓	✓	✓				5

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. Martinez / C. Martinez	1720 06/29/06	3728 3A	1720 06/29/06
3728/3A	7/5/06 0900	MStankovich	7/5/06 0900
WCH MStankovich	7/5/06 1500	Fed Ex	
Fed Ex	7-6-06 0930	[signature]	7-6-06 0930

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)

Personnel not available to relinquish samples from 3728

Ref # 3A on 7/5/06

Matrix *

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

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

BHI-EE-011 (08/29/2005)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	128-B-3		DATA PACKAGE:	K0465	
VALIDATOR:		LAB: LLI		DATE: 9/10/06	
			SDG: K0465		

ANALYSES PERFORMED

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

SAMPLES/MATRIX

J12P53	J12P54	J12P55	J12PY9	J12PW9
J12PX0	J12PX1	J12PX2	J12PX3	

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: no FB

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

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

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

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

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

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

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

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

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

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

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

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

Comments: MS - antimony 49% - J all no BTS
LCS - Silicon 53.8% - J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments:

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments: all selenium over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/25/06

LIENT: TNUHANFORD RC-020 K0465

LVL LOT #: 06071426

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

AMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
LANK1	06L0437-MB1	Silver, Total	0.07	u	MG/KG	0.07	1.0
		Aluminum, Total	2.9	u	MG/KG	2.9	1.0
		Arsenic, Total	0.61	u	MG/KG	0.61	1.0
		Boron, Total	0.26		MG/KG	0.24	1.0
		Barium, Total	0.02	u	MG/KG	0.02	1.0
		Beryllium, Total	0.02	u	MG/KG	0.02	1.0
		Calcium, Total	2.4		MG/KG	1.6	1.0
		Cadmium, Total	0.07	u	MG/KG	0.07	1.0
		Cobalt, Total	0.14	u	MG/KG	0.14	1.0
		Chromium, Total	0.13	u	MG/KG	0.13	1.0
		Copper, Total	0.12	u	MG/KG	0.12	1.0
		Iron, Total	3.5	u	MG/KG	3.5	1.0
		Potassium, Total	2.3	u	MG/KG	2.3	1.0
		Magnesium, Total	0.97	u	MG/KG	0.97	1.0
		Manganese, Total	0.03	u	MG/KG	0.03	1.0
		Molybdenum, Total	0.29	u	MG/KG	0.29	1.0
		Sodium, Total	0.76	u	MG/KG	0.76	1.0
		Nickel, Total	0.24	u	MG/KG	0.24	1.0
		Lead, Total	0.31	u	MG/KG	0.31	1.0
		Antimony, Total	0.44	u	MG/KG	0.44	1.0
		Selenium, Total	0.47	u	MG/KG	0.47	1.0
		Silicon, Total	2.3	u	MG/KG	2.3	1.0
		Vanadium, Total	0.09	u	MG/KG	0.09	1.0
		Zinc, Total	0.16	u	MG/KG	0.16	1.0
LANK1	06C0136-MB1	Mercury, Total	0.02	u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/25/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

AMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
301	J12P63	Silver, Total	4.3	0.20u	4.9	87.8	3.0
		Aluminum, Total	9230	5930	195	1181 *	3.0
		Arsenic, Total	183	2.2	195	92.6	3.0
		Boron, Total	90.4	3.3	97.6	89.2	3.0
		Barium, Total	279	89.7	195	96.8	3.0
		Beryllium, Total	5.0	0.35	4.9	94.9	3.0
		Calcium, Total	5800	3240	2440	105.0	3.0
		Cadmium, Total	4.6	0.20u	4.9	93.9	3.0
		Cobalt, Total	54.5	7.4	48.8	96.5	3.0
		Chromium, Total	31.9	11.5	19.5	104.6	3.0
		Copper, Total	37.8	13.5	24.4	99.6	3.0
		Iron, Total	20100	16900	97.6	3285 *	3.0
		Potassium, Total	4060	1570	2440	101.9	3.0
		Magnesium, Total	6540	3820	2440	111.3	3.0
		Manganese, Total	429	365	48.8	132.3*	3.0
		Molybdenum, Total	90.3	0.85u	97.6	92.5	3.0
		Sodium, Total	2440	110	2440	95.5	3.0
		Nickel, Total	59.3	11.2	48.8	98.6	3.0
		Lead, Total	51.0	5.0	48.8	94.3	3.0
		Antimony, Total	24.3	1.3 u	48.8	49.8	3.0
		Selenium, Total	180	1.4 u	195	92.2	3.0
		Silicon, Total	851	570	97.6	287.3*	3.0
		Vanadium, Total	86.9	34.6	48.8	107.2	3.0
		Zinc, Total	88.1	37.5	48.8	103.7	3.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 07/25/06

.IENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
03	J12P55	Mercury, Total	0.26	0.08	0.16	109.3	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/25/06

.IENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
01REP	J12PS3	Silver, Total	0.20u	0.20u	NC	3.0
		Aluminum, Total	6930	7450	7.3	3.0
		Arsenic, Total	2.2	2.5	12.8	3.0
		Boron, Total	3.3	3.0	9.5	3.0
		Barium, Total	89.7	97.6	8.4	3.0
		Beryllium, Total	0.35	0.39	10.3	3.0
		Calcium, Total	3240	3610	10.9	3.0
		Cadmium, Total	0.20u	0.20u	NC	3.0
		Cobalt, Total	7.4	8.2	10.3	3.0
		Chromium, Total	11.5	12.0	4.3	3.0
		Copper, Total	13.5	14.2	5.1	3.0
		Iron, Total	16900	20200	17.8	3.0
		Potassium, Total	1570	1660	5.6	3.0
		Magnesium, Total	3820	4090	6.8	3.0
		Manganese, Total	365	404	10.2	3.0
		Molybdenum, Total	0.85u	0.85u	NC	3.0
		Sodium, Total	110	119	7.6	3.0
		Nickel, Total	11.2	12.2	8.5	3.0
		Lead, Total	5.0	5.1	2.0	3.0
		Antimony, Total	1.3 u	1.3 u	NC	3.0
		Selenium, Total	1.4 u	1.4 u	NC	3.0
		Silicon, Total	570	548	4.0	3.0
		Vanadium, Total	34.6	40.0	14.5	3.0
		Zinc, Total	37.5	42.0	11.3	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 07/25/06

IENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

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

MPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
03REP	J12P55	Mercury, Total	0.08	0.09	7.1	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/26/06

LIENT: TNUHANFORD RC-020 K0465 LVL LOT #: 0607L426

ORK ORDER: 11243-606-001-9999-00

AMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
CS1	06L0437-LC1	Silver, LCS	48.5	50.0	MG/KG	97.0
		Aluminum, LCS	484	500	MG/KG	96.8
		Arsenic, LCS	928	1000	MG/KG	92.8
		Boron, LCS	470	500	MG/KG	93.9
		Barium, LCS	484	500	MG/KG	96.8
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Calcium, LCS	2500	2500	MG/KG	100.0
		Cadmium, LCS	24.3	25.0	MG/KG	97.2
		Cobalt, LCS	244	250	MG/KG	97.7
		Chromium, LCS	50.1	50.0	MG/KG	100.2
		Copper, LCS	122	125	MG/KG	97.6
		Iron, LCS	494	500	MG/KG	98.9
		Potassium, LCS	2330	2500	MG/KG	93.2
		Magnesium, LCS	2390	2500	MG/KG	95.6
		Manganese, LCS	75.5	75.0	MG/KG	100.7
		Molybdenum, LCS	494	500	MG/KG	98.7
		Sodium, LCS	2310	2500	MG/KG	92.4
		Nickel, LCS	196	200	MG/KG	98.0
		Lead, LCS	243	250	MG/KG	97.2
		Antimony, LCS	288	300	MG/KG	96.1
		Selenium, LCS	871	1000	MG/KG	87.1
		Silicon, LCS	269	500	MG/KG	53.8
		Vanadium, LCS	247	250	MG/KG	98.8
		Zinc, LCS	95.5	100	MG/KG	95.5
CS1	06C0136-LC1	Mercury, LCS	6.3	6.2	MG/KG	101.5