0094858

SAF-RC-142
100-IU-2 & 100-IU-6 Remaining Sites
Soil Full Protocol
FINAL VALIDATION DATA PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt H4-21 KW 3/8/11
INITIAL/DATE

COMMENTS:

SDG K2419 **SAF-RC-142**

Waste Site: 600-205

RECEIVED
MAR 15 2011
EDMC

Date: 7 March 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Sites – Soil Full Protocol - Waste Site 600-205
Subject: Polyaromatic Hydrocarbons - Data Package No. K2419-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2419 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	Analyte
J1C3H3	9/27/10	Soil	C	See note 1
J1C3H4	9/27/10	Soil	C	See note 1
J1C3H5	9/27/10	Soil	C	See note 1
J1C3H6	9/27/10	Soil	C	See note 1
J1C3H7	9/27/10	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY 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 acceptable.

- **Method Blanks**

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

All method blank results were acceptable.

Field (equipment) 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.

All laboratory results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1C3H3/J1C3H7) was submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

Completeness

Data package No. K2419 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

DOE/RL-96-22, Rev. 5, *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

POLYAROMATIC HYDROCARBON DATA QUALIFICATION SUMMARY*

SDG: K2419	REVIEWER: ELR	Project: 600-205	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

Annotated Laboratory Reports

LIONVILLE LABORATORY
A division of Fibertine Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

J1C3H3
1009156-01 (Soil)

3/9/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310								
Naphthalene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthylene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthene	**59.1**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluorene	**1.20 J**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Phenanthrene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Anthracene	**8.93**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluoranthene	**12.7**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Indeno[1,2,3-cd]pyrene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Pyrene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benz[a]anthracene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Chrysene	**0.927 J**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[b] fluoranthene	**8.96**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[k] fluoranthene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[a] pyrene	**1.72 J**	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Dibenz[a,h]anthracene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[g,h,i] perylene	3.43 U	3.43	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Surrogate: Triphenylene	*113 %*	*68-129*			*L009428*	*09/30/2010*	*11/01/2010*	*8310*

LIONVILLE LABORATORY
A division of Pontine Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

J1C3H4
1009156-02 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310								
Naphthalene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Acenaphthylene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Acenaphthene	0.887 J	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Fluorene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Phenanthrene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Anthracene	2.31 J	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Fluoranthene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Indeno[1,2,3-cd]pyrene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Pyrene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Benz[a]anthracene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Chrysene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Benzo[b] fluoranthene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Benzo[k] fluoranthene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Benzo[a] pyrene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Dibenz[a,h]anthracene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Benzo[g,h,i] perylene	3.54 U	3.54	ug/kg dry	1	L009428	09/30/2010	10/29/2010	8310
Surrogate: Triphenylene	*101 %*	*68-129*			*L009428*	*09/30/2010*	*10/29/2010*	*8310*

LIONVILLE LABORATORY
A division of Iberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

J1C3H5
1009156-03 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310								
Naphthalene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthylene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluorene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Phenanthrene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Anthracene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluoranthene	**146**	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Indeno[1,2,3-cd]pyrene	**4.57**	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Pyrene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benz[a]anthracene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Chrysene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[b] fluoranthene	**3.61**	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[k] fluoranthene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[a] pyrene	**1.45 J**	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Dibenz[a,h]anthracene	3.42 U	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[g,h,i] perylene	**2.84 J**	3.42	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Surrogate: Triphenylene	*108 %*	*68-129*			*L009428*	*09/30/2010*	*11/01/2010*	*8310*

LIONVILLE LABORATORY
A division of Fibertine Analytical Corporation

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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

J1C3H6
1009156-04 (Soil)

3/5/4

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310								
Naphthalene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthylene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthene	**3.40**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluorene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Phenanthrene	**1.36 J**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Anthracene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluoranthene	**34.5**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Indeno[1,2,3-cd]pyrene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Pyrene	**4.94**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benz[a]anthracene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Chrysene	**6.08**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[b] fluoranthene	**1.94 J**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[k] fluoranthene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[a] pyrene	**1.27 J**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Dibenz[a,h]anthracene	3.39 U	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[g,h,i] perylene	**0.883 J**	3.39	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Surrogate: Triphenylene	*101 %*	*68-129*			*L009428*	*09/30/2010*	*11/01/2010*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

J1C3H7
1009156-05 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310								
Naphthalene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthylene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Acenaphthene	**48.1**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluorene	**5.17**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Phenanthrene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Anthracene	**9.31**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Fluoranthene	**8.97**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Indeno[1,2,3-cd]pyrene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Pyrene	**1.09 J**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benz[a]anthracene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Chrysene	**2.03 J**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[b] fluoranthene	**13.7**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[k] fluoranthene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[a] pyrene	**4.45**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Dibenz[a,h]anthracene	3.44 U	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Benzo[g,h,i] perylene	**1.43 J**	3.44	ug/kg dry	1	L009428	09/30/2010	11/01/2010	8310
Surrogate: Triphenylene	*107 %*	*68-129*			*L009428*	*09/30/2010*	*11/01/2010*	*8310*

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-142 K2419
LVL #: 1009156

W.O. #: 60049-001-001-0001-00
Date Received: 09-29-2010

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

Five (5) soil samples were collected on 09-27-2010.

The samples and associated QC samples were extracted 09-30-2010 and analyzed 10-05,29-2010 and 11-01-2010 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The sample was 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 data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

11/2/10
Date

r:\group\data\2010\pah 8310\wc-hanford\1009156jes.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 pages.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-142-021	Page 1 of 2

Collector T. Welch-Koelling/R. Berven	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Sites - Soil Full Protocol	Sampling Location 600-205 (Verification)		SAF No. RC-142
Ice Chest No. WCH-08-034	Field Logbook No. EL-1643-2	COA R602052000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A100549		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	250mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	Pesticides - 8081							
Sample No. / Matrix * / Sample Date / Sample Time											
J1C3H3 / SOIL / 9-27-10 / 0715	X	X	X	X							
J1C3H4 / SOIL /	X	X	X	X							
J1C3H5 / SOIL /	X	X	X	X							
J1C3H6 / SOIL /	X	X	X	X							
J1C3H7 / SOIL / 9-27-10 / 0715	X	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Berven	9-27-10 1430	C. Martinez/C. Martinez	09/27/10 1430
C. Martinez/C. Martinez	09/27/10 1610	J. E. Bernal	9-27-10 1610
J. E. Bernal / WCH	9-28-10 1000	FED EX	
FED EX	9-29-10 1000	VICTOR HERNANDEZ	9-29-10 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out 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 - 7471~~ (CV) 09/27/10

REVIEWED BY JDI DATE 9/28/10

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

WCH-EE-011

000017

000000013

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Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-205			DATA PACKAGE: K2419		
VALIDATOR: ELR		LAB: LLI		DATE: 3/5/11	
			SDG: K2419		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J1C3H3	J1C3H4	J1C3H5	J1C3H6	J1C3H7	
					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)

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:

GENERAL 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: 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 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 ORGANIC 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 ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L009428 - SW 3540C									
Blank (L009428-BLK1)			Prepared: 09/30/2010 Analyzed: 10/05/2010						
Naphthalene	3.33 U	3.33	ug/kg wet						
Acenaphthylene	3.33 U	3.33	ug/kg wet						
Acenaphthene	3.33 U	3.33	ug/kg wet						
Fluorene	3.33 U	3.33	ug/kg wet						
Phenanthrene	3.33 U	3.33	ug/kg wet						
Anthracene	3.33 U	3.33	ug/kg wet						
Fluoranthene	3.33 U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33 U	3.33	ug/kg wet						
Pyrene	3.33 U	3.33	ug/kg wet						
Benz[a]anthracene	3.33 U	3.33	ug/kg wet						
Chrysene	3.33 U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33 U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33 U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33 U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33 U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33 U	3.33	ug/kg wet						
Surrogate: Triphenylene	*154*		*ug/kg wet*	*166.67*		*93*	*68-129*		
LCS (L009428-BS1)			Prepared: 09/30/2010 Analyzed: 10/05/2010						
Naphthalene	157	3.33	ug/kg wet	166.67		94	0-127		
Acenaphthylene	183	3.33	ug/kg wet	166.67		110	50-140		
Acenaphthene	140	3.33	ug/kg wet	166.67		84	17-139		
Fluorene	168	3.33	ug/kg wet	166.67		101	28-145		
Phenanthrene	158	3.33	ug/kg wet	166.67		95	30-152		
Anthracene	165	3.33	ug/kg wet	166.67		99	19-171		
Fluoranthene	157	3.33	ug/kg wet	166.67		94	34-159		
Indeno[1,2,3-cd]pyrene	166	3.33	ug/kg wet	166.67		99	31-156		
Pyrene	183	3.33	ug/kg wet	166.67		110	33-152		
Benz[a]anthracene	143	3.33	ug/kg wet	166.67		86	32-157		
Chrysene	192	3.33	ug/kg wet	166.67		115	31-159		
Benzo[b] fluoranthene	167	3.33	ug/kg wet	166.67		100	33-164		
Benzo[k] fluoranthene	172	3.33	ug/kg wet	166.67		103	28-161		
Benzo[a] pyrene	146	3.33	ug/kg wet	166.67		88	29-149		
Dibenz[a,h]anthracene	171	3.33	ug/kg wet	166.67		103	27-153		
Benzo[g,h,i] perylene	174	3.33	ug/kg wet	166.67		104	32-157		
Surrogate: Triphenylene	*158*		*ug/kg wet*	*166.67*		*95*	*68-129*		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 11/01/2010 20:23

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L009428 - SW 3540C									
Matrix Spike (L009428-MS2)		**Source: 1009156-01**		**Prepared: 09/30/2010 Analyzed: 11/01/2010**					
Naphthalene	159	3.35	ug/kg dry	167.70	3.43 U	95	0-127		
Acenaphthylene	126	3.35	ug/kg dry	167.70	3.43 U	75	50-140		
Acenaphthene	229	3.35	ug/kg dry	167.70	59.1	102	17-139		
Fluorene	155	3.35	ug/kg dry	167.70	1.20	92	28-145		
Phenanthrene	149	3.35	ug/kg dry	167.70	3.43 U	89	30-152		
Anthracene	155	3.35	ug/kg dry	167.70	8.93	87	19-171		
Fluoranthene	161	3.35	ug/kg dry	167.70	12.7	88	34-159		
Indeno[1,2,3-cd]pyrene	150	3.35	ug/kg dry	167.70	3.43 U	89	31-156		
Pyrene	155	3.35	ug/kg dry	167.70	3.43 U	93	33-152		
Benz[a]anthracene	118	3.35	ug/kg dry	167.70	3.43 U	71	32-157		
Chrysene	164	3.35	ug/kg dry	167.70	0.927	97	31-159		
Benzo[b] fluoranthene	171	3.35	ug/kg dry	167.70	8.96	97	33-164		
Benzo[k] fluoranthene	163	3.35	ug/kg dry	167.70	3.43 U	97	28-161		
Benzo[a] pyrene	148	3.35	ug/kg dry	167.70	1.72	87	29-149		
Dibenz[a,h]anthracene	159	3.35	ug/kg dry	167.70	3.43 U	95	27-153		
Benzo[g,h,i] perylene	160	3.35	ug/kg dry	167.70	3.43 U	96	32-157		
Surrogate: Triphenylene	*177*		*ug/kg dry*	*167.70*		*106*	*68-129*		
Matrix Spike Dup (L009428-MSD2)		**Source: 1009156-01**		**Prepared: 09/30/2010 Analyzed: 11/01/2010**					
Naphthalene	205	3.43	ug/kg dry	171.71	3.43 U	120	0-127	23	40
Acenaphthylene	161	3.43	ug/kg dry	171.71	3.43 U	94	50-140	22	40
Acenaphthene	293	3.43	ug/kg dry	171.71	59.1	136	17-139	29	40
Fluorene	185	3.43	ug/kg dry	171.71	1.20	107	28-145	15	40
Phenanthrene	188	3.43	ug/kg dry	171.71	3.43 U	109	30-152	20	40
Anthracene	192	3.43	ug/kg dry	171.71	8.93	107	19-171	21	40
Fluoranthene	212	3.43	ug/kg dry	171.71	12.7	116	34-159	27	40
Indeno[1,2,3-cd]pyrene	184	3.43	ug/kg dry	171.71	3.43 U	107	31-156	18	40
Pyrene	192	3.43	ug/kg dry	171.71	3.43 U	112	33-152	19	40
Benz[a]anthracene	144	3.43	ug/kg dry	171.71	3.43 U	84	32-157	17	40
Chrysene	173	3.43	ug/kg dry	171.71	0.927	100	31-159	3	40
Benzo[b] fluoranthene	195	3.43	ug/kg dry	171.71	8.96	108	33-164	11	40
Benzo[k] fluoranthene	198	3.43	ug/kg dry	171.71	3.43 U	115	28-161	17	40
Benzo[a] pyrene	182	3.43	ug/kg dry	171.71	1.72	105	29-149	19	40
Dibenz[a,h]anthracene	193	3.43	ug/kg dry	171.71	3.43 U	113	27-153	17	40
Benzo[g,h,i] perylene	196	3.43	ug/kg dry	171.71	3.43 U	114	32-157	18	40
Surrogate: Triphenylene	*202*		*ug/kg dry*	*171.71*		*118*	*68-129*		

Date: 7 March 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Sites – Soil Full Protocol - Waste Site 600-205
Subject: Pesticides - Data Package No. K2419-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2419 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	Analyte
J1C3H3	9/27/10	Soil	C	See note 1
J1C3H4	9/27/10	Soil	C	See note 1
J1C3H5	9/27/10	Soil	C	See note 1
J1C3H6	9/27/10	Soil	C	See note 1
J1C3H7	9/27/10	Soil	C	See note 1

1 – Pesticides by 8081A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY 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: Pesticide 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 acceptable.

Method Blanks

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

All method blank results were acceptable.

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.

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

Due to a matrix spike and matrix spike duplicate recoveries outside QC limits, all alpha-BHC (43% & 39%) results were qualified as estimates and flagged "J".

All other 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 the lack of a matrix spike and matrix spike duplicate analysis, all toxaphene results were qualified as estimates and flagged "J".

All other laboratory results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1C3H3/J1C3H7) was submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K2419 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 and LCS analysis, all toxaphene results were qualified as estimates and flagged "J".

- Due to a matrix spike and matrix spike duplicate recoveries outside QC limits, all alpha-BHC (43% & 39%) 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.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

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

PESTICIDES DATA QUALIFICATION SUMMARY*

SDG: K2419	REVIEWER: ELR	Project: 600-205	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No MS, MSD or LCS analysis
Alpha-BHC	J	All	MS & MSD 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

Annotated Laboratory Reports

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

J1C3H3
1009156-01 (Soil)

V 3/3/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Organochlorine Pesticides by SW846 8081A								
alpha-BHC	70.9 D J	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
gamma-BHC	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
beta-BHC	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
delta-BHC	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Heptachlor	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Aldrin	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Heptachlor epoxide	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
gamma-Chlordane	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
alpha-Chlordane	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan I	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDE	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Dieldrin	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDD	86.2 D	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan II	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDT	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin aldehyde	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan sulfate	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Methoxychlor	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin ketone	2.66 U	2.66	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Toxaphene	26.6 U J	26.6	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Surrogate: Tetrachloro-meta-xylene	*95.8 %*	*28-166*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*
Surrogate: Decachlorobiphenyl	*98.6 %*	*37-153*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

J1C3H4
1009156-02 (Soil)

✓ 3/5/11

Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Organochlorine Pesticides by SW846 8081A								
alpha-BHC	1.43 U J	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-BHC	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
beta-BHC	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
delta-BHC	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Aldrin	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor epoxide	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-Chlordane	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
alpha-Chlordane	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan I	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDE	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Dieldrin	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDD	3.33 J, D	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan II	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDT	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin aldehyde	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan sulfate	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Methoxychlor	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin ketone	1.43 U	1.43	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Toxaphene	14.3 U J	14.3	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Surrogate: Tetrachloro-meta-xylene	*129 %*	*28-166*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*
Surrogate: Decachlorobiphenyl	*118 %*	*37-153*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

J1C3H5
1009156-03 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Organochlorine Pesticides by SW846 8081A								
alpha-BHC	**10.2 D** J	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-BHC	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
beta-BHC	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
delta-BHC	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Aldrin	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor epoxide	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-Chlordane	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
alpha-Chlordane	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan I	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDE	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Dieldrin	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDD	**28.2 D**	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan II	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDT	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin aldehyde	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan sulfate	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Methoxychlor	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin ketone	1.34 U	1.34	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Toxaphene	13.4 U J	13.4	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Surrogate: Tetrachloro-meta-xylene	*104 %*	*28-166*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*
Surrogate: Decachlorobiphenyl	*106 %*	*37-153*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

J1C3H6
1009156-04 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Organochlorine Pesticides by SW846 8081A								
alpha-BHC	8.64 D J	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-BHC	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
beta-BHC	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
delta-BHC	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Aldrin	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Heptachlor epoxide	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
gamma-Chlordane	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
alpha-Chlordane	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan I	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDE	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Dieldrin	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDD	21.2 D	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan II	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDT	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin aldehyde	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endosulfan sulfate	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Methoxychlor	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Endrin ketone	1.32 U	1.32	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Toxaphene	13.2 U J	13.2	ug/kg dry	4	L010101	10/07/2010	10/15/2010	8081A
Surrogate: Tetrachloro-meta-xylene	*111 %*	*28-166*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*
Surrogate: Decachlorobiphenyl	*106 %*	*37-153*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

J1C3H7
1009156-05 (Soil)

3/5/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Organochlorine Pesticides by SW846 8081A								
alpha-BHC	223 D J	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
gamma-BHC	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
beta-BHC	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
delta-BHC	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Heptachlor	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Aldrin	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Heptachlor epoxide	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
gamma-Chlordane	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
alpha-Chlordane	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan I	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDE	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Dieldrin	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDD	453 D	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan II	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
4,4'-DDT	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin aldehyde	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endosulfan sulfate	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Methoxychlor	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Endrin ketone	2.72 U	2.72	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Toxaphene	27.2 U J	27.2	ug/kg dry	8	L010101	10/07/2010	10/15/2010	8081A
Surrogate: Tetrachloro-meta-xylene	*148 %*	*28-166*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*
Surrogate: Decachlorobiphenyl	*132 %*	*37-153*			*L010101*	*10/07/2010*	*10/15/2010*	*8081A*

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-142 K2419
LVL #: 1009156

W.O. #: 60049-001-001-0001-00
Date Received: 09-29-2010

CHLORINATED PESTICIDES

Five (5) soil samples were collected on 09-27-2010.

The samples and associated QC samples were extracted 10-07-2010 and analyzed 10-12,15-2010 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8081A for client specified target compounds. All samples received Copper-Sulfur cleanup based on SW846 method 3660A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample(s) that met LvL's sample acceptance policy.

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

3. The samples J1C3H4, J1C3H5 and J1C3H6 required a 4-fold instrument dilution due to the nature of the matrix. Samples J1C3H3 and J1C3H7 required a 8-fold instrument dilution due to the nature of the matrix. Samples L010101-MS1 and L010101-MSD1 required a 8-fold instrument dilution due to high concentrations of non-target analytes, Halowax, present. Reporting limits have been adjusted to reflect the necessary dilutions.

4. All obtainable surrogate recoveries were within acceptance criteria.

5. The method blank was below the reporting limit for all target compounds.

6. All blank spike recoveries were within acceptance criteria.

7. Ten (10) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR # 10GC327) has been enclosed.

8. The samples are reported on a dry weight basis.

9. All 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 19 pages.

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

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 hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

for Iain Daniels
LvL Laboratory Manager

10/25/10
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 10GC327

Initiator: Catherine Carey
Date: 10/23/10
Client: LOC Hanford

Batch: 1009156
Samples: L010101-MS1/MSD1
Method: SW846/MCAWW/CLP/

Parameter: Pest
Matrix: Soil
Prep Batch: L010101

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)

several spike recoveries are outside QC limits

BS okay

2. Known or Probable Causes(s)

Interference from "Halowax" contamination

3. Discussion and Proposed Action Other Description:

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

Narrate

ID

4. Project Manager Instructions...signature/date: 10/25/10

__ 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: 10-25-10 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 for diposition.

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-142-021	Page 1 of 2

Collector T. Welch-Koelling/R. Berven	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Sites - Soil Full Protocol	Sampling Location 600-205 (Verification)		SAF No. RC-142
Ice Chest No. WCH-08-034	Field Logbook No. EL-1643-2	COA R602052000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A100549		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	250mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	Pesticides - 8081							
Sample No. / Matrix * / Sample Date / Sample Time											
J1C3H3 / SOIL / 9-27-10 / 0715	X	X	X	X							
J1C3H4 / SOIL /	X	X	X	X							
J1C3H5 / SOIL /	X	X	X	X							
J1C3H6 / SOIL /	X	X	X	X							
J1C3H7 / SOIL / 9-27-10 / 0715	X	X	X	X							

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From R. Berven	Date/Time 9-27-10 1430	Received By/Stored In C. Martinez/C. Martinez 09/27/10
Relinquished By/Removed From C. Martinez/C. Martinez 09/27/10	Date/Time 1610	Received By/Stored In J. E. Bennel 9-27-10
Relinquished By/Removed From J. E. Bennel welt	Date/Time 1000 9-28-10	Received By/Stored In FED EX
Relinquished By/Removed From FED EX	Date/Time 9-29-10 1000	Received By/Stored In VICTOR HERNANDEZ 9-29-10 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In
Relinquished By/Removed From	Date/Time	Received By/Stored In

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out 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 - 7471~~ (CV) 09/27/10

REVIEWED BY JRD DATE 9/28/10

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

WCH-EE-011

000019

9999999817

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	G00-205		DATA PACKAGE:	K2419	
VALIDATOR:	ELR	LAB: LLI		DATE: 3/5/11	
			SDG:	K2419	

ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		

SAMPLES/MATRIX				
J1C3H3	J1C3H4	J1C3H5	J1C3H6	J1C3H7
				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: MS - alpha BHC - 43% - J all no PAS

MSD - alpha BHC (39%) - J all

tox - no 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:

no tox MS/MSD - J all

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:

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:

Appendix 6

Additional Documentation Requested by Client

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010101 - SW 3540C									
Blank (L010101-BLK1)			Prepared: 10/07/2010 Analyzed: 10/12/2010						
alpha-BHC	0.333 U	0.333	ug/kg wet						
gamma-BHC	0.333 U	0.333	ug/kg wet						
beta-BHC	0.333 U	0.333	ug/kg wet						
delta-BHC	0.333 U	0.333	ug/kg wet						
Heptachlor	0.333 U	0.333	ug/kg wet						
Aldrin	0.333 U	0.333	ug/kg wet						
Heptachlor epoxide	0.333 U	0.333	ug/kg wet						
gamma-Chlordane	0.333 U	0.333	ug/kg wet						
alpha-Chlordane	0.333 U	0.333	ug/kg wet						
Endosulfan I	0.333 U	0.333	ug/kg wet						
4,4'-DDE	0.333 U	0.333	ug/kg wet						
Dieldrin	0.333 U	0.333	ug/kg wet						
Endrin	0.333 U	0.333	ug/kg wet						
4,4'-DDD	0.333 U	0.333	ug/kg wet						
Endosulfan II	0.333 U	0.333	ug/kg wet						
4,4'-DDT	0.333 U	0.333	ug/kg wet						
Endrin aldehyde	0.333 U	0.333	ug/kg wet						
Endosulfan sulfate	0.333 U	0.333	ug/kg wet						
Methoxychlor	0.333 U	0.333	ug/kg wet						
Endrin ketone	0.333 U	0.333	ug/kg wet						
Toxaphene	5.00 U	5.00	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*32.3*		*ug/kg wet*	*33.337*		*97.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*32.4*		*ug/kg wet*	*33.333*		*97.2*	*37-153*		
LCS (L010101-BS1)			Prepared: 10/07/2010 Analyzed: 10/12/2010						
alpha-BHC	37.3	0.333	ug/kg wet	33.333		112	61-142		
gamma-BHC	36.7	0.333	ug/kg wet	33.333		110	65-142		
beta-BHC	36.7	0.333	ug/kg wet	33.333		110	71-134		
delta-BHC	35.0	0.333	ug/kg wet	33.333		105	53-144		
Heptachlor	36.7	0.333	ug/kg wet	33.333		110	70-138		
Aldrin	36.5	0.333	ug/kg wet	33.333		110	70-143		
Heptachlor epoxide	35.0	0.333	ug/kg wet	33.333		105	72-140		
gamma-Chlordane	34.7	0.333	ug/kg wet	33.333		104	74-140		
alpha-Chlordane	34.7	0.333	ug/kg wet	33.333		104	74-138		
Endosulfan I	35.0	0.333	ug/kg wet	33.333		105	81-141		
4,4'-DDE	37.7	0.333	ug/kg wet	33.333		113	82-145		
Dieldrin	36.0	0.333	ug/kg wet	33.333		108	79-144		

LVL
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010101 - SW 3540C									
LCS (L010101-BS1)			Prepared: 10/07/2010 Analyzed: 10/12/2010						
Endrin	39.3	0.333	ug/kg wet	33.333		118	73-147		
4,4'-DDD	36.7	0.333	ug/kg wet	33.333		110	77-148		
Endosulfan II	36.0	0.333	ug/kg wet	33.333		108	80-140		
4,4'-DDT	38.3	0.333	ug/kg wet	33.333		115	82-142		
Endrin aldehyde	31.3	0.333	ug/kg wet	33.333		94.0	59-133		
Endosulfan sulfate	34.3	0.333	ug/kg wet	33.333		103	77-135		
Methoxychlor	39.7	0.333	ug/kg wet	33.333		119	77-136		
Endrin ketone	35.3	0.333	ug/kg wet	33.333		106	85-134		
Surrogate: Tetrachloro-meta-xylene	*36.6*		*ug/kg wet*	*33.337*		*110*	*28-166*		
Surrogate: Decachlorobiphenyl	*33.7*		*ug/kg wet*	*33.333*		*101*	*37-153*		
Matrix Spike (L010101-MS1)		Source: 1009156-01	Prepared: 10/07/2010 Analyzed: 10/15/2010						
alpha-BHC	85.8 D	2.72	ug/kg dry	34.320	70.9	43.2*	61-142		
gamma-BHC	32.8 D	2.72	ug/kg dry	34.320	2.66 U	95.7	65-142		
beta-BHC	77.4 D	2.72	ug/kg dry	34.320	2.66 U	226*	71-134		
delta-BHC	37.6 D	2.72	ug/kg dry	34.320	2.66 U	110	53-144		
Heptachlor	93.6 D	2.72	ug/kg dry	34.320	2.66 U	273*	70-138		
Aldrin	39.0 D	2.72	ug/kg dry	34.320	2.66 U	114	70-143		
Heptachlor epoxide	40.0 D	2.72	ug/kg dry	34.320	2.66 U	116	72-140		
gamma-Chlordane	43.0 D	2.72	ug/kg dry	34.320	2.66 U	125	74-140		
alpha-Chlordane	40.4 D	2.72	ug/kg dry	34.320	2.66 U	118	74-138		
Endosulfan I	41.4 D	2.72	ug/kg dry	34.320	2.66 U	121	81-141		
4,4'-DDE	199 D	2.72	ug/kg dry	34.320	2.66 U	579*	82-145		
Dieldrin	39.1 D	2.72	ug/kg dry	34.320	2.66 U	114	79-144		
Endrin	39.0 D	2.72	ug/kg dry	34.320	2.66 U	114	73-147		
4,4'-DDD	110 D	2.72	ug/kg dry	34.320	86.2	70.6*	77-148		
Endosulfan II	39.9 D	2.72	ug/kg dry	34.320	2.66 U	116	80-140		
4,4'-DDT	42.9 D	2.72	ug/kg dry	34.320	2.66 U	125	82-142		
Endrin aldehyde	50.1 D	2.72	ug/kg dry	34.320	2.66 U	146*	59-133		
Endosulfan sulfate	39.8 D	2.72	ug/kg dry	34.320	2.66 U	116	77-135		
Methoxychlor	43.6 D	2.72	ug/kg dry	34.320	2.66 U	127	77-136		
Endrin ketone	41.9 D	2.72	ug/kg dry	34.320	2.66 U	122	85-134		
Surrogate: Tetrachloro-meta-xylene	*43.0*		*ug/kg dry*	*34.323*		*125*	*28-166*		
Surrogate: Decachlorobiphenyl	*40.2*		*ug/kg dry*	*34.320*		*117*	*37-153*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/23/2010 07:16

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010101 - SW 3540C									
Matrix Spike Dup (L010101-MSD1)		**Source: 1009156-01**		**Prepared: 10/07/2010 Analyzed: 10/15/2010**					
alpha-BHC	84.2 D	2.67	ug/kg dry	33.737	70.9	39.4*	61-142	9.37	40
gamma-BHC	28.7 D	2.67	ug/kg dry	33.737	2.66 U	85.0	65-142	11.8	40
beta-BHC	77.3 D	2.67	ug/kg dry	33.737	2.66 U	229*	71-134	1.54	40
delta-BHC	35.1 D	2.67	ug/kg dry	33.737	2.66 U	104	53-144	5.24	40
Heptachlor	99.5 D	2.67	ug/kg dry	33.737	2.66 U	295*	70-138	7.89	40
Aldrin	35.4 D	2.67	ug/kg dry	33.737	2.66 U	105	70-143	7.97	40
Heptachlor epoxide	36.9 D	2.67	ug/kg dry	33.737	2.66 U	109	72-140	6.29	40
gamma-Chlordane	39.6 D	2.67	ug/kg dry	33.737	2.66 U	118	74-140	6.50	40
alpha-Chlordane	36.9 D	2.67	ug/kg dry	33.737	2.66 U	109	74-138	7.40	40
Endosulfan I	34.2 D	2.67	ug/kg dry	33.737	2.66 U	102	81-141	17.3	40
4,4'-DDE	212 D	2.67	ug/kg dry	33.737	2.66 U	629*	82-145	8.31	40
Dieldrin	35.9 D	2.67	ug/kg dry	33.737	2.66 U	106	79-144	6.99	40
Endrin	36.4 D	2.67	ug/kg dry	33.737	2.66 U	108	73-147	5.14	40
4,4'-DDD	112 D	2.67	ug/kg dry	33.737	86.2	77.4	77-148	9.28	40
Endosulfan II	36.9 D	2.67	ug/kg dry	33.737	2.66 U	109	80-140	6.03	40
4,4'-DDT	39.9 D	2.67	ug/kg dry	33.737	2.66 U	118	82-142	5.42	40
Endrin aldehyde	40.5 D	2.67	ug/kg dry	33.737	2.66 U	120	59-133	19.6	40
Endosulfan sulfate	36.8 D	2.67	ug/kg dry	33.737	2.66 U	109	77-135	6.04	40
Methoxychlor	40.1 D	2.67	ug/kg dry	33.737	2.66 U	119	77-136	6.50	40
Endrin ketone	36.8 D	2.67	ug/kg dry	33.737	2.66 U	109	85-134	11.1	40
Surrogate: Tetrachloro-meta-xylene	*36.4*		*ug/kg dry*	*33.741*		*108*	*28-166*		
Surrogate: Decachlorobiphenyl	*35.9*		*ug/kg dry*	*33.737*		*106*	*37-153*		

Date: 7 March 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Sites – Soil Full Protocol - Waste Site 600-205
Subject: Inorganic - Data Package No. K2419-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2419 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	Analyte
J1C3H3	9/27/10	Soil	C	See note 1
J1C3H4	9/27/10	Soil	C	See note 1
J1C3H5	9/27/10	Soil	C	See note 1
J1C3H6	9/27/10	Soil	C	See note 1
J1C3H7	9/27/10	Soil	C	See note 1
J1C3H8	9/27/10	Soil	C	See note 1

1 - ICP metals (6010B).

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. 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 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 "UJ". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

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

All preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J1C3H8) was submitted for analysis. Aluminum, barium, beryllium, calcium, iron, lead, magnesium, manganese, potassium, silicon, vanadium and zinc were detected in the field blank. Under the WCH statement of work, no qualification is required.

- **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, all antimony (31%), calcium (40%), magnesium (56%), silicon (188%) and vanadium (67%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all aluminum (133%), antimony (66%) and silicon (31%) 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

One set of field duplicates (J1C3H3/J1C3H7) was submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

- **Completeness**

Data package No. K2419 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, all antimony (31%), calcium (40%), magnesium (56%), silicon (188%) and vanadium (67%) results were qualified as estimates and flagged "J".

- Due to LCS recoveries outside QC limits, all aluminum (133%), antimony (66%) and silicon (31%) 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.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

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: K2419	REVIEWER: ELR	Project: 600-205	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony calcium magnesium silicon vanadium	J	All	MS recovery
Aluminum antimony 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

Annotated Laboratory Reports

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H3
1009156-01 (Soil)

3/5/11

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	6240	J	4.04	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.485	U J	0.485	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	3.18		0.808	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	61.1		0.404	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.239		0.162	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	0.959	B	1.62	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.111	B	0.162	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	4400	J	80.8	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	6.78		0.162	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	6.36		1.62	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	11.1		0.808	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	19200		16.2	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	4.42		0.404	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	3930	J	60.6	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	284		4.04	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	0.269	B	1.62	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	7.96		3.23	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	1130		323	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.242	U	0.242	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	144	J	1.62	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.162	U	0.162	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	283		40.4	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	52.1	J	2.02	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	38.1		8.08	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H4
1009156-02 (Soil)

3/5/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	9110	J	4.89	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.586	U J	0.586	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	5.42		0.977	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	70.4		0.489	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.384		0.195	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	1.38	B	1.95	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.113	B	0.195	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	5990	J	97.7	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	9.42		0.195	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	9.09		1.95	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	18.0		0.977	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	24600		19.5	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	6.90		0.489	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	5250	J	73.3	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	371		4.89	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	0.360	B	1.95	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	10.7		3.91	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	1650		391	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.293	U	0.293	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	168	J	1.95	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.195	U	0.195	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	540		48.9	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	59.5	J	2.44	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	49.0		9.77	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H5
1009156-03 (Soil)

3/5/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	7090	J	3.97	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.476	U J	0.476	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	2.96		0.794	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	72.2		0.397	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.254		0.159	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	1.24	B	1.59	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.250		0.159	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	3310	J	79.4	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	8.26		0.159	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	6.22		1.59	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	13.2		0.794	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	19600		15.9	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	12.0		0.397	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	3870	J	59.6	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	303		3.97	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	0.272	B	1.59	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	8.54		3.18	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	1580		318	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.238	U	0.238	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	169	J	1.59	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.159	U	0.159	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	199		39.7	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	51.5	J	1.99	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	45.2		7.94	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H6
1009156-04 (Soil)

3/5/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	7590	J	4.28	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.513	U J	0.513	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	3.18		0.856	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	75.0		0.428	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.275		0.171	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	1.26	B	1.71	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.192		0.171	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	3670	J	85.6	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	9.02		0.171	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	6.81		1.71	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	12.1		0.856	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	20400		17.1	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	8.08		0.428	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	4040	J	64.2	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	318		4.28	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	0.287	B	1.71	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	9.23		3.42	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	1670		342	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.257	U	0.257	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	182	J	1.71	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.171	U	0.171	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	200		42.8	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	53.0	J	2.14	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	45.7		8.56	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H7
1009156-05 (Soil)

3/5/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	6380	J	3.29	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.395	U J	0.395	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	3.45		0.658	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	59.9		0.329	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.251		0.132	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	0.885	B	1.32	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.103	B	0.132	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	4910	J	65.8	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	6.91		0.132	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	6.66		1.32	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	11.3		0.658	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	19600		13.2	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	4.76		0.329	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	3950	J	49.4	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	299		3.29	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	0.259	B	1.32	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	8.58		2.63	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	1120		263	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.197	U	0.197	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	109	J	1.32	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.132	U	0.132	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	319		32.9	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	54.5	J	1.65	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	39.6		6.58	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

J1C3H8
1009156-06 (Soil)

3/5/4

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	159	J	3.38	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Antimony	0.406	U J	0.406	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Arsenic	0.676	U	0.676	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Barium	1.81		0.338	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Beryllium	0.131	B	0.135	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Boron	1.35	U	1.35	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cadmium	0.135	U	0.135	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Calcium	33.7	B J	67.6	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Chromium	0.135	U	0.135	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Cobalt	1.35	U	1.35	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Copper	0.676	U	0.676	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Iron	541		13.5	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Lead	0.455		0.338	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Magnesium	20.1	B J	50.7	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Manganese	6.94		3.38	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Molybdenum	1.35	U	1.35	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Nickel	2.70	U	2.70	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Potassium	38.4	B	270	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Selenium	0.203	U	0.203	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silicon	70.3	J	1.35	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Silver	0.135	U	0.135	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Sodium	33.8	U	33.8	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Vanadium	0.237	B J	1.69	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B
Zinc	1.37	B	6.76	mg/kg dry	1	L010208	10/15/2010	10/19/2010	6010B

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-142
LVL#: 1009156
SDG/SAF#: K2419/RC-142

W.O.#: 60049-001-001-0001-00
Date Received: 09-29-10

METALS

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) 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 6 soil samples.

2. The samples were prepared and analyzed in accordance with methods listed on the data report forms.

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

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), MB value less than 5% of the RCRA limit, samples were greater than 20X MB value}.

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.

10. The matrix spike (MS) recoveries for 7 analytes were outside the 75-125% control limits.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial

dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1C3H3	Aluminum	22,000	113.0
	Antimony	100	91.8
	Calcium	20,800	92.9
	Iron	42,000	107.6
	Magnesium	21,600	90.8
	Silicon	2,100	109.9
	Vanadium	1,000	93.2

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. 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

10/19/10
Date

alm/09-156

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-142-021	Page 1 of 2

Collector T. Welch-Koelling/R. Berven	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Sites - Soil Full Protocol	Sampling Location 600-205 (Verification)		SAF No. RC-142
Ice Chest No. WCH-08-034	Field Logbook No. EL-1643-2	COA R602052000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES, LIONVILLE	Offsite Property No. A100549		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	250mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	Pesticides - 8081							

Sample No.	Matrix *	Sample Date	Sample Time										
J1C3H3	SOIL	9-27-10	0715	X	X	X	X						
J1C3H4	SOIL		0730	X	X	X	X						
J1C3H5	SOIL		0735	X	X	X	X						
J1C3H6	SOIL		0745	X	X	X	X						
J1C3H7	SOIL	9-27-10	0715	X	X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Berven	9-27-10 1430	C. Martinez/C. Martinez	09/27/10 1430
C. Martinez/C. Martinez	09/27/10 1610	J. E. Bonfil	9-27-10 1610
J. E. Bonfil WCH	9-28-10 1000	FED EX	
FED EX	9-29-10 1000	VICTOR HERNANDEZ	9-29-10 1000

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out 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 - 7471 (CV) 09/27/10

REVIEWED BY JRD DATE 9/28/10

Matrix *
S=Soil
SE=Sediment
SO=Solid
SD=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

WCH-EE-011

000019

000000020

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-142-021	Page 2 of 2

Collector T. Welch-Koelling/R. Berven	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Sites - Soil Full Protocol	Sampling Location 600-205 (Verification)		SAF No. RC-142
Ice Chest No. WCH-05-034	Field Logbook No. EL-1643-2	COA R602052000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A100549		Bill of Lading/Air Bill No. See OSPC

000000021

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	250mL	120mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D+	PAHs - 8310	Pesticides - 8081							

Sample No.	Matrix *	Sample Date	Sample Time										
J1C3H8	SOIL	9-27-10	0705	X	N/A	N/A	N/A						

000020

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From R. Berven	9-27-10 1430	Received By/Stored In S. Martinez/S. Martinez	1430 09/27/10
Relinquished By/Removed From S. Martinez/S. Martinez	1610 09/27/10	Received By/Stored In J. E. Benbal	1610 9-27-10
Relinquished By/Removed From J. E. Benbal WCH	1000 9-28-10	Received By/Stored In FED EX	
Relinquished By/Removed From FED EX	9-29-10 1000	Received By/Stored In Victor Hernandez	9-29-10 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out 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 - 7471 - (CV)~~ 09/27/10

REVIEWED BY JPH DATE 9/28/10

Matrix *

S=Soil
SS=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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-205			DATA PACKAGE: K2419		
VALIDATOR: ELR		LAB: LLI		DATE: 3/5/11	
			SDG: K2419		

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

SAMPLES/MATRIX					
J1C3H3	J1C3H4	J1C3H5	J1C3H6	J1C3H7	J1C3H8
					soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

FB - 12 detects

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 (31%) calcium (40%) magnesium (56%)
silicon (188%) vanadium (67%) - J all

LCS - aluminum (133%) antimony (66%)
silicon (31%) - J all

no PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010208 - SW 3050B										
Blank (L010208-BLK1)				Prepared: 10/15/2010 Analyzed: 10/19/2010						
Aluminum	3.38	U	3.38	mg/kg wet						
Antimony	0.405	U	0.405	mg/kg wet						
Arsenic	0.676	U	0.676	mg/kg wet						
Barium	0.338	U	0.338	mg/kg wet						
Beryllium	0.135	U	0.135	mg/kg wet						
Boron	1.35	U	1.35	mg/kg wet						
Cadmium	0.135	U	0.135	mg/kg wet						
Calcium	67.6	U	67.6	mg/kg wet						
Chromium	0.135	U	0.135	mg/kg wet						
Cobalt	1.35	U	1.35	mg/kg wet						
Copper	0.676	U	0.676	mg/kg wet						
Iron	13.5	U	13.5	mg/kg wet						
Lead	0.338	U	0.338	mg/kg wet						
Magnesium	50.7	U	50.7	mg/kg wet						
Manganese	3.38	U	3.38	mg/kg wet						
Molybdenum	1.35	U	1.35	mg/kg wet						
Nickel	2.70	U	2.70	mg/kg wet						
Potassium	270	U	270	mg/kg wet						
Selenium	0.203	U	0.203	mg/kg wet						
Silicon	1.35	U	1.35	mg/kg wet						
Silver	0.135	U	0.135	mg/kg wet						
Sodium	33.8	U	33.8	mg/kg wet						
Vanadium	1.69	U	1.69	mg/kg wet						
Zinc	6.76	U	6.76	mg/kg wet						
Duplicate (L010208-DUP2)		Source: 1009156-01		Prepared: 10/15/2010 Analyzed: 10/19/2010						
Aluminum	6830		3.86	mg/kg dry		6240			9	20
Antimony	0.463	U	0.463	mg/kg dry		0.485 U				20
Arsenic	3.47		0.771	mg/kg dry		3.18			9	20
Barium	65.9		0.386	mg/kg dry		61.1			8	20
Beryllium	0.266		0.154	mg/kg dry		0.239			10	20
Boron	1.03	B	1.54	mg/kg dry		0.959			7	20
Cadmium	0.133	B	0.154	mg/kg dry		0.111			19	20
Calcium	5040		77.1	mg/kg dry		4400			14	20
Chromium	7.53		0.154	mg/kg dry		6.78			10	20
Cobalt	7.17		1.54	mg/kg dry		6.36			12	20
Copper	11.6		0.771	mg/kg dry		11.1			5	20

LIONVILLE LABORATORY
A division of Pearson Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010208 - SW 3050B										
Duplicate (L010208-DUP2)		**Source: 1009156-01**		**Prepared: 10/15/2010 Analyzed: 10/19/2010**						
Iron	20700		15.4	mg/kg dry		19200			8	20
Lead	5.13		0.386	mg/kg dry		4.42			15	20
Magnesium	4290		57.9	mg/kg dry		3930			9	20
Manganese	337		3.86	mg/kg dry		284			17	20
Molybdenum	0.270	B	1.54	mg/kg dry		0.269			0.5	20
Nickel	9.23		3.09	mg/kg dry		7.96			15	20
Potassium	1240		309	mg/kg dry		1130			10	20
Selenium	0.231	U	0.231	mg/kg dry		0.242 U				20
Silicon	179		1.54	mg/kg dry		144			22*	20
Silver	0.154	U	0.154	mg/kg dry		0.162 U				20
Sodium	312		38.6	mg/kg dry		283			10	20
Vanadium	57.3		1.93	mg/kg dry		52.1			10	20
Zinc	42.3		7.71	mg/kg dry		38.1			10	20
Matrix Spike (L010208-MS2)		**Source: 1009156-01**		**Prepared: 10/15/2010 Analyzed: 10/19/2010**						
Aluminum	9880		4.24	mg/kg dry	169.46	6240	2150*	75-125		
Antimony	13.3		0.508	mg/kg dry	42.365	0.485 U	31*	75-125		
Arsenic	142		0.847	mg/kg dry	169.46	3.18	82	75-125		
Barium	225		0.424	mg/kg dry	169.46	61.1	97	75-125		
Beryllium	3.72		0.169	mg/kg dry	4.2365	0.239	82	75-125		
Boron	67.5		1.69	mg/kg dry	84.730	0.959	79	75-125		
Cadmium	3.63		0.169	mg/kg dry	4.2365	0.111	83	75-125		
Calcium	5250		84.7	mg/kg dry	2118.3	4400	40*	75-125		
Chromium	23.7		0.169	mg/kg dry	16.946	6.78	100	75-125		
Cobalt	40.5		1.69	mg/kg dry	42.365	6.36	81	75-125		
Copper	29.4		0.847	mg/kg dry	21.183	11.1	86	75-125		
Iron	18100		16.9	mg/kg dry	84.730	19200	-1260*	75-125		
Lead	36.9		0.424	mg/kg dry	42.365	4.42	77	75-125		
Magnesium	5130		63.5	mg/kg dry	2118.3	3930	56*	75-125		
Manganese	335		4.24	mg/kg dry	42.365	284	121	75-125		
Molybdenum	72.2		1.69	mg/kg dry	84.730	0.269	85	75-125		
Nickel	43.6		3.39	mg/kg dry	42.365	7.96	84	75-125		
Potassium	3570		339	mg/kg dry	2118.3	1130	115	75-125		
Selenium	128		0.254	mg/kg dry	169.46	0.242 U	76	75-125		
Silicon	303		1.69	mg/kg dry	84.730	144	188*	75-125		
Silver	3.26		0.169	mg/kg dry	4.2365	0.162 U	77	75-125		
Sodium	2120		42.4	mg/kg dry	2118.3	283	87	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/20/2010 13:00

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010208 - SW 3050B									
Matrix Spike (L010208-MS2)		**Source: 1009156-01**		Prepared: 10/15/2010 Analyzed: 10/19/2010					
Vanadium	80.3	2.12	mg/kg dry	42.365	52.1	67*	75-125		
Zinc	71.2	8.47	mg/kg dry	42.365	38.1	78	75-125		
Reference (L010208-SRM1)				Prepared: 10/15/2010 Analyzed: 10/19/2010					
Aluminum	8970	12.3	mg/kg wet	6766.6		133	0-225.5		
Antimony	37.2	1.48	mg/kg wet	56.630		66	0-225.6		
Arsenic	109	2.46	mg/kg wet	113.85		96	85-115		
Barium	300	1.23	mg/kg wet	298.35		101	75.7-124.3		
Beryllium	103	0.492	mg/kg wet	108.32		95	85.2-114.8		
Boron	73.8	4.92	mg/kg wet	86.580		85	68.5-131.6		
Cadmium	219	0.492	mg/kg wet	224.09		98	84.9-115.1		
Calcium	3150	246	mg/kg wet	3305.9		95	82.8-117.2		
Chromium	77.2	0.492	mg/kg wet	77.590		99	76.8-123.2		
Cobalt	159	4.92	mg/kg wet	163.19		97	79.4-120.6		
Copper	257	2.46	mg/kg wet	265.65		97	82.4-117.6		
Iron	8320	49.2	mg/kg wet	8202.8		101	78.9-121.1		
Lead	182	1.23	mg/kg wet	187.62		97	81.5-118.5		
Magnesium	7450	184	mg/kg wet	8352.3		89	84.2-115.8		
Manganese	903	12.3	mg/kg wet	951.35		95	69-131		
Molybdenum	231	4.92	mg/kg wet	234.78		98	80.1-119.9		
Nickel	214	9.84	mg/kg wet	220.85		97	81.4-118.6		
Potassium	13600	984	mg/kg wet	14177		96	85.7-114.3		
Selenium	172	0.738	mg/kg wet	187.99		91	78.8-121.2		
Silicon	287	4.92	mg/kg wet	939.78		31	0-272.3		
Silver	80.7	0.492	mg/kg wet	83.960		96	81.9-118.1		
Sodium	9350	123	mg/kg wet	9587.1		98	83.5-116.4		
Vanadium	102	6.15	mg/kg wet	97.430		105	75.8-124.2		
Zinc	191	24.6	mg/kg wet	196.52		97	78.9-121.1		

Date: 7 March 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: 100-IU-2 & 100-IU-6 Remaining Sites – Soil Full Protocol - Waste Site 600-205
Subject: Diesel Range Organics - Data Package No. K2419-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K2419 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	Analyte
J1C3H3	9/27/10	Soil	C	See note 1
J1C3H4	9/27/10	Soil	C	See note 1
J1C3H5	9/27/10	Soil	C	See note 1
J1C3H6	9/27/10	Soil	C	See note 1
J1C3H7	9/27/10	Soil	C	See note 1

1 – Diesel range organics by 8015B.

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. Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY 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 acceptable.

- **Method Blanks**

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

All method blank results were acceptable.

Field Blanks

No field blank was 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.

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

All other 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 the lack of a matrix spike and matrix spike duplicate analysis, all motor oil results were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (32%), all diesel range organic results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1C3H3/J1C3H7) was submitted for analysis. Laboratory duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K2419 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 deficiency was noted:

- Due to the lack of a matrix spike, matrix spike duplicate and LCS analysis, all motor oil results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits (32%), all diesel range organic 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.

REFERENCES

Washington Closure Hanford Contract #S00W307A00 (March 2008), *Data Validation Services*, March 2008.

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

DIESEL RANGE ORGANICS DATA QUALIFICATION SUMMARY*

SDG: K2419	REVIEWER: ELR	Project: 600-205	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Motor oil	J	All	No MS, MSD or LCS analysis
Diesel range organics	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

Annotated Laboratory Reports

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-142 Project Number: K2419 Project Manager: Joan Kessner	Reported: 10/12/2010 21:27

3/5/11

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1C3H3 (1009156-01) Soil								
Surrogate: p-Terphenyl	*94 %*	*39-129*			*L009416*	*09/30/2010*	*10/05/2010*	*8015M*
Diesel Range Organics	96300 J	3250	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
Motor Oil	181000 J	9760	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
J1C3H4 (1009156-02) Soil								
Surrogate: p-Terphenyl	*98 %*	*39-129*			*L009416*	*09/30/2010*	*10/05/2010*	*8015M*
Diesel Range Organics	3540 U J	3540	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
Motor Oil	7860 J J	10600	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
J1C3H5 (1009156-03) Soil								
Surrogate: p-Terphenyl	*58 %*	*39-129*			*L009416*	*09/30/2010*	*10/05/2010*	*8015M*
Diesel Range Organics	3390 U J	3390	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
Motor Oil	64700 J	10200	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
J1C3H6 (1009156-04) Soil								
Surrogate: p-Terphenyl	*71 %*	*39-129*			*L009416*	*09/30/2010*	*10/05/2010*	*8015M*
Diesel Range Organics	3370 U J	3370	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
Motor Oil	103000 J	10100	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
J1C3H7 (1009156-05) Soil								
Surrogate: p-Terphenyl	*110 %*	*39-129*			*L009416*	*09/30/2010*	*10/05/2010*	*8015M*
Diesel Range Organics	118000 J	3400	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M
Motor Oil	221000 J	10200	ug/kg dry	1	L009416	09/30/2010	10/05/2010	8015M

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-142 K2419
LVL #: 1009156

W.O. #: 60049-001-001-0001-00
Date Received: 09-29-2010

DIESEL RANGE ORGANICS

Five (5) soil samples were collected on 09-27-2010.

The samples and associated QC samples were extracted 09-30-2010 and analyzed 10-04,05-2010 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. The blank spike recovery was within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The samples were 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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

10/19/10
Date

r:\group\data\2010\dro\wc-hanford\1009156jes.doc

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-142-021	Page 1 of 2

Collector T. Welch-Koelling/R. Berven	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 100-IU-2 & 100-IU-6 Remaining Sites - Soil Full Protocol	Sampling Location 600-205 (Verification)		SAF No. RC-142
Ice Chest No. WCH-08-034	Field Logbook No. EL-1643-2	COA R602052000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A100549		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 Deg C

000013

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C								
Type of Container	G/P	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	250mL	120mL	250mL	120mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PAHs - 8310	Pesticides - 8081								
Sample No.	Matrix *	Sample Date	Sample Time									
J1C3H3	SOIL	9-27-10	0715	X	X	X	X					
J1C3H4	SOIL	|	0730	X	X	X	X					
J1C3H5	SOIL	|	0735	X	X	X	X					
J1C3H6	SOIL	|	0745	X	X	X	X					
J1C3H7	SOIL	9-27-10	0715	X	X	X	X					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From E. BERVEN	9-27-10 1430	Received By/Stored In C Martinez/C Martinez	1430 09/27/10
Relinquished By/Removed From C Martinez/C Martinez	09/27/10 1610	Received By/Stored In J. E. Bond	1610 9-27-10
Relinquished By/Removed From J. E. Bond / WCH	9-28-10 1000	Received By/Stored In FED EX	
Relinquished By/Removed From FED EX	9-29-10 1000	Received By/Stored In VICTOR HERNANDEZ	9-29-10 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out 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 - 7471~~ (CV) 09/27/10

REVIEWED BY JRA DATE 9/28/10

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

WCH-EE-011

000000009

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Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 600-265			DATA PACKAGE: K2419		
VALIDATOR: ELR		LAB: LLI		DATE: 3/5/11	
			SDG: K2419		

ANALYSES PERFORMED					
8015	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	

SAMPLES/MATRIX:					
J1C3H4	J1C3H4	J1C3H5	J1C3H6	J1C3H7	
					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)

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:

GENERAL 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: 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 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

MO - no LCS/MS/MSD - J all

GENERAL ORGANIC 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: DRO - 32% - J all

No MO MS/MSD - J all

6. HOLDING TIMES (all levels)

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

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

Comments:

GENERAL ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

Comments: _____

Appendix 6

Additional Documentation Requested by Client

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-142	
2620 Fermi Avenue	Project Number: K2419	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/12/2010 21:27

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L009416 - SW 3540C									
Blank (L009416-BLK1)			Prepared: 09/30/2010 Analyzed: 10/04/2010						
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*5100*		*ug/kg wet*	*6666.7*		*76*	*39-129*		
LCS (L009416-BS1)			Prepared: 09/30/2010 Analyzed: 10/04/2010						
Diesel Range Organics	65000	3330	ug/kg wet	66667		98	42-133		
Surrogate: p-Terphenyl	*5330*		*ug/kg wet*	*6666.7*		*80*	*39-129*		
Matrix Spike (L009416-MS2)		Source: 1009156-01	Prepared: 09/30/2010 Analyzed: 10/05/2010						
Diesel Range Organics	149000	3410	ug/kg dry	68299	96300	76	42-133		
Surrogate: p-Terphenyl	*7000*		*ug/kg dry*	*6829.9*		*102*	*39-129*		
Matrix Spike Dup (L009416-MSD2)		Source: 1009156-01	Prepared: 09/30/2010 Analyzed: 10/05/2010						
Diesel Range Organics	134000	3430	ug/kg dry	68662	96300	56	42-133	32	40
Surrogate: p-Terphenyl	*5240*		*ug/kg dry*	*6866.2*		*76*	*39-129*		