

SAF-RC-029
Remaining Sites Confirmation Sampling
– Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt (2) H4-21

COMMENTS:

SDG K3859 SAF-RC-029

Waste Site: 300-286

Date: 21 May 2012
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: Remaining Sites Confirmation Sampling – Soil Full Protocol – Waste Site
 300-286
 Subject: Inorganics - Data Package No. K3859-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3859 prepared by Lionville Laboratories 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
J1N319	4/4/12	Soil	C	See note 1
J1N320	4/4/12	Soil	C	See note 1
J1N321	4/4/12	Soil	C	See note 1
J1N322	4/4/12	Soil	C	See note 1

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

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

Preparation (Method) Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "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 (J1N319) was submitted for analysis. Fourteen analytes 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 matrix spike recoveries outside QC limits, all antimony (23.5%) and silicon (44.8%) results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all aluminum (142%) and silicon (33.9%) 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 (J1N320/J1N321) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the 300 Area RQLs to ensure that laboratory detection levels meet the required criteria. All results met the RQL.

Completeness

Data package No. K3859 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 matrix spike recoveries outside QC limits, all antimony (23.5%) and silicon (44.8%) results were qualified as estimates and flagged "J".
- Due to LCS recoveries outside QC limits, all aluminum (142%) and silicon (33.9%) 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-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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

INORGANICS DATA QUALIFICATION SUMMARY*

SDG: K3859	REVIEWER: ELR	Project: 300-286	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony silicon	J	All	Matrix spike recovery
Aluminum 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-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/19/2012 13:15

J1N319
 1204027-01 (Soil)

SK 2012

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Metals by SW846 6000/7000 series								
Aluminum	261 J	3.43	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Antimony	0.411 UJ	0.411	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Arsenic	0.685 U	0.685	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Barium	2.17	0.343	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Beryllium	0.0443 B	0.137	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Boron	1.37 U	1.37	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cadmium	0.137 U	0.137	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Calcium	46.4 B	68.5	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Chromium	0.164	0.137	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cobalt	1.37 U	1.37	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Copper	0.685 U	0.685	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Iron	433	13.7	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Lead	0.434	0.343	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Magnesium	33.5 B	51.4	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Manganese	6.97	3.43	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Molybdenum	1.37 U	1.37	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Nickel	2.74 U	2.74	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Potassium	53.8 B	274	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Selenium	0.206 U	0.206	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silicon	96.8 J	1.37	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silver	0.137 U	0.137	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Sodium	8.74 B	34.3	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Vanadium	0.339 B	1.71	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Zinc	1.76 B	6.85	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Mercury	0.0257 U	0.0257	mg/kg dry	1	L204140	04/12/2012	04/13/2012	7471A



264 Welsh Pool Road
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 Phone: 610-280-3000
 Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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JIN320
 1204027-02 (Soil)

V
 5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminum	12600	J	5.60	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Antimony	0.672	UJ	0.672	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Arsenic	8.92		1.12	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Barium	67.7		0.560	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Beryllium	0.442		0.224	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Boron	2.74		2.24	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cadmium	0.595		0.224	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Calcium	4650		112	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Chromium	21.0		0.224	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cobalt	9.75		2.24	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Copper	70.6		1.12	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Iron	39000		22.4	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Lead	246		0.560	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Magnesium	5320		84.0	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Manganese	657		5.60	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Molybdenum	1.44	B	2.24	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Nickel	33.8		4.48	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Potassium	1780		448	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Selenium	0.336	U	0.336	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silicon	296	J	2.24	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silver	0.224	U	0.224	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Sodium	449		56.0	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Vanadium	80.7		2.80	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Zinc	672		11.2	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Mercury	0.131		0.0320	mg/kg dry	1	L204140	04/12/2012	04/13/2012	7471A

000000037



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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/19/2012 13:15

JIN321
 1204027-03 (Soil)

✓ 5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	12400	5.18	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Antimony	0.621	0.621	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Arsenic	7.46	1.04	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Barium	65.1	0.518	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Beryllium	0.411	0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Boron	2.31	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cadmium	0.376	0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Calcium	4130	104	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Chromium	22.6	0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cobalt	9.36	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Copper	64.5	1.04	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Iron	30900	20.7	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Lead	250	0.518	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Magnesium	5300	77.6	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Manganese	606	5.18	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Molybdenum	1.24	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Nickel	31.6	4.14	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Potassium	1750	414	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Selenium	0.311	0.311	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silicon	273	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silver	0.207	0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Sodium	417	51.8	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Vanadium	75.6	2.59	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Zinc	520	10.4	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Mercury	0.0846	0.0307	mg/kg dry	1	L204140	04/12/2012	04/13/2012	7471A



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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J1N322
1204027-04 (Soil)

5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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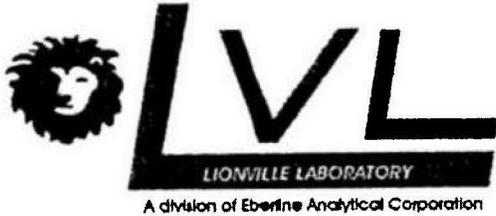
Lionville Laboratory

Metals by SW846 6000/7000 series

Aluminium	6990	J	5.18	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Antimony	0.621	U J	0.621	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Arsenic	2.56		1.04	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Barium	59.1		0.518	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Beryllium	0.271		0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Boron	1.13	B	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cadmium	0.286		0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Calcium	4680		104	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Chromium	8.29		0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Cobalt	6.84		2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Copper	21.2		1.04	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Iron	23600		20.7	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Lead	24.7		0.518	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Magnesium	4080		77.7	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Manganese	328		5.18	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Molybdenum	0.508	B	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Nickel	10.7		4.14	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Potassium	1070		414	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Selenium	0.311	U	0.311	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silicon	333	J	2.07	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Silver	0.207	U	0.207	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Sodium	422		51.8	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Vanadium	71.3		2.59	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Zinc	194		10.4	mg/kg dry	1	L204109	04/11/2012	04/12/2012	6010B
Mercury	0.0264	U	0.0264	mg/kg dry	1	L204140	04/12/2012	04/13/2012	7471A

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



264 Welsh Pool Road
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Phone (610) 280-3000
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Case Narrative
*****REVISION*****

This package is revised to include the second paragraph in narrative statement item #2.

Client: WC-HANFORD RC-029
LVL#: 1204027
SDG/SAF#: K3859/RC-029

W.O.#: 60049-001-001-0001-00
Date Received: 04-06-12

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

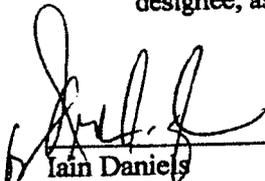
The metals internal standard, Yttrium, was not used in the calculation of these data due to the analyst inadvertently chose an instrument method that does not use an internal standard. As per method 6010B an internal standard is required when samples are not digested, not matrix matched, or physical interferences are present.

3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ) with the exception of CCB2 and CCB3 for Iron (64.6 µg/L and 93.6 µg/L, RDL equivalent =50 µg/L).
7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, 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:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
J1N320	Aluminum	22,000	111.8
	Antimony	100	101.2
	Iron	42,000	92.1
	Lead	100	176.0
	Manganese	1,000	109.6
	Silicon	2,100	146.9
	Zinc	600	76.6

12. All duplicate analysis were within the 20% Relative Percent Difference (RPD) control limit criteria. The $\pm 20\%$ 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

4/20/12
 Date

alm/04-027

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-029-131		Page 1 of 1						
Collector STOWE		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8C		Data Turnaround 15 Days					
Project Designation Remaining Sites Confirmation Sampling - Soil Full Protocol		Sampling Location 300-286		SAF No. RC-029											
Ice Chest No. NA #342-12 RCC-07-015		Field Logbook No. EL-1601-06		COA C30286A000		Method of Shipment FED EX									
Shipped To EDERLINE SERVICES (LIONVILLE)		Offsite Property No. A110285		Bill of Lading/Air Bill No. NA # 4-4-12		See OSPC									
POSSIBLE SAMPLE HAZARDS/REMARKS Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly. Special Handling and/or Storage Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.				Preservation		Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None				
				Type of Container		G/P	G/P	G/P	aG	aG	G/P				
				No. of Container(s)		1	1	1	1	1					
				Volume		60mL	60mL	60mL	120mL	120mL					
SAMPLE ANALYSIS				See Item (1) in Special Instructions.	Chromium Hex - 7195	PAHs - 8310	PCBs - 8082	KCP GEA Shipping Screen							
Sample No.	Matrix *	Sample Date	Sample Time												
J1N319	SOIL	4/4/12	0920	X											
J1N320	SOIL	4/4/12	0930	X	X		X	X							
J1N321	SOIL	4/4/12	0935	X	X		X	X							
J1N322	SOIL	4/4/12	0945	X	X		X	X							
J1N323-BH	SOIL	4/4/12													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS							
Relinquished By/Removed From Quincy Stowe		Date/Time 4-4-12 1530		Received By/Stored In BHUDSON BLUDEN		Date/Time 4/4/12 1530		(1) KCP 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)							
Relinquished By/Removed From BHUDSON BLUDEN		Date/Time 4/4/12 1605		Received By/Stored In A. Frier G. Jruin		Date/Time 4-4-12 1605									
Relinquished By/Removed From A. Frier G. Jruin		Date/Time 4-5-12		Received By/Stored In Fed Ex		Date/Time									
Relinquished By/Removed From Fed Ex		Date/Time 4-6-12 0935		Received By/Stored In VICTOR HERNANDEZ		Date/Time 4-6-12 0935									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SS=Soil/mud SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trash W/W=Wipes L=Liquid V=Vegetation X=Other							
LABORATORY SECTION		Received By		Title								Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By								Date/Time			

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Appendix 5
Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	300-286		DATA PACKAGE: K3859		
VALIDATOR:	ELR	LAB:	LLP	DATE: 5/20/12	
			SDG:	K3859	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J1N319	J1N320	J1N321	J1N322		
					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 - 14 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 (23.5%) silicon (44.8%)
LCS - aluminum + silicon (Jal)

no PA

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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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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
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Batch L204109 - SW 3050B

Blank (L204109-BLK1)		Prepared: 04/11/2012 Analyzed: 04/12/2012							
Aluminum	4.31 U	4.31	mg/kg wet						
Antimony	0.517 U	0.517	mg/kg wet						
Arsenic	0.862 U	0.862	mg/kg wet						
Barium	0.431 U	0.431	mg/kg wet						
Beryllium	0.172 U	0.172	mg/kg wet						
Boron	1.72 U	1.72	mg/kg wet						
Cadmium	0.172 U	0.172	mg/kg wet						
Calcium	5.39 B	86.2	mg/kg wet						
Chromium	0.172 U	0.172	mg/kg wet						
Cobalt	1.72 U	1.72	mg/kg wet						
Copper	0.862 U	0.862	mg/kg wet						
Iron	17.2 U	17.2	mg/kg wet						
Lead	0.431 U	0.431	mg/kg wet						
Magnesium	0.976 B	64.7	mg/kg wet						
Manganese	4.31 U	4.31	mg/kg wet						
Molybdenum	1.72 U	1.72	mg/kg wet						
Nickel	3.45 U	3.45	mg/kg wet						
Potassium	345 U	345	mg/kg wet						
Selenium	0.259 U	0.259	mg/kg wet						
Silicon	1.72 U	1.72	mg/kg wet						
Silver	0.172 U	0.172	mg/kg wet						
Sodium	43.1 U	43.1	mg/kg wet						
Vanadium	2.16 U	2.16	mg/kg wet						
Zinc	8.62 U	8.62	mg/kg wet						

Duplicate (L204109-DUP1)		Source: 1204027-02		Prepared: 04/11/2012 Analyzed: 04/12/2012					
Aluminum	13600	5.04	mg/kg dry		12600			7.90	20
Antimony	0.605 U	0.605	mg/kg dry		0.672 U				20
Arsenic	9.16	1.01	mg/kg dry		8.92			2.68	20
Barium	70.8	0.504	mg/kg dry		67.7			4.50	20
Beryllium	0.453	0.202	mg/kg dry		0.442			2.45	20
Boron	2.69	2.02	mg/kg dry		2.74			1.54	20
Cadmium	0.519	0.202	mg/kg dry		0.595			13.5	20
Calcium	4690	101	mg/kg dry		4650			0.829	20
Chromium	22.8	0.202	mg/kg dry		21.0			8.16	20
Cobalt	10.0	2.02	mg/kg dry		9.75			2.59	20
Copper	74.2	1.01	mg/kg dry		70.6			4.96	20

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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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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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 L204109 - SW 3050B									
Duplicate (L204109-DUP1)		Source: 1204027-02		Prepared: 04/11/2012 Analyzed: 04/12/2012					
Iron	34900	20.2	mg/kg dry		39000			11.2	20
Lead	275	0.504	mg/kg dry		246			11.2	20
Magnesium	5680	75.6	mg/kg dry		5320			6.62	20
Manganese	666	5.04	mg/kg dry		657			1.37	20
Molybdenum	1.25	B 2.02	mg/kg dry		1.44			14.4	20
Nickel	37.6	4.03	mg/kg dry		33.8			10.5	20
Potassium	1870	403	mg/kg dry		1780			5.29	20
Selenium	0.302	U 0.302	mg/kg dry		0.336 U				20
Silicon	282	2.02	mg/kg dry		296			4.84	20
Silver	0.202	U 0.202	mg/kg dry		0.224 U				20
Sodium	492	50.4	mg/kg dry		449			9.30	20
Vanadium	82.2	2.52	mg/kg dry		80.7			1.89	20
Zinc	651	10.1	mg/kg dry		672			3.21	20
Matrix Spike (L204109-MS1)		Source: 1204027-02		Prepared: 04/11/2012 Analyzed: 04/12/2012					
Aluminum	14800	4.73	mg/kg dry	189.02	12600	1210*	75-125		20
Antimony	11.1	0.567	mg/kg dry	47.256	0.672 U	23.5*	75-125		20
Arsenic	167	0.945	mg/kg dry	189.02	8.92	83.6	75-125		20
Barium	241	0.473	mg/kg dry	189.02	67.7	91.5	75-125		20
Beryllium	4.55	0.189	mg/kg dry	4.7256	0.442	86.9	75-125		20
Boron	73.8	1.89	mg/kg dry	94.511	2.74	75.2	75-125		20
Cadmium	4.40	0.189	mg/kg dry	4.7256	0.595	80.6	75-125		20
Calcium	7170	94.5	mg/kg dry	2362.8	4650	106	75-125		20
Chromium	36.8	0.189	mg/kg dry	18.902	21.0	84.0	75-125		20
Cobalt	47.6	1.89	mg/kg dry	47.256	9.75	80.2	75-125		20
Copper	91.0	0.945	mg/kg dry	23.628	70.6	86.3	75-125		20
Iron	34000	18.9	mg/kg dry	94.511	39000	-5340*	75-125		20
Lead	322	0.473	mg/kg dry	47.256	246	162*	75-125		20
Magnesium	7620	70.9	mg/kg dry	2362.8	5320	97.3	75-125		20
Manganese	751	4.73	mg/kg dry	47.256	657	198*	75-125		20
Molybdenum	77.8	1.89	mg/kg dry	94.511	1.44	80.8	75-125		20
Nickel	71.8	3.78	mg/kg dry	47.256	33.8	80.4	75-125		20
Potassium	4030	378	mg/kg dry	2362.8	1780	95.6	75-125		20
Selenium	151	0.284	mg/kg dry	189.02	0.336 U	80.1	75-125		20
Silicon	339	1.89	mg/kg dry	94.511	296	44.8*	75-125		20
Silver	4.32	0.189	mg/kg dry	4.7256	0.224 U	91.4	75-125		20
Sodium	2740	47.3	mg/kg dry	2362.8	449	96.9	75-125		20

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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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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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 L204109 - SW 3050B									
Matrix Spike (L204109-MS1)		Source: 1204027-02		Prepared: 04/11/2012		Analyzed: 04/12/2012			
Vanadium	125	2.36	mg/kg dry	47.256	80.7	93.5	75-125		20
Zinc	656	9.45	mg/kg dry	47.256	672	-32.5*	75-125		20
Reference (L204109-SRM1)				Prepared: 04/11/2012		Analyzed: 04/12/2012			
Aluminum	9460	10.6	mg/kg wet	6670.0		142	0-200.89		
Antimony	37.8	1.27	mg/kg wet	53.000		71.3	0-235.8		
Arsenic	112	2.11	mg/kg wet	114.00		98.3	82.8-117.54		
Barium	284	1.06	mg/kg wet	307.00		92.6	79.8-120.2		
Beryllium	103	0.423	mg/kg wet	108.00		95.1	82.8-117.6		
Boron	72.7	4.23	mg/kg wet	85.100		85.5	67.5-132.8		
Cadmium	220	0.423	mg/kg wet	225.00		97.7	83.6-116.4		
Calcium	3300	211	mg/kg wet	3360.0		98.3	83.3-116.9		
Chromium	81.9	0.423	mg/kg wet	77.200		106	73.3-126.4		
Cobalt	159	4.23	mg/kg wet	166.00		95.8	80.7-118.7		
Copper	259	2.11	mg/kg wet	271.00		95.5	80.8-119.2		
Iron	8400	42.3	mg/kg wet	8420.0		99.7	78.6-121.1		
Lead	176	1.06	mg/kg wet	190.00		92.7	81.6-118.4		
Magnesium	7970	158	mg/kg wet	8570.0		93.0	83.2-116.7		
Manganese	1040	10.6	mg/kg wet	965.00		108	69.3-130.5		
Molybdenum	229	4.23	mg/kg wet	235.00		97.3	76.2-123.8		
Nickel	216	8.45	mg/kg wet	221.00		97.8	79.6-120.8		
Potassium	14300	845	mg/kg wet	14400		99.3	81.9-118.1		
Selenium	182	0.634	mg/kg wet	187.00		97.2	75.9-124.6		
Silicon	273	4.23	mg/kg wet	807.00		33.9	0-219.3		
Silver	81.1	0.423	mg/kg wet	83.500		97.2	82.7-117.1		
Sodium	9230	106	mg/kg wet	9730.0		94.8	82.5-117.2		
Vanadium	105	5.28	mg/kg wet	98.700		107	75.9-123.6		
Zinc	194	21.1	mg/kg wet	199.00		97.6	78.4-121.6		



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/19/2012 13:15
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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 L204140 - SW 7471A Prep									
Blank (L204140-BLK1)				Prepared: 04/12/2012 Analyzed: 04/13/2012					
Mercury	0.0281 U	0.0281	mg/kg wet						
Duplicates (L204140-DUP1)				Prepared: 04/12/2012 Analyzed: 04/13/2012					
Mercury	0.0244 U	0.0244	mg/kg dry		0.0264	U			20
Matrix Spike (L204140-MS1)				Prepared: 04/12/2012 Analyzed: 04/13/2012					
Mercury	0.157	0.0244	mg/kg dry	0.13545	0.0264	U	116	75-125	20
Reference (L204140-SRM1)				Prepared: 04/12/2012 Analyzed: 04/13/2012					
Mercury	1.25	0.0281	mg/kg wet	1.2900			97.0	62.6-138	

Date: 21 May 2012
 To: Washington Closure Hanford Inc. (technical representative)
 From: ELR Consulting
 Project: Remaining Sites Confirmation Sampling – Soil Full Protocol – Waste Site
 300-286
 Subject: PCB - Data Package No. K3859-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3859 prepared by Lionville Laboratories 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
J1N320	4/4/12	Soil	C	See note 1
J1N321	4/4/12	Soil	C	See note 1
J1N322	4/4/12	Soil	C	See note 1

1 - PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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

Holding times are not applicable to PCB analytes.

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 a matrix spike recovery outside QC limits (185%), all arochlor-1260 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".

Due to a surrogate recovery outside QC limits, the arcclor-1254 and aroclor-1260 results in sample J1N320 were qualified as estimates and flagged "J".

All other 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 an RPD outside C limits (73%), all aroclor-1260 results were qualified as estimates and flagged "J".

All other laboratory results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1N320/J1N321) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for aroclor-1260 (33%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All undetected analytes in samples J1N320 and J1N321 exceeded the RQL. Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

Completeness

Data package No. K3859 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 (185%), all arochlor-1260 results were qualified as estimates and flagged "J".
- Due to a surrogate recovery outside QC limits, the arochlor-1254 and arochlor-1260 results in sample J1N320 were qualified as estimates and flagged "J".
- Due to an RPD outside C limits (73%), all arochlor-1260 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-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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

PCB DATA QUALIFICATION SUMMARY*

SDG: K3859	REVIEWER: ELR	Project: 300-286	PAGE <u>1</u> OF <u>1</u>
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aroclor-1260	J	All	MS recovery & RPD
Aroclor-1254 Aroclor-1260	J	J1N320	Surrogate 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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/22/2012 08:29
---	---	-------------------------------

J1N320
 1204027-02 (Soil)

5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1221	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1232	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1242	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1248	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1254	431 D J	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1260	786 D J	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1262	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1268	78.1 U	78.1	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Surrogate: Decachlorobiphenyl	154 % *	43-144			L204103	04/10/2012	04/14/2012	8082
Surrogate: Tetrachloro-meta-xylene	123 %	52-141			L204103	04/10/2012	04/14/2012	8082



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-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/22/2012 08:29

JIN321
 1204027-03 (Soil)

✓ 5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1221	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1232	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1242	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1248	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1254	408 D	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1260	563 D J	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1262	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Aroclor 1268	75.6 U	75.6	ug/kg dry	5	L204103	04/10/2012	04/14/2012	8082
Surrogate: Decachlorobiphenyl	99 %	43-144			L204103	04/10/2012	04/14/2012	8082
Surrogate: Tetrachloro-meta-xylene	75 %	52-141			L204103	04/10/2012	04/14/2012	8082



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-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/22/2012 08:29

J1N322
 1204027-04 (Soil)

5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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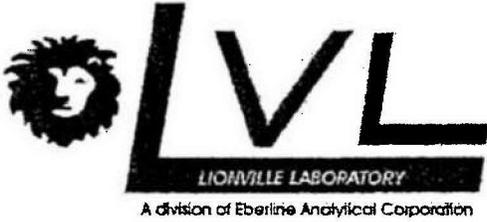
Lionville Laboratory

Polychlorinated Biphenyls by SW846 8082

Aroclor 1016	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1221	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1232	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1242	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1248	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1254	42.6	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1260	94.3 J	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1262	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Aroclor 1268	13.8 U	13.8	ug/kg dry	1	L204103	04/10/2012	04/14/2012	8082
Surrogate: Decachlorobiphenyl	126 %	43-144			L204103	04/10/2012	04/14/2012	8082
Surrogate: Tetrachloro-meta-xylene	88 %	52-141			L204103	04/10/2012	04/14/2012	8082

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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

Case Narrative

Client: WC-HANFORD RC-029 K3859
LVL #: 1204027

W.O. #: 60049-001-001-0001-00
Received: 04-06-2012

PCBs

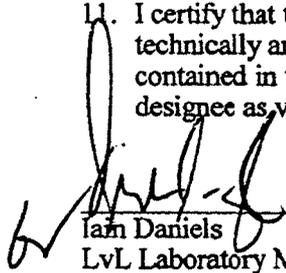
Three (3) soil samples were collected on 04-04-2012.

The samples and associated QC samples were extracted 04-10-2012 and analyzed 04-13,14-2012 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 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

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. Three (3) of fourteen (14) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC079) has been enclosed.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. One (1) of four (4) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC079) has been enclosed.
7. Four (4) samples required instrument dilutions due to high concentrations of target analytes. The samples J1N320, J1N321, J1N322, L204103-MS3 and L204103-MSD3 required a 5-fold dilution. Reporting limits have been adjusted to reflect the necessary dilutions.
8. The samples are reported on a dry weight basis.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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.



Ian Daniels
LvL Laboratory Manager

4/23/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 1260079

Initiator: Catherine Corey Batch: 1204027 Parameter: PCB
 Date: 04/22/12 Samples: 02, ms3, msD3 Matrix: SOIL
 Client: WC Huntford Method: SW846/MCAWW/CLP/ Prep Batch: L804103

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)

PCB Recoveries high in #02 (154%), ms3 (164%), msD3 (157%)
 Aroclor 1260 recovery high in ms3

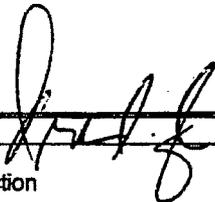
2. Known or Probable Causes(s)

high concentration of target compounds
 (Dilutions necessary)

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)

Narrative
IP

 4/23/12

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

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

5. Final Action...signature/date:

Other Explanation:

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

When Final Action has been recorded, forward original to QA for disposition.

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: _____

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-029-131		Page 1 of 1															
Collector STOWE		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8C		Data Turnaround 15 Days														
Project Designation Remaining Sites Confirmation Sampling - Soil Full Protocol		Sampling Location 300-286		SAF No. RC-029																				
Ice Chest No. NA A344-12 RCC-07-015		Field Logbook No. EL-1601-06		COA C30286A000		Method of Shipment FED EX																		
Shipped To BA 1/23/12 EDERLINE SERVICES / (LIONVILLE)		Offsite Property No. A110285		Bill of Lading/Air Bill No. NA A3 4-4-12		See OSPC																		
POSSIBLE SAMPLE HAZARDS/REMARKS Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly. Special Handling and/or Storage Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.				Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None														
				Type of Container	G/P	G/P	G/P	nG	nG	G/P														
				No. of Container(s)	1	1	1	1	1	1														
				Volume	60mL	60mL	60mL	120mL	120mL	60mL														
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196	PAHs (Soil) - 9045	PAHs - 8310	PCBs - 8082	RCF GBA Shipping Screen															
				Sample No.	Matrix *	Sample Date	Sample Time																	
J1N319	SOIL	4/4/12	0920	x																				
J1N320	SOIL	4/4/12	0930	x	x		x	x																
J1N321	SOIL	4/4/12	0935	x	x		x	x																
J1N322	SOIL	4/4/12	0945	x	x		x	x																
J1N323 BH 4/4/12	SOIL																							
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *												
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(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)				3=Soil 3E=Endrin SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids TW=Tissue WP=Wipe L=Liquid V=Vegetation X=Other												
Quincy Stowe		1530 4-4-12		BHUDSON BHUDSON		4/4/12 1530																		
BHUDSON BHUDSON		4/4/12 1605		A. Freier A. Freier		4-4-12 1605																		
A. Freier A. Freier		4-5-12 1000#1 1530		Fed Ex																				
Fed Ex		4-6-12 0935		NICK HERMAN		4-6-12 0935																		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																		
LABORATORY SECTION		Received By				Title				Date/Time														
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time														

17

000000004



Appendix 5
Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	300-286		DATA PACKAGE: K3859		
VALIDATOR:	ELR	LAB:	LLT	DATE: 5/20/12	
			SDG:	K3859	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10320 J10321 J10322					
soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **6** 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 PK

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

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

Comments: Surr 320 - J all detects no PK
MSB - 1260 - 14590 - 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: _____

FD - 1260 - (3396)

6. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

Comments: _____

PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) Yes No N/A
Compound quantitation acceptable? (Levels D, E) Yes No N/A
Results reported for all requested analyses? Yes No N/A
Results supported in the raw data? (Levels D, E) Yes No N/A
Samples properly prepared? (Levels D, E) Yes No N/A
Detection limits meet RDL? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: all in 20/21 over

9. SAMPLE CLEANUP (Levels D and E)

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

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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/22/2012 08:29
---	---	-------------------------------

Polychlorinated Biphenyls by SW846 8082 - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204103 - SW 3540C										
Blank (L204103-BLK1)					Prepared: 04/10/2012 Analyzed: 04/13/2012					
Aroclor 1016	13.3	U	13.3	ug/kg wet						
Aroclor 1221	13.3	U	13.3	ug/kg wet						
Aroclor 1232	13.3	U	13.3	ug/kg wet						
Aroclor 1242	13.3	U	13.3	ug/kg wet						
Aroclor 1248	13.3	U	13.3	ug/kg wet						
Aroclor 1254	13.3	U	13.3	ug/kg wet						
Aroclor 1260	13.3	U	13.3	ug/kg wet						
Aroclor 1262	13.3	U	13.3	ug/kg wet						
Aroclor 1268	13.3	U	13.3	ug/kg wet						
<i>Surrogate: Decachlorobiphenyl</i>	30.9			ug/kg wet	33.333		93	43-144		
<i>Surrogate: Tetrachloro-meta-xylene</i>	31.9			ug/kg wet	33.337		96	52-141		
LCS (L204103-BS1)					Prepared: 04/10/2012 Analyzed: 04/13/2012					
Aroclor 1016	136		13.3	ug/kg wet	166.67		81	50-138		40
Aroclor 1260	161		13.3	ug/kg wet	166.67		96	50-148		40
<i>Surrogate: Decachlorobiphenyl</i>	36.3			ug/kg wet	33.333		109	43-144		
<i>Surrogate: Tetrachloro-meta-xylene</i>	34.3			ug/kg wet	33.337		103	52-141		
Matrix Spike (L204103-MS3)			Source: 1204027-02		Prepared: 04/10/2012 Analyzed: 04/14/2012					
Aroclor 1016	209	D	79.9	ug/kg dry	200.35	78.1 U	104	50-138		40
Aroclor 1260	1160	D	79.9	ug/kg dry	200.35	786	185*	50-148		40
<i>Surrogate: Decachlorobiphenyl</i>	65.7			ug/kg dry	40.071		164*	43-144		
<i>Surrogate: Tetrachloro-meta-xylene</i>	48.4			ug/kg dry	40.075		121	52-141		
Matrix Spike Dup (L204103-MSD3)			Source: 1204027-02		Prepared: 04/10/2012 Analyzed: 04/14/2012					
Aroclor 1016	191	D	78.4	ug/kg dry	196.58	78.1 U	97	50-138	7	40
Aroclor 1260	955	D	78.4	ug/kg dry	196.58	786	86	50-148	73*	40
<i>Surrogate: Decachlorobiphenyl</i>	61.6			ug/kg dry	39.316		157*	43-144		
<i>Surrogate: Tetrachloro-meta-xylene</i>	46.9			ug/kg dry	39.320		119	52-141		

Date: 21 May 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil Full Protocol – Waste Site
300-286
Subject: Polyaromatic Hydrocarbon - Data Package No. K3859-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3859 prepared by Lionville Laboratories 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
J1N320	4/4/12	Soil	C	See note 1
J1N321	4/4/12	Soil	C	See note 1
J1N322	4/4/12	Soil	C	See note 1

1 – Polyaromatic hydrocarbons by 8310.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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".

Due to method blank contamination, the benz(a)anthracene result in sample J1N322 was raised to the RQL and flagged "U".

All other 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 matrix spike recoveries outside QC limits, all acenaphthene (18%), ideno(1,2,3-cd)pyrene (32%), benzo(b)fluoranthene (43%), dibenz(a,h)anthracene (22%) and benzo(g,h,i)perylene (24%) results were qualified as estimates and fagged "J".

Due to matrix spike duplicate results outside QC limits, all acenaphthene (-1%), ideno(1,2,3-cd)pyrene (29%), benzo(b)fluoranthene (44%), dibenz(a,h)anthracene (23%) and benzo(g,h,i)perylene (24%) 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

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 an RPD outside QC limits, all acenaphthene (232%) results were qualified as estimates and flagged "J".

All other laboratory results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1N320/J1N321) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results are 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. No RQLs were specified.

Completeness

Data package No. K3859 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the benz(a)anthracene result in sample J1N322 was raised to the RQL and flagged "U".
- Due to matrix spike recoveries outside QC limits, all acenaphthene (18%), ideno(1,2,3-cd)pyrene (32%), benzo(b)fluoranthene (43%), dibenz(a,h)anthracene (22%) and benzo(g,h,i)perylene (24%) results were qualified as estimates and fagged "J".
- Due to matrix spike duplicate results outside QC limits, all acenaphthene (-1%), ideno(1,2,3-cd)pyrene (29%), benzo(b)flouranthene (44%), dibenz(a,h)anthracene (23%) and benzo(g,h,i)perylene (24%) results were qualified as estimates and flagged "J".
- Due to an RPD outside QC limits, all acenaphthene (232%) 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-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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: K3859	REVIEWER: ELR	Project: 300-286	PAGE 1 OF 1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Benz(a)anthracene	U at RQL	J1N322	Method blank contamination
Acenaphthene ideno(1,2,3-cd)pyrene benzo(b)fluoranthene dibenz(a,h)anthracene benzo(g,h,i)perylene	J	All	MS and MSD recovery
Acenaphthene	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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/13/2012 12:32
---	---	-------------------------------

J1N320
1204027-02 (Soil)

✓
5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	12.7 J, D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Acenaphthylene	6.63 J, D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Acenaphthene	28.9 D J	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Fluorene	29.7 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Phenanthrene	39.6 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Anthracene	20.1 U	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Fluoranthene	60.4 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Indeno[1,2,3-cd]pyrene	20.1 U J	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Pyrene	43.0 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benz[a]anthracene	25.5 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Chrysene	19.3 J, D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[b] fluoranthene	20.1 U J	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[k] fluoranthene	20.1 U	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[a] pyrene	42.2 D	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Dibenz[a,h]anthracene	20.1 U J	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[g,h,i] perylene	9.44 J, D J	20.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Surrogate: Triphenylene	91 %	68-129			L204079	04/09/2012	04/11/2012	8310



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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/13/2012 12:32
---	---	-------------------------------

J1N321
 1204027-03 (Soil)

✓
 5/20/12

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	88.0 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Acenaphthylene	42.5 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Acenaphthene	19.1 U J	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Fluorene	19.1 U	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Phenanthrene	42.8 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Anthracene	19.1 U	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Fluoranthene	80.1 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Indeno[1,2,3-cd]pyrene	5.74 J, D J	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Pyrene	61.8 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benz[a]anthracene	44.4 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Chrysene	32.3 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[b]fluoranthene	5.16 J, D J	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[k]fluoranthene	19.1 U	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[a]pyrene	37.5 D	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Dibenz[a,h]anthracene	19.1 U J	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Benzo[g,h,i]perylene	16.3 J, D J	19.1	ug/kg dry	5	L204079	04/09/2012	04/11/2012	8310
Surrogate: Triphenylene	92 %	68-129			L204079	04/09/2012	04/11/2012	8310



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-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/13/2012 12:32

J1N322
 1204027-04 (Soil)

Handwritten: 4/5/2012

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Naphthalene	3.22 J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Acenaphthylene	3.39 U	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Acenaphthene	1.53 J J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Fluorene	4.75	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Phenanthrene	2.37 J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Anthracene	3.39 U	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Fluoranthene	4.41	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Indeno[1,2,3-cd]pyrene	3.39 J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Pyrene	4.92	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benz[a]anthracene	15 2.80 3.00 U	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Chrysene	2.20 J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[b]fluoranthene	1.36 J J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[k]fluoranthene	1.02 J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[a]pyrene	3.90	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Dibenz[a,h]anthracene	0.848 J J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[g,h,i]perylene	6.95 J J	3.39	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Surrogate: Triphenylene	80 %	68-129			L204079	04/09/2012	04/11/2012	8310

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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

Case Narrative

Client: WC-HANFORD RC-029 K3859
LVL #: 1204027

W.O. #: 60049-001-001-0001-00
Date Received: 04-06-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

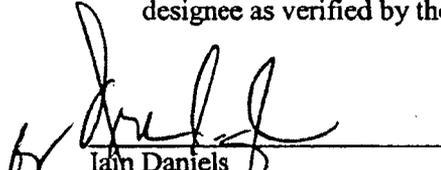
Three (3) soil samples were collected on 04-04-2012.

The samples and associated QC samples were extracted 04-09-2012 and analyzed 04-11-2012 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. Seven (7) of thirty-two (32) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC072) has been enclosed.
7. Four (4) samples required instrument dilutions due to high concentrations of target analytes. Samples J1N320, J1N321, L204079-MS2 and L204079-MSD2 required a 5-fold dilution. Reporting limits have been adjusted to reflect the necessary dilutions.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. The samples were reported on a dry weight basis.

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


Iain Daniels
LvL Laboratory Manager

4/15/12
Date

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-029-131		Page 1 of 1										
Collector STOWE	Company Contact Joan Kessner	Telephone No. 375-4688		Protect Coordinator KESSNER, JH		Price Code 8C		Data Turnaround 15 Days										
Project Destination Remaining Sites Confirmation Sampling - Soil Full Protocol		Sampling Location 300-286		SAF No. RC-025														
Ice Chest No. NA A34-12 RCC-07-015		Field Logbook No. BL-1601-06		COA C30286A000		Method of Shipment FED EX												
Shipped To 6/12/12 EDBLINE SERVICES/ LIONVILLE		Offsite Property No. A110285		Bill of Lading/Air Bill No. NA A34-12 See OSPC														
POSSIBLE SAMPLE HAZARDS/REMARKS Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly. Special Handling and/or Storage Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.				Preservation	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None								
				Type of Container	G/P	G/P	G/P	nG	nG	G/P								
				No. of Container(s)	1	1	1	1	1									
				Volume	60mL	60mL	60mL	120mL	120mL									
				See Item (1) in Special Instructions.	Chromium Hex - 7196	(Soil) - 9045	PAHs - 8310	PCBs - 8082	RCF GBA Shipping Screen									
SAMPLE ANALYSIS																		
Sample No.	Matrix *	Sample Date	Sample Time															
J1N319	SOIL	4/4/12	0920	X														
J1N320	SOIL	4/4/12	0930	X	X		X	X										
J1N321	SOIL	4/4/12	0935	X	X		X	X										
J1N322	SOIL	4/4/12	0945	X	X		X	X										
J1N323 BH 4/4/12	SOIL																	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix * S=Soil SS=Soilment SO=Solid W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace W=Wipe L=Liquid V=Vegetation X=Other						
Relinquished By/Removed From Rwney Stowe	Date/Time 4-4-12	1530	Received By/Stored In B Hudson	Date/Time 4/4/12 1530	(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)													
Relinquished By/Removed From B Hudson	Date/Time 4/4/12 1605	1060 #1	Received By/Stored In A Freier	Date/Time 4-4-12 1605														
Relinquished By/Removed From WCH	Date/Time 4-5-12		Received By/Stored In Fed Ex	Date/Time														
Relinquished By/Removed From A Freier	Date/Time 4-5-12	1080 #1	Received By/Stored In Fed Ex	Date/Time														
Relinquished By/Removed From Fed Ex	Date/Time 4-6-12	0935	Received By/Stored In Nick Hernandez	Date/Time 4-6-12 0935														
Relinquished By/Removed From	Date/Time		Received By/Stored In	Date/Time														
Relinquished By/Removed From	Date/Time		Received By/Stored In	Date/Time														
LABORATORY SECTION	Received By											Title	Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method											Disposed By	Date/Time					

000000004

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Appendix 5
Data Validation Supporting Documentation

GENERAL ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	300-2R		DATA PACKAGE: K3859		
VALIDATOR:	ELR	LAB:	LLI	DATE: 5/20/12	
			SDG:	K3859	
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	8310
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
J10320 J10321 J10322					
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: Blank - benz(a)anthracene - range to REL + Sig U

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 DS

MS - 5 out - Fall
MSD - 5 out - Fall

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?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Results supported in the raw data? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Samples properly prepared? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Detection limits meet RDL?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed?.....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Lot check performed?.....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Check recoveries acceptable?.....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Check materials traceable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Check materials Expired?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Analytical batch QC given similar cleanup?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/Calculation Errors?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> 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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/13/2012 12:32
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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 L204079 - SW 3540C									
Blank (L204079-BLK1)				Prepared: 04/09/2012 Analyzed: 04/11/2012					
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	1.00 J	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						
<i>Surrogate: Triphenylene</i>	148		ug/kg wet	166.67		89	68-129		
LCS (L204079-BS1)				Prepared: 04/09/2012 Analyzed: 04/11/2012					
Naphthalene	177	3.33	ug/kg wet	166.67		106	0-127		40
Acenaphthylene	140	3.33	ug/kg wet	166.67		84	50-140		40
Acenaphthene	156	3.33	ug/kg wet	166.67		94	17-139		40
Fluorene	143	3.33	ug/kg wet	166.67		86	28-145		40
Phenanthrene	150	3.33	ug/kg wet	166.67		90	30-152		40
Anthracene	119	3.33	ug/kg wet	166.67		72	19-171		40
Fluoranthene	149	3.33	ug/kg wet	166.67		90	34-159		40
Indeno[1,2,3-cd]pyrene	155	3.33	ug/kg wet	166.67		93	31-156		40
Pyrene	149	3.33	ug/kg wet	166.67		90	33-152		40
Benz[a]anthracene	163	3.33	ug/kg wet	166.67		98	32-157		40
Chrysene	147	3.33	ug/kg wet	166.67		88	31-159		40
Benzo[b] fluoranthene	146	3.33	ug/kg wet	166.67		88	33-164		40
Benzo[k] fluoranthene	147	3.33	ug/kg wet	166.67		88	28-161		40
Benzo[a] pyrene	182	3.33	ug/kg wet	166.67		109	29-149		40
Dibenz[a,h]anthracene	139	3.33	ug/kg wet	166.67		83	27-153		40
Benzo[g,h,i] perylene	154	3.33	ug/kg wet	166.67		93	32-157		40
<i>Surrogate: Triphenylene</i>	152		ug/kg wet	166.67		91	68-129		



264 Welsh Pool Road
 Exton, PA 19341
 Phone: 610-280-3000
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WC-Hanford, Inc.
 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-029
 Project Number: K3859
 Project Manager: Joan Kessner

Reported:
 04/13/2012 12:32

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 L204079 - SW 3540C

Matrix Spike (L204079-MS2)	Source: 1204027-02			Prepared: 04/09/2012 Analyzed: 04/11/2012					
Naphthalene	271	D	20.0	ug/kg dry	200.42	12.7	129*	0-127	40
Acenaphthylene	181	D	20.0	ug/kg dry	200.42	6.63	87	50-140	40
Acenaphthene	65.9	D	20.0	ug/kg dry	200.42	28.9	18	17-139	40
Fluorene	181	D	20.0	ug/kg dry	200.42	29.7	76	28-145	40
Phenanthrene	203	D	20.0	ug/kg dry	200.42	39.6	82	30-152	40
Anthracene	132	D	20.0	ug/kg dry	200.42	20.1 U	66	19-171	40
Fluoranthene	249	D	20.0	ug/kg dry	200.42	60.4	94	34-159	40
Indeno[1,2,3-cd]pyrene	63.3	D	20.0	ug/kg dry	200.42	20.1 U	32	31-156	40
Pyrene	210	D	20.0	ug/kg dry	200.42	43.0	83	33-152	40
Benz[a]anthracene	190	D	20.0	ug/kg dry	200.42	25.5	82	32-157	40
Chrysene	182	D	20.0	ug/kg dry	200.42	19.3	81	31-159	40
Benzo[b]fluoranthene	85.4	D	20.0	ug/kg dry	200.42	20.1 U	43	33-164	40
Benzo[k]fluoranthene	114	D	20.0	ug/kg dry	200.42	20.1 U	57	28-161	40
Benzo[a]pyrene	211	D	20.0	ug/kg dry	200.42	42.2	84	29-149	40
Dibenz[a,h]anthracene	44.7	D	20.0	ug/kg dry	200.42	20.1 U	22*	27-153	40
Benzo[g,h,i]perylene	57.1	D	20.0	ug/kg dry	200.42	9.44	24*	32-157	40
<i>Surrogate: Triphenylene</i>	<i>179</i>			<i>ug/kg dry</i>	<i>200.42</i>		<i>89</i>	<i>68-129</i>	

Matrix Spike Dup (L204079-MSD2)	Source: 1204027-02			Prepared: 04/09/2012 Analyzed: 04/11/2012						
Naphthalene	220	D	19.7	ug/kg dry	196.90	12.7	105	0-127	20	40
Acenaphthylene	165	D	19.7	ug/kg dry	196.90	6.63	80	50-140	8	40
Acenaphthene	26.2	D	19.7	ug/kg dry	196.90	28.9	-1*	17-139	232*	40
Fluorene	179	D	19.7	ug/kg dry	196.90	29.7	76	28-145	0.05	40
Phenanthrene	200	D	19.7	ug/kg dry	196.90	39.6	82	30-152	0.2	40
Anthracene	126	D	19.7	ug/kg dry	196.90	20.1 U	64	19-171	3	40
Fluoranthene	209	D	19.7	ug/kg dry	196.90	60.4	76	34-159	22	40
Indeno[1,2,3-cd]pyrene	57.7	D	19.7	ug/kg dry	196.90	20.1 U	29*	31-156	8	40
Pyrene	195	D	19.7	ug/kg dry	196.90	43.0	77	33-152	7	40
Benz[a]anthracene	175	D	19.7	ug/kg dry	196.90	25.5	76	32-157	8	40
Chrysene	169	D	19.7	ug/kg dry	196.90	19.3	76	31-159	7	40
Benzo[b]fluoranthene	87.4	D	19.7	ug/kg dry	196.90	20.1 U	44	33-164	4	40
Benzo[k]fluoranthene	113	D	19.7	ug/kg dry	196.90	20.1 U	57	28-161	0.9	40
Benzo[a]pyrene	171	D	19.7	ug/kg dry	196.90	42.2	66	29-149	25	40
Dibenz[a,h]anthracene	45.7	D	19.7	ug/kg dry	196.90	20.1 U	23*	27-153	4	40
Benzo[g,h,i]perylene	56.5	D	19.7	ug/kg dry	196.90	9.44	24*	32-157	0.5	40
<i>Surrogate: Triphenylene</i>	<i>172</i>			<i>ug/kg dry</i>	<i>196.90</i>		<i>87</i>	<i>68-129</i>		

Date: 21 May 2012
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Remaining Sites Confirmation Sampling – Soil Full Protocol – Waste Site 300-286
Subject: Wet Chemistry - Data Package No. K3859-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3859 prepared by Lionville Laboratories 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
J1N320	4/4/12	Soil	C	See note 1
J1N321	4/4/12	Soil	C	See note 1
J1N322	4/4/12	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 3). 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 30 days for chromium VI.

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

All holding times were acceptable.

Method Blanks

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

Accuracy

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

Precision

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1N320/J1N321) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results are acceptable.

Analytical Detection Levels

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

Completeness

Data package K3859 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*.

DOE/RL-2001-48, Rev. 3, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

Appendix 1
Glossary of Data Reporting Qualifiers

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

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K3859	REVIEWER: ELR	Project: 300-286	PAGE <u>1</u> OF <u>1</u>
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



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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/20/2012 15:59
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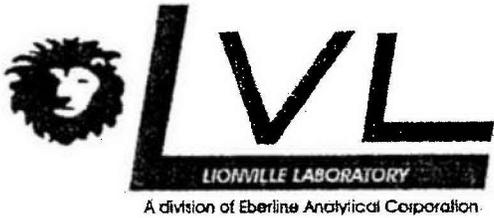
✓
5/20/12

**Wet Chemistry
 Lionville Laboratory**

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1N319 (1204027-01) Soil									
%Solids	100		0.1	% by Weight	1	L204083	04/09/2012	04/09/2012	SM2540G
J1N320 (1204027-02) Soil									
%Solids	82.7		0.1	% by Weight	1	L204083	04/09/2012	04/09/2012	SM2540G
Hexavalent Chromium	0.24 U	0.24	0.60	mg/kg dry	1	L204139	04/12/2012	04/12/2012	SW846 7196A
J1N321 (1204027-03) Soil									
%Solids	86.3		0.1	% by Weight	1	L204083	04/09/2012	04/09/2012	SM2540G
Hexavalent Chromium	0.23 U	0.23	0.58	mg/kg dry	1	L204139	04/12/2012	04/12/2012	SW846 7196A
J1N322 (1204027-04) Soil									
%Solids	94.7		0.1	% by Weight	1	L204083	04/09/2012	04/09/2012	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L204139	04/12/2012	04/12/2012	SW846 7196A

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



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

Case Narrative

Client: WC-HANFORD RC-029 K3859
LVL#: 1204027

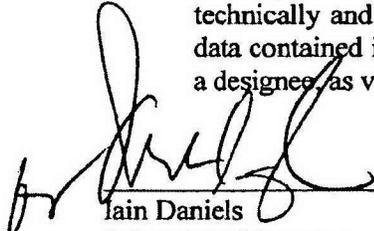
Date Received: 04-06-12

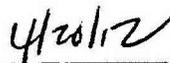
INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report

Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list 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.

3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
5. The method blank for Hexavalent Chromium (Cr^{6+}) was within the method criteria.
6. The Laboratory Control Samples (LCS) for Cr^{6+} were within the laboratory control limits.
7. The matrix spike recoveries for Cr^{6+} were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for soil samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory
njpl04-027


Date

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-029-131		Page 1 of 1					
Collector STOWE		Company Contact Joan Kessner		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8C		Data Turnaround 15 Days				
Project Designation Remaining Sites Confirmation Sampling - Soil Fall Protocol		Sampling Location 300-286		SAF No. RC-029		Method of Shipment FED EX								
Ice Chest No. NA A944-12 RCC-07-015		Field Logbook No. EL-1601-06		COA C30286A000		Bill of Lading/Air Bill No. NA A9 44-12				SEC OSPC				
Shipped To 64123/L EDERLINE SERVICES/LIONVILLE		Offsite Property No. A110285												
POSSIBLE SAMPLE HAZARDS/REMARKS Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly. Special Handling and/or Storage Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.				Preservation		Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	None			
				Type of Container		G/P	G/P	G/P	wG	wG	G/P			
				No. of Container(s)		1	1	1	1	1				
				Volume		60mL	60mL	60mL	120mL	120mL				
SAMPLE ANALYSIS				See Item (1) in Special Instructions.		Chromium Hex - 7196	(Soil) - 9045	PAHs - 8310	PCBs - 8082	RCF GBA Shipping Screen				
				Sample No.	Matrix *	Sample Date	Sample Time							
J1N319	SOIL	4/4/12	0920	X										
J1N320	SOIL	4/4/12	0930	X	X		X	X						
J1N321	SOIL	4/4/12	0935	X	X		X	X						
J1N322	SOIL	4/4/12	0945	X	X		X	X						
J1N325 BH	SOIL	4/4/12												
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS						
Relinquished By/Removed From Quincy Stowe		Date/Time 4-4-12 1530		Received By/Stored In BHUDSON BHADEN		Date/Time 4/4/12 1530		(1) ICP Metals - 6010TR (Close-out L1a) (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) Matrix * S=Soil SS=Soil/Sludge SO=Soil SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace W/V=Wipe L=Liquid V=Vegetation X=Other						
Relinquished By/Removed From BHUDSON BHADEN		Date/Time 4/4/12 1605		Received By/Stored In A. Fricer A. J. J. J.		Date/Time 4-4-12 1605								
Relinquished By/Removed From WCH		Date/Time 4-5-12		Received By/Stored In Fed Ex		Date/Time								
Relinquished By/Removed From A. Fricer A. J. J. J.		Date/Time 10/08/13 1330		Received By/Stored In WCH		Date/Time								
Relinquished By/Removed From Fed Ex		Date/Time 4-6-12 0935		Received By/Stored In VICTOR HERNANDEZ		Date/Time 4-6-12 0935								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By		Title				Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time						



0000000004

12

Appendix 5
Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	300-286		DATA PACKAGE: K3859		
VALIDATOR:	FLR	LAB:	LLI	DATE: 5/20/12	
			SDG: K3859		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J1N320 J1N321 J1N322					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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

Initial calibrations acceptable? Yes No N/A

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

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

Standards traceable? Yes No N/A

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

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

- ICB and CCB checks performed for all applicable analyses? (Levels D, E)..... Yes No N/A
- ICB and CCB results acceptable? (Levels D, E) Yes No N/A
- Laboratory blanks analyzed? Yes No N/A
- Laboratory blank results acceptable?..... Yes No N/A
- Field blanks analyzed? (Levels C, D, E) Yes No N/A
- Field blank results acceptable? (Levels C, D, E) Yes No N/A
- Transcription/calculation errors? (Levels D, E)..... Yes No N/A

Comments: _____

_____ *no FB*

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

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

Comments: _____ *no FB*

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Results supported in the raw data? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Samples properly prepared? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Detection limits meet RDL?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> 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-029 Project Number: K3859 Project Manager: Joan Kessner	Reported: 04/20/2012 15:59
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**Wet Chemistry - Quality Control
Lionville Laboratory**

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204083 - % Solids										
Duplicate (L204083-DUP2) Source: 1204027-02 Prepared & Analyzed: 04/09/2012										
%Solids	83.1		0.1	% by Weight		82.7			0.5	20
Batch L204139 - Default Prep GenChem										
Blank (L204139-BLK1) Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	0.20 U	0.20	0.50	mg/kg wet						
LCS (L204139-BS1) Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	3.52	0.20	0.50	mg/kg wet	4.0000		88	80-120		
LCS (L204139-BS2) Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	973 D	20.0	50.0	mg/kg wet	1152.8		84	80-120		
Duplicate (L204139-DUP1) Source: 1204027-04 Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry		0.21 U				20
Matrix Spike (L204139-MS1) Source: 1204027-04 Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	3.21	0.21	0.53	mg/kg dry	4.2260	0.21 U	76	75-125		
Matrix Spike (L204139-MS2) Source: 1204027-04 Prepared & Analyzed: 04/12/2012										
Hexavalent Chromium	1100 D	21.1	52.8	mg/kg dry	1251.9	0.21 U	88	75-125		