0100032

SAF-RC-214
Characterization of Hanford Site Coal Ash Components - Other
FINAL VALIDATION PACKAGE

COMPLETE COPY OF FINAL VALIDATION PACKAGE TO:

Kathy Wendt	H4-21	KW 10/26/11 INITIAL/DATE

COMMENTS:

SDG K3632 SAF-RC-214

Sample Location: 126-H-1

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Date: 13 October 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 126-H-1
Subject: Inorganics - Data Package No. K3632-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3632 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
J1HJ63	8/27/11	Other	C	See note 1
J1HJ64	8/27/11	Other	C	See note 1
J1HJ65	8/27/11	Other	C	See note 1
J1HJ66	8/27/11	Other	C	See note 1
J1HJ67	8/24/11	Other	C	See note 1
J1HJ72	8/24/11	Other	C	See note 1
J1HJ73	8/28/11	Other	C	See note 1
J1HJ74	8/27/11	Other	C	See note 1
J1HJ75	8/27/11	Other	C	See note 1
J1HJ76	8/28/11	Other	C	See note 1
J1HJ77	8/24/11	Other	C	See note 1
J1HJ78	8/27/11	Other	C	See note 1
J1HJ79	8/24/11	Other	C	See note 1
J1HJ80	8/24/11	Other	C	See note 1
J1HJ81	8/24/11	Other	C	See note 1
J1HJ82	8/27/11	Other	C	See note 1

1 – ICP metals by 6010B & mercury by 7471A.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011 (DOE/RL-2010-113, Rev. 0). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "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.

Due to method blank contamination, the zinc results in sample J1HJ79 was qualified as undetected and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field (equipment) blank (J1JH79) was submitted for analysis. Seven analytes were detected in the equipment 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 (32%), lead (63.5%), manganese (51.1%), nickel (65.3%) and thallium (62.6%) results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (212%), all detected boron results were qualified as estimates and flagged "J".

Due to the lack of an LCS analysis, all uranium 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 (J1HJ72/J1HJ77) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for boron (162%), chromium (53%) and zinc (38%) were outside QC limits.

Under the WCH statement of work, no qualification is required. All other analytes met the RQL.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K3632 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 zinc results in sample J1JH79 was qualified as undetected and flagged "UJ".
- Due to matrix spike recoveries outside QC limits, all antimony (32%), lead (63.5%), manganese (51.1%), nickel (65.3%) and thallium (62.6%) results were qualified as estimates and flagged "J".
- Due to a matrix spike recovery outside QC limits (212%), all detected boron results were qualified as estimates and flagged "J".
- Due to the lack of an LCS analysis, all uranium 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-2010-113, Rev. 0, *Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011*, U.S. Department of Energy, February 2011.

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

INORGANIC DATA QUALIFICATION SUMMARY*

SDG: K3632	**REVIEWER: ELR**	**Project: 300 Area Ash Depth**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Zinc	UJ	J1HJ79	Method blank contamination
Antimony lead manganese nickel thallium	J	All	Matrix spike recovery
Boron	J	All (except J1HJ79)	Matrix spike recovery
Uranium	J	All	No LCS

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

Appendix 3

Annotated Laboratory Reports

LIONVILLE LABORATORY
A division of Quantum Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ63
1109013-01 (Other Solid) V 10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.526	U J	0.526	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	**3.46**		0.877	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	**783**		0.439	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	**0.842**		0.175	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	**46.7**	J	1.75	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	**0.180**		0.175	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	**9.38**		0.175	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	**7.98**		1.75	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	**42.1**		0.877	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	**2.46**	J	0.439	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	**134**	J	4.39	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	**1.51**	B	1.75	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	**20.4**	J	3.51	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.263	U	0.263	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.175	U	0.175	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.439	U J	0.439	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	17.5	U J	17.5	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	**50.6**		2.19	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	**16.3**		8.77	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	**0.0153**	B	0.0290	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ64
1109013-02 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.492	U J	0.492	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	2.51		0.820	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	527		0.410	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	0.833		0.164	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	145	J	1.64	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.148	B	0.164	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	8.57		0.164	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	2.14		1.64	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	16.7		0.820	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	4.40	J	0.410	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	67.7	J	4.10	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	0.708	B	1.64	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	5.88	J	3.28	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.762		0.246	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.164	U	0.164	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.410	U J	0.410	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	16.4	U J	16.4	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	23.8		2.05	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	14.1		8.20	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0488		0.0281	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ65
1109013-03 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.545	U J	0.545	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	3.34		0.909	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	506		0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.00		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	150	J	1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.212		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	10.9		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	2.53		1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	20.6		0.909	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	6.99	J	0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	81.8	J	4.55	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	0.786	B	1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	7.05	J	3.64	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	1.49		0.273	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.182	U	0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.455	U J	0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	18.2	U J	18.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	26.6		2.27	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	22.5		9.09	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.129		0.0273	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ66
1109013-04 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.566	U J	0.566	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	3.90		0.943	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	760		0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	0.941		0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	41.5	J	1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.176	B	0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	10.6		0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	9.01		1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	46.8		0.943	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	1.96	J	0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	154	J	4.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	2.11		1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	22.4	J	3.77	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.283	U	0.283	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.189	U	0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.472	U J	0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	18.9	U J	18.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	58.4		2.36	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	17.2		9.43	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0250	U	0.0250	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ67
1109013-05 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.508	U J	0.508	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	2.94		0.847	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	916		0.424	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.31		0.169	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	455	J	1.69	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.178		0.169	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	16.5		0.169	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	3.77		1.69	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	33.8		0.847	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	4.25	J	0.424	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	122	J	4.24	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	2.44		1.69	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	10.9	J	3.39	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.341		0.254	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.169	U	0.169	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.424	U J	0.424	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	16.9	U J	16.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	42.2		2.12	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	20.1		8.47	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0184	B	0.0265	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ72
1109013-06 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.476	U J	0.476	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	**2.55**		0.794	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	**954**		0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	**1.05**		0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	**235**	J	1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	**0.217**		0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	**12.3**		0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	**3.66**		1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	**24.0**		0.794	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	**5.02**	J	0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	**153**	J	3.97	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	**1.44**	B	1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	**10.1**	J	3.17	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	**0.338**		0.238	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.159	U	0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.397	U J	0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	15.9	U J	15.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	**33.8**		1.98	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	**28.9**		7.94	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	**0.0271**		0.0257	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ73
1109013-07 (Other Solid) V 10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.517	U J	0.517	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	3.78		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	846		0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	0.830		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	102	J	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.244		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	14.1		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	8.25		1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	30.7		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	5.82	J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	283	J	4.31	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.25	B	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	15.6	J	3.45	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.259	U	0.259	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.172	U	0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.431	U J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	17.2	U J	17.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	52.6		2.16	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	48.6		8.62	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0718		0.0243	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ76
1109013-08 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.517	U J	0.517	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	3.60		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	1330		0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.44		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	243	J	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.347		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	10.7		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	9.94		1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	31.7		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	4.77	J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	300	J	4.31	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	2.05		1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	17.8	J	3.45	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.349		0.259	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.172	U	0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.431	U J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	17.2	U J	17.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	44.5		2.16	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	47.9		8.62	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0747		0.0281	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ74
1109013-09 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.476	U J	0.476	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	2.28		0.794	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	816		0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	0.654		0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	24.0	J	1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.159	B	0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	7.39		0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	6.80		1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	35.4		0.794	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	2.50	J	0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	78.8	J	3.97	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.40	B	1.59	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	17.8	J	3.17	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.238	U	0.238	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.159	U	0.159	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.397	U J	0.397	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	15.9	U J	15.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	42.6		1.98	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	13.9		7.94	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0113	B	0.0257	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ75
1109013-10 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.556	U J	0.556	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	3.70		0.926	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	1020		0.463	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.04		0.185	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	84.5	J	1.85	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.233		0.185	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	11.5		0.185	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	7.72		1.85	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	42.4		0.926	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	4.26	J	0.463	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	141	J	4.63	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.81	B	1.85	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	19.2	J	3.70	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.510		0.278	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.185	U	0.185	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.463	U J	0.463	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	18.5	U J	18.5	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	54.4		2.31	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	24.6		9.26	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0510		0.0250	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ77
1109013-11 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.517	U J	0.517	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	2.82		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	1080		0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.11		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	253	J	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.183		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	12.5		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	3.82		1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	23.7		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	5.21	J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	122	J	4.31	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.49	B	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	10.2	J	3.45	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.504		0.259	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.172	U	0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.431	U J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	17.2	U J	17.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	33.3		2.16	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	19.5		8.62	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0191	B	0.0265	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ78
1109013-12 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	**0.296**	B J	0.577	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	**3.01**		0.962	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	**773**		0.481	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	**0.901**		0.192	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	**52.5**	J	1.92	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	**0.176**	B	0.192	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	**9.75**		0.192	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	**8.83**		1.92	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	**44.9**		0.962	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	**2.32**	J	0.481	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	**135**	J	4.81	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	**1.78**	B	1.92	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	**20.4**	J	3.85	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.288	U	0.288	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.192	U	0.192	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.481	U J	0.481	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	19.2	U J	19.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	**52.1**		2.40	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	**15.2**		9.62	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	**0.0291**		0.0281	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ79
1109013-13 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.417	U J	0.417	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	1.55		0.694	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	2.33		0.347	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	0.0844	B	0.139	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	1.39	U	1.39	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.139	U	0.139	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	0.427		0.139	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	1.39	U	1.39	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	0.694	U	0.694	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	1.12	J	0.347	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	7.47	J	3.47	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.39	U	1.39	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	2.78	U J	2.78	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.208	U	0.208	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.139	U	0.139	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.347	U J	0.347	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	13.9	U J	13.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	1.01	B	1.74	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	4.53	B UJ	6.94	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0237	U	0.0237	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ80
1109013-14 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.517	U J	0.517	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	11.7		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	1000		0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	1.28		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	404	J	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	0.200		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	11.2		0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	2.42		1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	22.7		0.862	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	132	J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	90.9	J	4.31	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	1.41	B	1.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	6.96	J	3.45	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.259	U	0.259	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.172	U	0.172	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.431	U J	0.431	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	17.2	U J	17.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	27.0		2.16	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	31.3		8.62	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	0.0352		0.0273	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ81
1109013-15 (Other Solid)

10/12/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.545	U J	0.545	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	**2.24**		0.909	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	**709**		0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	**0.691**		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	**199**	J	1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	**0.184**		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	**9.62**		0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	**3.52**		1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	**25.3**		0.909	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	**18.3**	J	0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	**148**	J	4.55	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	**1.96**		1.82	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	**10.6**	J	3.64	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	0.273	U	0.273	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.182	U	0.182	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.455	U J	0.455	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	18.2	U J	18.2	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	**28.9**		2.27	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	**21.0**		9.09	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	**0.863**		0.0231	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

LIONVILLE LABORATORY
A Division of Fleetline Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

J1HJ82
1109013-16 (Other Solid)

10/12/11

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Antimony	0.566	U J	0.566	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Arsenic	**2.79**		0.943	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Barium	**487**		0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Beryllium	**1.15**		0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Boron	**245**	J	1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cadmium	**0.252**		0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Chromium	**8.52**		0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Cobalt	**1.72**	B	1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Copper	**18.1**		0.943	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Lead	**27.3**	J	0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Manganese	**82.1**	J	4.72	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Molybdenum	**0.916**	B	1.89	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Nickel	**4.79**	J	3.77	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Selenium	**1.18**		0.283	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Silver	0.189	U	0.189	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Thallium	0.472	U J	0.472	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Uranium	18.9	U J	18.9	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Vanadium	**19.6**		2.36	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Zinc	**25.7**		9.43	mg/kg wet	1	L109104	09/08/2011	09/11/2011	6010B
Mercury	**0.0530**		0.0281	mg/kg wet	1	L109137	09/12/2011	09/14/2011	7471A

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-214
LVL#: 1109013
SDG/SAF#: K3632/RC-214

W.O.#: 60049-001-001-0001-00
Date Received: 09-01-11

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 16 other solid samples.

2. The sample was prepared and analyzed in accordance with methods listed on the data report forms. The samples were reported on a wet weight, 'as-received' basis.

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

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

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, samples 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. There is no Uranium result for reference sample L109104-SRM1 due to the standard reference material does not contain Uranium. The soil samples were reported for Uranium as per the project manager.

10. The matrix spike (MS) recoveries for 17 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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 40 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1HJ63	Antimony	100	94.6
	Arsenic	100	104.5
	Barium	1,100	90.7
	Boron	1,100	82.1
	Chromium	100	104.1
	Cobalt	100	100.1
	Copper	100	96.9
	Lead	100	90.0
	Manganese	1,000	70.3
	Molybdenum	100	100.0
	Nickel	100	95.2
	Selenium	100	106.8
	Silver	100	89.1
	Thallium	100	88.8
	Uranium	1,000	79.8
	Zinc	1,100	88.7
	Mercury	1.0	112.0

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Mercury was less 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

9/16/4
Date

alm/09-013hgn%

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1

Collector: Sparks	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE		SAF No.: RC-214
Ice Chest No.: GWS-172	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: 3055		Bill of Lading/Air Bill No.: 7951 3915 4737 ~~See OSPC~~ DW 8/31/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time										
16	J1HJ63	OTHER	8-27-11	0940	X									
17	J1HJ64	OTHER	8-27-11	0915	X	X	X							
18	J1HJ65	OTHER	8-27-11	1112	X									
19	J1HJ66	OTHER	8-27-11	1105	X									
20	J1HJ67	OTHER												

030

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Sparks	8-27-11 1500	SSU#1	8-27-11 1500
Relinquished By/Removed From: SSU-1	AUG 31 2011 1000	Received By/Stored In: L.D. Wall	AUG 31 2011 1000
Relinquished By/Removed From: L.D. Wall	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: Victor Hernandez	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY [illegible] DATE 82711

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

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

WCH-EE-011

0000000029

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1
Collector: C. Fulton	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE	SAF No.: RC-214	
Ice Chest No.: GWS-16	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4601 ~~See OSPC~~	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	0mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time										
16	J1HJ63	OTHER												
17	J1HJ64	OTHER												
18	J1HJ65	OTHER												
19	J1HJ66	OTHER												
C20	J1HJ67	OTHER	8/24/11	1110	✓	✓	✓							

C31

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	SSU#1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: L.D. Wall	AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wall OHPRO	AUG 31 2011 1400	Received By/Stored In: OHPRO FEDEX	
Relinquished By/Removed From: Fed Ex	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 8 24 11

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

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

WCH-EE-011

000000030

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-41	Page 1 of 1
Collector C. FULTON	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C / Data Turnaround 15 Days
Project Designation Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location 126-H-1 SURFACE	SAF No. RC-214	
Ice Chest No. GWS-172	Field Logbook No. EL-1658 / COA BESCAS6000	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES / KIONVILLE	Offsite Property No. 3055	Bill of Lading/Air Bill No. 7951 3915 4737 ~~See OSPC~~	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

			Preservation	None	Cool 4C	None	None					
			Type of Container	G/P	aG	P	G/P					
			No. of Container(s)	1	1	2	1					
			Volume	250mL	250mL	1000mL	10mL					
SAMPLE ANALYSIS				See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium					
Sample No.	Matrix *	Sample Date	Sample Time									
21 J1HJ68	OTHER											
22 J1HJ69	OTHER											
23 J1HJ70	OTHER											
24 J1HJ71	OTHER											
25 J1HJ72	OTHER	8/24/11	0955	✓	✓	✓						

032

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	SSU #1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 31 2011 1000	Received By/Stored In: L.D. Wall CHPRC	AUG 31 2011 1000
Relinquished By/Removed From: L.D. Wall CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: HECTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 8 24 11

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

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

WCH-EE-011

000000031

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-42	Page 1 of 1
Collector	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE	SAF No.: RC-214	
Ice Chest No.: GWS-216	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / KIONVILLE	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4689 ~~See OSPC~~ DLW 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time									
26	J1HJ73	OTHER	8-28-11	0929	X								
27	J1HJ74	OTHER											
28	J1HJ75	OTHER											
29	J1HJ76	OTHER	8-28-11	0932	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: [signature]	8-28-11	Received By/Stored In: [signature]	8-28-11
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: L.D. Wall CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: [signature]	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS
Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc]; Mercury - 7471 - (CV) [Mercury]

REVIEWED BY [signature] DATE 8/25/11

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

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

WCH-EE-011

033

000000032

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-42	Page 1 of 1
Collector: Spooker	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE	SAF No.: RC-214	
Ice Chest No.: GWS-216	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4689; See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None	08/31/11						
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time										
26	J1HJ73	OTHER												
27	J1HJ74	OTHER	8-27-11	1050	X									
28	J1HJ75	OTHER	8-27-11	1055	X									
29	J1HJ76	OTHER												

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Spooker	8-27-11 1500	SSU#1	8-27-11 1500
Relinquished By/Removed From	SSU-1	AUG 31 2011 0800	L.D. Well CHPRC	AUG 31 2011 0800
Relinquished By/Removed From	L.D. Well CHPRC	AUG 31 2011 1400	FEDEX	
Relinquished By/Removed From	FedEx	9-1-11 1000	VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 82711

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

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

WCH-EE-011

034

000000033

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-43	Page 1 of 1
Collector: C. Fulton	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DUPLICATE	SAF No.: RC-214	
Ice Chest No.: GWS-216	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: ~~See USPC~~ 7951 3915 4689	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Lignum							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ77	OTHER	8/24/11	0950	✓	✓								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	SSU #1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY
DATE 8/24/11

Matrix *

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

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

WCH-EE-011

035

000000034

11

1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-44	Page 1 of 1

Collector: Sparks	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DUPLICATE		SAF No.: RC-214
Ice Chest No.: GWS-216	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3055		Bill of Lading/Air Bill No.: 7951 3915 4689

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ78	OTHER	8-27-11	0940	X									

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Sparks	8-27-11 1500	Received By/Stored In: Sparks	8-27-11 1500
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: L.D. Wells CEPBC	AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wells CEPBC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1600
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS
Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DATE 8 27 11

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

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

WCH-EE-011

036

000000035

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-45	Page 1 of 1
Collector C. Fulton	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C / Data Turnaround 15 Days
Project Designation Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location 126-H-1 EQUIPMENT BLANK	SAF No. RC-214	
Ice Chest No. GWS-216	Field Logbook No. EL-1658 / COA BESCAS6000	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. 3055	Bill of Lading/Air Bill No. 7951 3915 4689 ~~See OSPC~~ DW 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

N/A

Preservation	None	Cool 4C									
Type of Container	G/P	aG									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270									

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ79	OTHER	8/24/11	1044	X	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1100	SSU#1	8/24/11 1100
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY SPB DATE 8/24/11

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

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

WCH-EE-011

000000036

037

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-46	Page 1 of 1
Collector C. FULTON	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C / Data Turnaround 15 Days
Project Designation Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location 126-H-1 DEPTH	SAF No. RC-214	
Ice Chest No. GWS-16	Field Logbook No. EL-1658 / COA BESCAS6000	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. 3055	Bill of Lading/Air Bill No. ~~See OSPC~~ 7951 3915 4601	

000000037

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No. / Matrix * / Sample Date / Sample Time											
J1HJ80 / OTHER / 8/24/11 / 0955	✓	✓	✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
C. FULTON	8/24/11 1200	SSU#1	8/24/11 1200
SSU-1	AUG 31 2011 0900	L.D. Wall CHPRC	AUG 31 2011 0900
L.D. Wall CHPRC	AUG 31 2011 1400	FEDEX	
FedEx	9-1-11 1000	HECTOR HERNANDEZ	9-1-11 1000

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Manual)

REVIEWED BY DATE 8/24/11

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

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

WCH-EE-011

038

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-47	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH		SAF No.: RC-214
Ice Chest No.: GWS-16	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3055		Bill of Lading/Air Bill No.: 7951 3915 4601 ~~See OSPC~~

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ81	OTHER	8/24/11	~~1110~~ 1115	✓	✓	✓							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C Fulton	Date/Time: 8/24/11 1200	Received By/Stored In: SSU #1	Date/Time: 8/24/11 1201
Relinquished By/Removed From: SSU- 1	Date/Time: AUG 31 2011 0800	Received By/Stored In: L.D. Wall	Date/Time: AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wall	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 9-1-11 1000
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DJ DATE 9/2/11

Matrix *

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

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

WCH-EE-011

000000038

039

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-214-48	Page 1 of 1
Collector: Spades	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C — Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH Sample point 17		SAF No.: RC-214	
Ice Chest No.: GW5-172	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3055		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7951 3915 4737	

POSSIBLE SAMPLE ~~HAZARDS~~/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None	DLD 8/31/11						
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No. / Matrix * / Sample Date / Sample Time											
J1HJ82 / OTHER / 8-22-11 / 0920	X	X	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Spades	Date/Time: 8-22-11 1500	Received By/Stored In: SSUTTL	Date/Time: 8-22-11 1500
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 1000	Received By/Stored In: L.D. Wall CHPRC	Date/Time: AUG 31 2011 1000
Relinquished By/Removed From: L.D. Wall CHPRC	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 9-1-11 1000
Relinquished By/Removed From	Date/Time:	Received By/Stored In	Date/Time:
Relinquished By/Removed From	Date/Time:	Received By/Stored In	Date/Time:

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY

DATE 5-27-11

Matrix *

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

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

WCH-EE-011

000000039

040

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 300 Area Ash Depth			DATA PACKAGE: K3632		
VALIDATOR: ELR		LAB: LLI		DATE: 10/11/11	
			SDG: K3632		

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

SAMPLES/MATRIX				
J1HJ63	J1HJ64	J1HJ65	J1HJ66	J1HJ67
J1HJ72	J1HJ73	J1HJ74	J1HJ74	J1HJ75
J1HJ77	J1HJ78	J1HJ79	J1HJ80	J1HJ81
J1HJ82				
				other

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: zinc - UJ 79

FB - 7 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 (32%) ~~barium~~ lead (63.5%) manganese (51%), J all
boron - (212) - J detects nickel (65%) thallium (62.2%)

LCS - no uranium - J all

MS - Hg - 131% - J all detects

no BAS

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:

FD- boron (162%) chromium (53%) zinc (39%)

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-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

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 L109104 - SW 3050B										
Blank (L109104-BLK1)				Prepared: 09/08/2011 Analyzed: 09/11/2011						
Antimony	0.492	U	0.492	mg/kg wet						
Arsenic	0.820	U	0.820	mg/kg wet						
Barium	0.410	U	0.410	mg/kg wet						
Beryllium	0.164	U	0.164	mg/kg wet						
Boron	1.64	U	1.64	mg/kg wet						
Cadmium	0.164	U	0.164	mg/kg wet						
Chromium	0.164	U	0.164	mg/kg wet						
Cobalt	1.64	U	1.64	mg/kg wet						
Copper	0.820	U	0.820	mg/kg wet						
Lead	0.410	U	0.410	mg/kg wet						
Manganese	4.10	U	4.10	mg/kg wet						
Molybdenum	1.64	U	1.64	mg/kg wet						
Nickel	3.28	U	3.28	mg/kg wet						
Selenium	0.246	U	0.246	mg/kg wet						
Silver	0.164	U	0.164	mg/kg wet						
Thallium	0.410	U	0.410	mg/kg wet						
Uranium	16.4	U	16.4	mg/kg wet						
Vanadium	2.05	U	2.05	mg/kg wet						
Zinc	1.33	B	8.20	mg/kg wet						
Duplicate (L109104-DUP1)		Source: 1109013-01		Prepared: 09/08/2011 Analyzed: 09/11/2011						
Antimony	0.526	U	0.526	mg/kg wet		0.526 U				20
Arsenic	2.89		0.877	mg/kg wet		3.46			17.7	20
Barium	728		0.439	mg/kg wet		783			7.34	20
Beryllium	0.775		0.175	mg/kg wet		0.842			8.33	20
Boron	48.4		1.75	mg/kg wet		46.7			3.54	20
Cadmium	0.174	B	0.175	mg/kg wet		0.180			3.18	20
Chromium	8.79		0.175	mg/kg wet		9.38			6.47	20
Cobalt	7.47		1.75	mg/kg wet		7.98			6.69	20
Copper	44.8		0.877	mg/kg wet		42.1			6.05	20
Lead	2.13		0.439	mg/kg wet		2.46			14.3	20
Manganese	124		4.39	mg/kg wet		134			8.22	20
Molybdenum	1.51	B	1.75	mg/kg wet		1.51			0.00	20
Nickel	18.3		3.51	mg/kg wet		20.4			10.6	20
Selenium	0.263	U	0.263	mg/kg wet		0.263 U				20
Silver	0.175	U	0.175	mg/kg wet		0.175 U				20
Thallium	0.439	U	0.439	mg/kg wet		0.439 U				20

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-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/15/2011 11:24

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 L109104 - SW 3050B										
Duplicate (L109104-DUP1)		**Source: 1109013-01**		**Prepared: 09/08/2011 Analyzed: 09/11/2011**						
Uranium	17.5	U	17.5	mg/kg wet		17.5 U				20
Vanadium	46.6		2.19	mg/kg wet		50.6			8.08	20
Zinc	15.2		8.77	mg/kg wet		16.3			6.84	20
Matrix Spike (L109104-MS1)		**Source: 1109013-01**		**Prepared: 09/08/2011 Analyzed: 09/11/2011**						
Antimony	11.5		0.429	mg/kg wet	35.714	0.526 U	32.3*	75-125		20
Arsenic	108		0.714	mg/kg wet	142.86	3.46	73.3*	75-125		20
Barium	1290		0.357	mg/kg wet	142.86	783	354*	75-125		20
Beryllium	3.65		0.143	mg/kg wet	3.5714	0.842	78.7	75-125		20
Boron	198		1.43	mg/kg wet	71.429	46.7	212*	75-125		20
Cadmium	2.96		0.143	mg/kg wet	3.5714	0.180	77.8	75-125		20
Chromium	19.4		0.143	mg/kg wet	14.286	9.38	70.1*	75-125		20
Cobalt	33.2		1.43	mg/kg wet	35.714	7.98	70.5*	75-125		20
Copper	54.6		0.714	mg/kg wet	17.857	42.1	70.0*	75-125		20
Lead	25.2		0.357	mg/kg wet	35.714	2.46	63.5*	75-125		20
Manganese	153		3.57	mg/kg wet	35.714	134	51.1*	75-125		20
Molybdenum	53.8		1.43	mg/kg wet	71.429	1.51	73.2*	75-125		20
Nickel	43.7		2.86	mg/kg wet	35.714	20.4	65.3*	75-125		20
Selenium	100		0.214	mg/kg wet	142.86	0.263 U	70.2*	75-125		20
Silver	2.56		0.143	mg/kg wet	3.5714	0.175 U	71.7*	75-125		20
Thallium	89.4		0.357	mg/kg wet	142.86	0.439 U	62.6*	75-125		20
Uranium	257		14.3	mg/kg wet	357.14	17.5 U	72.1*	75-125		20
Vanadium	77.8		1.79	mg/kg wet	35.714	50.6	76.2	75-125		20
Zinc	42.0		7.14	mg/kg wet	35.714	16.3	72.0*	75-125		20
Reference (L109104-SRM1)				**Prepared: 09/08/2011 Analyzed: 09/11/2011**						
Antimony	48.8		1.27	mg/kg wet	53.000		92.2	0-235.8		
Arsenic	115		2.11	mg/kg wet	114.00		101	82.8-117.54		
Barium	321		1.06	mg/kg wet	307.00		105	79.8-120.2		
Beryllium	109		0.423	mg/kg wet	108.00		101	82.8-117.6		
Boron	78.0		4.23	mg/kg wet	85.100		91.7	67.5-132.8		
Cadmium	233		0.423	mg/kg wet	225.00		104	83.6-116.4		
Chromium	85.1		0.423	mg/kg wet	77.200		110	73.3-126.4		
Cobalt	168		4.23	mg/kg wet	166.00		101	80.7-118.7		
Copper	266		2.11	mg/kg wet	271.00		98.3	80.8-119.2		
Lead	187		1.06	mg/kg wet	190.00		98.5	81.6-118.4		
Manganese	1080		10.6	mg/kg wet	965.00		112	69.3-130.5		
Molybdenum	243		4.23	mg/kg wet	235.00		103	76.2-123.8		

LIONVILLE LABORATORY
A division of Fiberline Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/15/2011 11:24

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 L109104 - SW 3050B										
Reference (L109104-SRM1)				Prepared: 09/08/2011 Analyzed: 09/11/2011						
Nickel	223		8.45	mg/kg wet	221.00		101	79.6-120.8		
Selenium	190		0.634	mg/kg wet	187.00		102	75.9-124.6		
Silver	81.7		0.423	mg/kg wet	83.500		97.9	82.7-117.1		
Thallium	84.1		1.06	mg/kg wet	86.800		96.8	77.3-122.1		
Vanadium	105		5.28	mg/kg wet	98.700		107	75.9-123.6		
Zinc	201		21.1	mg/kg wet	199.00		101	78.4-121.6		
Batch L109137 - SW 7471A Prep										
Blank (L109137-BLK1)				Prepared: 09/12/2011 Analyzed: 09/14/2011						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L109137-DUP1)		Source: 1109013-01		Prepared: 09/12/2011 Analyzed: 09/14/2011						
Mercury	0.0190	B	0.0265	mg/kg wet		0.0153			21.3*	20
Matrix Spike (L109137-MS1)		Source: 1109013-01		Prepared: 09/12/2011 Analyzed: 09/14/2011						
Mercury	0.207		0.0265	mg/kg wet	0.14706	0.0153	131*	75-125		
Reference (L109137-SRM1)				Prepared: 09/12/2011 Analyzed: 09/14/2011						
Mercury	1.30		0.0290	mg/kg wet	1.2900		101	62.6-138		

Date: 13 October 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 126-H-1
Subject: Radiochemistry - Data Package No. K3632-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3632 prepared by Eberline Services (EB). 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
J1HJ64	8/27/11	Other	C	See note 1
J1HJ67	8/24/11	Other	C	See note 1
J1HJ72	8/24/11	Other	C	See note 1
J1HJ77	8/24/11	Other	C	See note 1
J1HJ80	8/24/11	Other	C	See note 1
J1HJ81	8/24/11	Other	C	See note 1
J1HJ82	8/27/11	Other	C	See note 1

1 – Total uranium.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011 (DOE/RL-2010-113, Rev. 0). 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 PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J1JH72/J1HJ77) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K3632 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-2010-113, Rev. 0, *Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011*, U.S. Department of Energy, February 2011.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K3632	REVIEWER: ELR	Project: 300 Area Ash Depth	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-001 J1HJ64

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG K3632	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109013-01	Client sample id	J1HJ64		
Dept sample id	7784-001	Location/Matrix	126-H-1 SURFACE	SOLID	
Received	09/01/11	Collected/Weight	08/27/11 09:15	25.52 g	
% solids	100.0	Custody/SAF No	RC-214-40	RC-214	

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	2.24	0.25	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-002 J1HJ67

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG K3632
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S109013-02	Client sample id	J1HJ67	
Dept sample id	7784-002	Location/Matrix	126-H-1 SURFACE	SOLID
Received	09/01/11	Collected/Weight	08/24/11 11:10	50.68 g
% solids	100.0	Custody/SAF No	RC-214-40	RC-214

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	4.01	0.49	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

✓ 10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-003 J1HJ72

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG_K3632	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109013-03	Client sample id	J1HJ72		
Dept sample id	7784-003	Location/Matrix	126-H-1 SURFACE	SOLID	
Received	09/01/11	Collected/Weight	08/24/11 09:50	53.41 g	
% solids	100.0	Custody/SAF No	RC-214-41	RC-214	

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	3.06	0.37	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-004 J1HJ77

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG_K3632
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S109013-04	Client sample id	J1HJ77	
Dept sample id	7784-004	Location/Matrix	126-H-1 DUPLICATE	SOLID
Received	09/01/11	Collected/Weight	08/24/11 09:50	50.70 g
% solids	100.0	Custody/SAF No	RC-214-43	RC-214

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	2.91	0.36	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

V 10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-005 J1HJ80

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG K3632
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S109013-05	Client sample id	J1HJ80	
Dept sample id	7784-005	Location/Matrix	126-H-1 DEPTH	SOLID
Received	09/01/11	Collected/Weight	08/24/11 09:55	55.16 g
% solids	100.0	Custody/SAF No	RC-214-46	RC-214

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	4.25	0.51	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-006 J1HJ81

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG K3632
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S109013-06	Client sample id	J1HJ81	
Dept sample id	7784-006	Location/Matrix	126-H-1 DEPTH	SOLID
Received	09/01/11	Collected/Weight	08/24/11 11:15	61.13 g
% solids	100.0	Custody/SAF No	RC-214-47	RC-214

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	2.78	0.34	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-007 J1HJ82

DATA SHEET

SDG	7784	Client/Case no	Hanford	SDG K3632
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S109013-07	Client sample id	J1HJ82	
Dept sample id	7784-007	Location/Matrix	126-H-1 DEPTH	SOLID
Received	09/01/11	Collected/Weight	08/27/11 09:20	27.41 g
% solids	100.0	Custody/SAF No	RC-214-48	RC-214

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	4.18	0.51	0.132	1.00		U_T

Char. of Hanford Site Coal Ash Components - Other

10/12/11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3632 was composed of seven solid (other solid) samples designated under SAF No. RC-214 with a Project Designation of: Characterization of Hanford Site Coal Ash Components – Other.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 16, 2011.

2.0 ANALYSIS NOTES

2.1 Total Uranium Analysis

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

Joseph Verville **Client Services Manager**	9/16/11 **Date**

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1
Collector: Sparks	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE K3632 (7784)	SAF No.: RC-214	
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3053	Bill of Lading/Air Bill No.: 7951 3916 6465; ~~See OSPC~~ 5/10.8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	~~10~~ 60 mL							
SAMPLE ANALYSIS	Sec item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

018

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ63	OTHER												
J1HJ64	OTHER	8-22-11	0915				X						
J1HJ65	OTHER												
J1HJ66	OTHER												
J1HJ67	OTHER												

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Sparks	8-22-11 1500	SSU #1	8-22-11 1500
Relinquished By/Removed From: SSU-1	AUG 31 2011 0900	L.D. Wall	AUG 31 2011 0900
Relinquished By/Removed From: L.D. Wall	AUG 31 2011 1400	FEDEX	
Relinquished By/Removed From: FED EX		M. MATTAWANA	09/01/11 0930
Relinquished By/Removed From			
Relinquished By/Removed From			

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY SJP DATE 8-27-11

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE K3632 (7784)		SAF No.: RC-214
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: ~~SBERLINE SERVICES / LIONVILLE~~	Offsite Property No.: 3053		Bill of Lading/Air Bill No.: 7951 3916 6465 ~~See OSPC~~

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	~~10mL~~ 500mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

C19

Sample No.	Matrix *	Sample Date	Sample Time									
J1HJ63	OTHER	~~8/24/11~~										
J1HJ64	OTHER											
J1HJ65	OTHER											
J1HJ66	OTHER											
J1HJ67	OTHER	8/24/11	1110				✓					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Fulton	Date/Time: 8/24/11 1100	Received By/Stored In: SSUH1	Date/Time: 8/24/11 1100
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 0900	Received By/Stored In: L.D. Well OSPC	Date/Time: AUG 31 2011 0900
Relinquished By/Removed From: L.D. Well OSPC	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In: TF MATHUANAN	Date/Time: 09/01/11 0930
Relinquished By/Removed From	Date/Time:	Received By/Stored In	Date/Time:
Relinquished By/Removed From	Date/Time:	Received By/Stored In	Date/Time:

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DATE 8/24/11

Matrix *

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-41	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE K3632 (7784)		SAF No.: RC-214
Ice Chest No.: BWS-184	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3053		Bill of Lading/Air Bill No.: 7951 3916 6465 ~~Rec OSPC~~ LW. 8/31/11

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	~~10~~ 60 mL LW. 8/30/11							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No.	Matrix *	Sample Date	Sample Time								
1 J1HJ68	OTHER	~~8/24/11~~					~~[illegible]~~				
2 J1HJ69	OTHER										
3 J1HJ70	OTHER										
4 J1HJ71	OTHER										
5 J1HJ72	OTHER	8/24/11	0950				✓				

U20

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	SSU-1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 3 1 2011 0900	Received By/Stored In: L.D. Wall	AUG 3 1 2011 0900
Relinquished By/Removed From: L.D. Wall	AUG 3 1 2011 1400	Received By/Stored In: FEDEX LW. 8/31/11	Date/Time
Relinquished By/Removed From: FED EX	Date/Time	Received By/Stored In: M. MATHWAMAN	09/01/11 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) [Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc]; Mercury - 7471 - (CV) [Mercury]

REVIEWED BY [illegible] DATE 8/24/11

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-43	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DUPLICATE K3632 (7784)		SAF No.: RC-214
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3053		Bill of Lading/Air Bill No.: 7951 3916 6465 See USPC

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None	20.8/31/11						
Type of Container	G/P	aG	P	G/P							
No. of Container(s)		1	2	1							
Volume	250mL	250mL	1000mL	~~10mL~~ 60 ML	8/30/11						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No.	Matrix *	Sample Date	Sample Time								
J1HJ77	OTHER	8/24/11	0950				✓				

U21

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Fulton	Date/Time: 8/24/11 1200	Received By/Stored In: SSU#1	Date/Time: 8/24/11 1200
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 0900	Received By/Stored In: L.D. Well	Date/Time: AUG 31 2011 0900
Relinquished By/Removed From: L.D. Well	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In: TRANSPORTATION	Date/Time: 09/01/11 0530
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc): Mercury - 7471 - (CV) (Mercury)

REVIEWED BY
DATE 8/24/11

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-46	Page 1 of 1

Collector: C. FULTON	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH K3632 (7784)		SAF No.: RC-214
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3053		Bill of Lading/Air Bill No.: 7951 3916 6465 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None	LW. 8/31/11
Type of Container	G/P	aG	P	G/P	
No. of Container(s)	1	1	4	1	
Volume	250mL	250mL	1000mL	~~10mL~~ 60mL	LW 8/30/11
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270 LW 8/30/11	SPECIAL EXTRACTION - ASTM D3987	Total Uranium	

022

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ80	OTHER	8/24/11	0955				✓						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Fulton	Date/Time: 8/24/11 1200	Received By/Stored In: SSU H1	Date/Time: 8/24/11 1200
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 0900	Received By/Stored In: L.D. Wall	Date/Time: AUG 31 2011 0900
Relinquished By/Removed From: L.D. Wall	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FEDEX	Date/Time:	Received By/Stored In: M. LATHAM	Date/Time: 09/01/11 0930
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS
Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY
DATE 8/24/11

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-47	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH K3632 (17784)	SAF No.: RC-214	
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3053	Bill of Lading/Air Bill No.: 7951 3916 6465 See QSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	~~10mL~~ 60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No.	Matrix *	Sample Date	Sample Time								
J1HJ81	OTHER	8/24/11	1115				✓				

023

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Fulton	Date/Time: 8/24/11 1200	Received By/Stored In: SSU #4	Date/Time: 8/24/11 1200
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 0900	Received By/Stored In: L.D. Wall	Date/Time: AUG 31 2011 0900
Relinquished By/Removed From: L.D. Wall	Date/Time: AUG 31 2011	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FED EX	Date/Time:	Received By/Stored In:	Date/Time: 09/01/11 0920
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY

DATE 8/24/11

Matrix *

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

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

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-48	Page 1 of 1
Collector: Perkins	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH K3632 (17784)	SAF No.: RC-214	
Ice Chest No.: GWS-184	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3053	Bill of Lading/Air Bill No.: 7951 3916 6465 ~~See OSPC~~	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No.	Matrix *	Sample Date	Sample Time								
J1HJ82	OTHER	8-27-11	0920				X				

024

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Perkins	8-27-11 1500	[illegible]	8-27-11 1500
SSU-1	AUG 31 2011 0900	L.D. Wall	AUG 31 2011 0900
L.D. Wall	AUG 31 2011 1400	FEDEX	
FED EX		[illegible]	09/01/11 0930

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 (CVAA Mercury)

REVIEWED BY [illegible] DATE 8-27-11

Matrix *

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

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

WCH-EE-011

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 300 Area Ash Depth			DATA PACKAGE: K3632		
VALIDATOR: ELR		LAB: LLT		DATE: 10/11/01	
			SDG: K3632		
ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☐ Strontium-90	☐ Technetium-99	☐ Alpha Spectroscopy	☐ Gamma Spectroscopy	
X Total Uranium	☐ Radium-22	☐ Tritium			
SAMPLES/MATRIX					
J1HJ64	J1HJ72	J1HJ80	J1HJ82		
J1HJ67	J1HJ77	J1HJ81			
					Osln

1. Completeness ..... ☐ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

_____

_____

_____

_____

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

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

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

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

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

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

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

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

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

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

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

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

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☒ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

_____

_____

_____

_____

8. Tracer Recovery (Levels C, D, E) ..... ☒ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

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

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

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

Comments: _____

_____

_____

_____

_____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

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

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

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

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

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

Field split sample(s) analyzed? ..... Yes No N/A

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

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

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

Comments: no PS or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments: _____

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

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

Results Acceptable? (Levels D, E) Yes No N/A

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

MDA's meet required detection limits? Yes No N/A

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

Comments: no RQL specified

Appendix 6

Additional Documentation Requested by Client

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-016 Method Blank

METHOD BLANK

SDG	7784	Client/Case no	Hanford	SDG K3632	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109013-16	Client sample id	Method Blank		
Dept sample id	7784-016	Material/Matrix		SOLID	
		SAF No	RC-214		

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	0	0.006	0.013	1.00	U	U_T

QC-BLANK #79767

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-015 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7784
Contact Joseph Verville
Client/Case no Hanford SDG K3632
Contract No. S00W235A01

Lab sample id S109013-15
Dept sample id 7784-015
Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-214

ANALYTE	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST	ADDED ug/g	2σ ERR ug/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Uranium	31.8	3.8	0.132	1.00		U_T	33.0	1.3	96	82-118	80-120

QC-LCS #79766

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/16/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3632

7784-017 J1HJ64

DUPLICATE

SDG	7784			Client/Case no	Hanford SDG K3632
Contact	Joseph Verville			Contract	No. S00W235A01
DUPLICATE		ORIGINAL			
Lab sample id	S109013-17	Lab sample id	S109013-01	Client sample id	J1HJ64
Dept sample id	7784-017	Dept sample id	7784-001	Location/Matrix	126-H-1 SURFACE SOLID
		Received	09/01/11	Collected/Weight	08/27/11 09:15 25.52 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-214-40 RC-214

ANALYTE	DUPLICATE ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST	ORIGINAL ug/g	2σ ERR (COUNT)	MDA ug/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Total Uranium	2.43	0.30	0.132	1.00		U_T	2.24	0.25	0.132		8	25	1.0

QC-DUP#1 79768

Char. of Hanford Site Coal Ash Components - Other

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/16/11

Date: 15 October 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 126-H-1
Subject: Semivolatile Organic - Data Package No. K3632-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3632 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
J1HJ64	8/27/11	Other	C	See note 1
J1HJ67	8/24/11	Other	C	See note 1
J1HJ72	8/24/11	Other	C	See note 1
J1HJ77	8/24/11	Other	C	See note 1
J1HJ79	8/24/11	Other	C	See note 1
J1HJ80	8/24/11	Other	C	See note 1
J1HJ81	8/24/11	Other	C	See note 1
J1HJ82	8/27/11	Other	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011 (DOE/RL-2010-113, Rev. 0). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

Holding Times

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

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

All holding times were acceptable.

- **Method Blanks**

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

All method blank results were acceptable.

Field (equipment) Blanks

One field blank (J1HJ79) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

All duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1HJ72/J1HJ77) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All duplicate results were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K3632 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

DOE/RL-2010-113, Rev. 0, *Sampling and Analysis Plan for Characterization of Hanford Site Coal Ash Components/February 2011*, U.S. Department of Energy, February 2011.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

Appendix 2

Summary of Data Qualification

SEMIVOLATILE ORGANIC DATA QUALIFICATION SUMMARY*

SDG: K3632	REVIEWER: ELR	Project: 300 Area Ash Depth	PAGE_1_OF_1
COMMENTS: No qualifiers assigned			

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

Appendix 3

Annotated Laboratory Reports

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ64
1109013-02 (Other Solid)

10/12/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Acenaphthylene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benz[a]anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[a] pyrene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[b] fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[g,h,i] perylene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[k] fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Chrysene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Dibenz[a,h]anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluorene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Indeno[1,2,3-cd]pyrene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Naphthalene	**357 J**	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Phenanthrene	**240 J**	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Pyrene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 2	**3580 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 1	**4910 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:PAH 1	**4430 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Aldol Condensate 1	**221000 A, B, J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Alkane 1	**2940 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Surrogate: 2-Fluorophenol	*77 %*	*25-121*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Phenol-d5	*82 %*	*24-113*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*76 %*	*23-120*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*83 %*	*30-115*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*62 %*	*19-122*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*88 %*	*18-137*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/19/2011 09:19

J1HJ67
1109013-05 (Other Solid)

10/12/11

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Acenaphthene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Acenaphthylene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Anthracene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Benz[a]anthracene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Benzo[a] pyrene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Benzo[b] fluoranthene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Benzo[g,h,i] perylene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Benzo[k] fluoranthene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Chrysene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Dibenz[a,h]anthracene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Fluoranthene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Fluorene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Indeno[1,2,3-cd]pyrene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Naphthalene	**691**	J, D	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Phenanthrene	**250**	J, D	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Pyrene	1270	U	1270	ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
TIC:PAH 1	**11300**	J, D		ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
TIC:Aldol Condensate 1	**4470**	A, B, J, D		ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
TIC:Alkane 1	**4530**	J, D		ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
TIC:Alkane 2	**5510**	J, D		ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
TIC:Aldol Condensate 2	**84700**	A, B, J, D		ug/kg wet	2	L109049	09/04/2011	09/10/2011	8270C
Surrogate: 2-Fluorophenol	*77 %*		*25-121*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*
Surrogate: Phenol-d5	*74 %*		*24-113*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*73 %*		*23-120*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-115*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*36 %*		*19-122*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*75 %*		*18-137*			*L109049*	*09/04/2011*	*09/10/2011*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/19/2011 09:19

J1HJ72
1109013-06 (Other Solid)

K 10/12/11

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Acenaphthene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Acenaphthylene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Anthracene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Benz[a]anthracene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Benzo[a] pyrene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Benzo[b] fluoranthene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Benzo[g,h,i] perylene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Benzo[k] fluoranthene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Chrysene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Dibenz[a,h]anthracene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Fluoranthene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Fluorene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Indeno[1,2,3-cd]pyrene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Naphthalene	**464**	J, D	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Phenanthrene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Pyrene	1260	U	1260	ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
TIC:Unknown 1	**2550**	B, J, D		ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
TIC:Aldol Condensate 1	**4460**	A, B, J, D		ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
TIC:Aldol Condensate 2	**108000**	A, B, J, D		ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
TIC:Alkane 1	**3970**	J, D		ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
TIC:Alkane 2	**2110**	J, D		ug/kg wet	2	L109049	09/04/2011	09/11/2011	8270C
Surrogate: 2-Fluorophenol	*56 %*		*25-121*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*
Surrogate: Phenol-d5	*59 %*		*24-113*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*62 %*		*23-120*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-115*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*10 % **		*19-122*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*73 %*		*18-137*			*L109049*	*09/04/2011*	*09/11/2011*	*8270C*

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WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ77
1109013-11 (Other Solid)

10/12/11

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Acenaphthene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Acenaphthylene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Anthracene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benz[a]anthracene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[a] pyrene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[b] fluoranthene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[g,h,i] perylene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[k] fluoranthene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Chrysene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Dibenz[a,h]anthracene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Fluoranthene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Fluorene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Indeno[1,2,3-cd]pyrene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Naphthalene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Phenanthrene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Pyrene	651 U	651	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:PAH 1	**871 J**		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Unknown 2	**717 J**		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Aldo Condensate 1	**769 A, B, J**		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Aldol Condensate 2	**51700 A, B, J**		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Unknown 1	**953 J**		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Surrogate: 2-Fluorophenol	*24 % **	*25-121*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: Phenol-d5	*26 %*	*24-113*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*24 %*	*23-120*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*28 % **	*30-115*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*16 % **	*19-122*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*27 %*	*18-137*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*

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WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ79
1109013-13 (Other Solid)

10/12/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Acenaphthylene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Anthracene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benz[a]anthracene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[a] pyrene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[b] fluoranthene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[g,h,i] perylene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Benzo[k] fluoranthene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Chrysene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Dibenz[a,h]anthracene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Fluoranthene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Fluorene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Indeno[1,2,3-cd]pyrene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Naphthalene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Phenanthrene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Pyrene	625 U	625	ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Unknown 2	484 J		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Unknown 1	278 B, J		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Aldol Condensate 1	2000 A, B, J		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Aldol Condensate 2	193000 A, B, J		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
TIC:Aldol Condensate 3	280 A, B, J		ug/kg wet	1	L109049	09/04/2011	09/07/2011	8270C
Surrogate: 2-Fluorophenol	*62 %*	*25-121*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: Phenol-d5	*66 %*	*24-113*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*73 %*	*23-120*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*73 %*	*30-115*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*54 %*	*19-122*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*69 %*	*18-137*			*L109049*	*09/04/2011*	*09/07/2011*	*8270C*

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ80
1109013-14 (Other Solid)

10/12/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Acenaphthylene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Anthracene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benz[a]anthracene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[a] pyrene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[b] fluoranthene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[g,h,i] perylene	585 J	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[k] fluoranthene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Chrysene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Dibenz[a,h]anthracene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluoranthene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluorene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Indeno[1,2,3-cd]pyrene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Naphthalene	137 J	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Phenanthrene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Pyrene	656 U	656	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 1	4540 B, J		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 2	3130 J		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Aldol Condensate 1	394000 A, B, J		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 3	5130 J		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Alkane 1	3250 J		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Surrogate: 2-Fluorophenol	*73 %*	*25-121*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Phenol-d5	*90 %*	*24-113*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*106 %*	*23-120*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*105 %*	*30-115*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*40 %*	*19-122*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*119 %*	*18-137*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ81
1109013-15 (Other Solid)

10/12/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Acenaphthylene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Anthracene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benz[a]anthracene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[a] pyrene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[b] fluoranthene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[g,h,i] perylene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[k] fluoranthene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Chrysene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Dibenz[a,h]anthracene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluoranthene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluorene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Indeno[1,2,3-cd]pyrene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Naphthalene	**181 J**	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Phenanthrene	**111 J**	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Pyrene	657 U	657	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:PAH 1	**23800 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:PAH 2	**21100 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 2	**25400 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 1	**11100 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Aldol Condensate 1	**281000 A, B, J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Surrogate: 2-Fluorophenol	*57 %*	*25-121*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Phenol-d5	*68 %*	*24-113*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*84 %*	*23-120*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*80 %*	*30-115*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*32 %*	*19-122*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*98 %*	*18-137*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

J1HJ82
1109013-16 (Other Solid)

10/12/11

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Acenaphthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Acenaphthylene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benz[a]anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[a] pyrene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[b] fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[g,h,i] perylene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Benzo[k] fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Chrysene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Dibenz[a,h]anthracene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluoranthene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Fluorene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Indeno[1,2,3-cd]pyrene	633 U	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Naphthalene	**174 J**	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Phenanthrene	**110 J**	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Pyrene	**104 J**	633	ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 1	**8100 B, J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 3	**8520 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Aldol Condensate 1	**345000 A, B, J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 2	**3660 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
TIC:Unknown 4	**4020 J**		ug/kg wet	1	L109049	09/04/2011	09/09/2011	8270C
Surrogate: 2-Fluorophenol	*46 %*	*25-121*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Phenol-d5	*58 %*	*24-113*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*74 %*	*23-120*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*75 %*	*30-115*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*25 %*	*19-122*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*98 %*	*18-137*			*L109049*	*09/04/2011*	*09/09/2011*	*8270C*

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-214 K3632
LVL #: 1109013

W.O. #: 60049-001-001-0001-00
Date Received: 09-01-2011

SEMIVOLATILE

Eight (8) other solid samples were collected on 08-24,27,-2011.

The samples and associated QC samples were extracted 09-04-2011 and analyzed 09-07,09,10-2011 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for client specified target compounds.

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. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.
2. The samples were extracted and analyzed within holding time.
3. Non-target compounds were detected in these samples.
4. Due to the sample matrix, the samples were extracted with a reduced initial volume. Reporting limits have been adjusted to reflect this change.
5. The following extracted samples required dilution due to the nature of the matrix. The samples J1HJ67 and J1HJ72 required a 2X dilution; reporting limits have been adjusted to reflect the necessary dilutions.
6. Four (4) of seventy-two (72) surrogate recoveries were outside acceptance criteria. The surrogate recovery criteria were not met for samples J1HJ77 and J1HJ72. A copy of the Sample Discrepancy Report (SDR#11MS117) has been enclosed.
7. The method blank was below the reporting limit for all target compounds.
8. All blank spike recoveries were within acceptance criteria.
9. All matrix spike recoveries were within acceptance criteria.
10. The samples were reported on a wet weight 'as received' basis.
11. All initial calibrations associated with this data set were within acceptance criteria.

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

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

13. Internal standard area and retention time criteria were met for all except sample L109049-BS1. The out of criteria sample was re-analyzed on 09-09-2011 with similar results. Only the initial analysis has been reported.

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

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 hardcopy package has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

9/19/11
Date

000000003

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 11MS117

Initiator: Shan Taylor
Date: 9-16-11
Client: Wilkinsburg RC-2114

Batch: 1109013
Samples: JIHJ77
Method: SW846/MCAWW/CLP/ TETP 9-16-11

Parameter: 8270
Matrix: Other-solid
Prep Batch: L109049

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)

Sample JIHJ77 had 4 surrogate recoveries outside QC acceptance Limits. Sample JIHJ72 surrogate 2,4,6 Tribromophenol below QC acceptance criteria

9/19/11

2. Known or Probable Causes(s)

possible matrix effect - samples were cloudy

3. Discussion and Proposed Action Other Description:

namely

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

4. Project Manager Instructions...signature/date: 9/16/11

✓ 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: 9-19-2011 Other Explanation:

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

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

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

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

QA-139-A-0208

000000004

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1
Collector: Sparks	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE	SAF No.: RC-214	
Ice Chest No.: GWS-172	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4737 ~~See OSPC~~ DW 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time										
16	J1HJ63	OTHER	8-27-11	0940	X									
17	J1HJ64	OTHER	8-27-11	0915	X	X	X							
18	J1HJ65	OTHER	8-27-11	1112	X									
19	J1HJ66	OTHER	8-27-11	1105	X									
20	J1HJ67	OTHER												

J22

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Sparks	8-27-11 1500	SSLAH	8-27-11 1500
Relinquished By/Removed From: SSU-1	AUG 31 2011 1000	Received By/Stored In: L.D. Wall	AUG 31 2011 1000
Relinquished By/Removed From: L.D. Wall CHPPO	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: Victor Hernandez	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 82711

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

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

WCH-EE-011

000000023

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-40	Page 1 of 1
Collector: C. Fulton	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 SURFACE	SAF No.: RC-214	
Ice Chest No.: GWS-16	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4601; ~~See OBPC~~ OKO 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	0mL							
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

	Sample No.	Matrix *	Sample Date	Sample Time										
16	J1HJ63	OTHER												
17	J1HJ64	OTHER												
18	J1HJ65	OTHER												
19	J1HJ66	OTHER												
20	J1HJ67	OTHER	8/24/11	1110	✓	✓	✓							

023

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	Received By/Stored In: SSU#1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: L.D. Wall OHPRC	AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wall OHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: Victor Hernandez	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 9 24 11

Matrix *

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

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

WCH-EE-011

000000024

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-41	Page 1 of 1

Collector C. FULTON	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C	Data Turnaround 15 Days
Project Designation Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location 126-H-1 SURFACE		SAF No. RC-214		
Ice Chest No. GWS-172	Field Logbook No. EL-1658	COA BESCAS6000	Method of Shipment FedEx		
Shipped To EBERLINE SERVICES / RICHLAND	Offsite Property No. 3055		Bill of Lading/Air Bill No. 7951 3915 4737 ~~See OSPC~~ AW.8/31/11		

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None								
Type of Container	G/P	aG	P	G/P								
No. of Container(s)	1	1	2	1								
Volume	250mL	250mL	1000mL	0mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium								
Sample No.	Matrix *	Sample Date	Sample Time									
21 J1HJ68	OTHER											
22 J1HJ69	OTHER											
23 J1HJ70	OTHER											
24 J1HJ71	OTHER											
25 J1HJ72	OTHER	8/24/11	0955	✓	✓	✓						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: C. Fulton	Date/Time: 8/24/11 1100	Received By/Stored In: SSU #1	Date/Time: 8/24/11 1100
Relinquished By/Removed From: SSU-1	Date/Time: AUG 31 2011 1000	Received By/Stored In: L.D. Wall OSPRC	Date/Time: AUG 31 2011 1000
Relinquished By/Removed From: L.D. Wall OSPRC	Date/Time: AUG 31 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 9-1-11 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DATE 8 24 11

Matrix *

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

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

WCH-EE-011

000000025

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-43	Page 1 of 1
Collector C. Fulton	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C / Data Turnaround 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DUPLICATE	SAF No. RC-214	
Ice Chest No. GWS-216	Field Logbook No. EL-1658 / COA BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No. 3055	Bill of Lading/Air Bill No. ~~See USPC~~ 7951 3915 4689 LW 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	2	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium 8/24/11							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ77	OTHER	8/24/11	0950	✓	✓								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1200	SSU #1	8/24/11 1200
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: LD. Wall CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: LD. Wall CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FED EX	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DATE 8/24/11

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

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

WCH-EE-011

000000028

025

11

1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-45	Page 1 of 1

Collector: C. Fulton	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 EQUIPMENT BLANK		SAF No.: RC-214
Ice Chest No.: GWS-216	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3055		Bill of Lading/Air Bill No.: 7951 3915 4689

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

N/A

See OSPC DW. 8/31/11

Preservation	None	Cool 4C										
Type of Container	G/P	aG										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270										
Sample No.	Matrix *	Sample Date	Sample Time									
J1HJ79	OTHER	8/24/11	1044	X	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C. Fulton	8/24/11 1100	Received By/Stored In: SSU#1	8/24/11 1100
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FEDEX	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY SPB DATE 12/4/11

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

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

WCH-EE-011

000000030

026

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-46	Page 1 of 1
Collector: C. FULTON	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C; Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH	SAF No.: RC-214	
Ice Chest No.: GWS-16	Field Logbook No.: EL-1658; COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: ~~See OSPC~~ 7951 3915 4601 LW 8/31/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None								
Type of Container	G/P	aG	P	G/P								
No. of Container(s)	1	1	4	1								
Volume	250mL	250mL	1000mL	10mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium 8/26/11								
Sample No.	Matrix *	Sample Date	Sample Time									
J1HJ80	OTHER	8/24/11	0955	✓	✓	✓						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: C. FULTON	8/24/11 1150	Received By/Stored In: SSU-H1	8/24/11 1150
Relinquished By/Removed From: SSU-1	AUG 31 2011 0800	Received By/Stored In: L.D. Wall CHPRC	AUG 31 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	AUG 31 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: HECTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) {Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

REVIEWED BY DATE 8/24/11

Matrix *

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

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

WCH-EE-011

000000031

027

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-47	Page 1 of 1
Collector C. Fulton	Company Contact JOAN KESSNER / Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 9C / Data Turnaround 15 Days
Project Designation Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location 126-H-1 DEPTH	SAF No. RC-214	
Ice Chest No. GWS-16	Field Logbook No. EL-1658 / COA BESCAS6000	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. 3055	Bill of Lading/Air Bill No. 7951 3915 4601 ~~See OSPC~~	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ81	OTHER	8/24/11	~~1110~~ 1115	✓	✓	✓							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: C Fulton	8/24/11 1200	Received By/Stored In: SSU #1	8/24/11 1201
Relinquished By/Removed From: SSU- 1	AUG 3 1 2011 0800	Received By/Stored In: L.D. Wall	AUG 3 1 2011 0800
Relinquished By/Removed From: L.D. Wall	AUG 3 1 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY DATE 9/2/11

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

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

WCH-EE-011

000000032

028

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-48	Page 1 of 1
Collector: Spodes	Company Contact: JOAN KESSNER Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 9C Data Turnaround: 15 Days
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 126-H-1 DEPTH Sample point 17	SAF No.: RC-214	
Ice Chest No.: GWS-172	Field Logbook No.: EL-1658 COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES/LIONVILLE	Offsite Property No.: 3055	Bill of Lading/Air Bill No.: 7951 3915 4737 ~~See OSPC~~	

POSSIBLE SAMPLE ~~HAZARDS~~/REMARKS

NA

Special Handling and/or Storage

Tie to RAD Screen J1HJ46

Preservation	None	Cool 4C	None	None							
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	10mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

Sample No.	Matrix *	Sample Date	Sample Time										
J1HJ82	OTHER	8-22-11	0920	X	X	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Spodes	8-22-11 1500	Received By/Stored In: [signature]	8-22-11 1500
Relinquished By/Removed From: SSU-1	AUG 3 1 2011 1000	Received By/Stored In: L.D. Wall CHPRC [signature]	AUG 3 1 2011 1000
Relinquished By/Removed From: L.D. Wall CHPRC [signature]	AUG 3 1 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-1-11 1000	Received By/Stored In: VICTOR HERNANDEZ	9-1-11 1000
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

Hold TWO containers of Special Extraction for further instructions.

(1) ICP Metals - 6010TR (Client List) (Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

REVIEWED BY [signature] DATE 5-27-12

Matrix *

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

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

WCH-EE-011

029

000000033

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 300 Area Ash Pond			DATA PACKAGE: K3632		
VALIDATOR: ELR		LAB: LLI		DATE: 10/11/11	
			SDG: K3632		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX			
J1HJ64	J1HJ67	J1HJ72	J1HJ77
J1HJ79	J1HJ80	J1HJ81	J1HJ82
			other

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

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

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

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

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

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

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Comments:

no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

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

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

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

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

Comments: _____

7. HOLDING TIMES (all levels)

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

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

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

Laboratory properly identified and coded all TIC? (Levels D, E) ..... Yes No N/A

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

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

Comments: no RQL specified

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L109049 - SW 3540C									
Blank (L109049-BLK1)			Prepared: 09/04/2011 Analyzed: 09/07/2011						
Acenaphthene	330 U	330	ug/kg wet						
Acenaphthylene	330 U	330	ug/kg wet						
Anthracene	330 U	330	ug/kg wet						
Benz[a]anthracene	330 U	330	ug/kg wet						
Benzo[a] pyrene	330 U	330	ug/kg wet						
Benzo[b] fluoranthene	330 U	330	ug/kg wet						
Benzo[g,h,i] perylene	330 U	330	ug/kg wet						
Benzo[k] fluoranthene	330 U	330	ug/kg wet						
Chrysene	330 U	330	ug/kg wet						
Dibenz[a,h]anthracene	330 U	330	ug/kg wet						
Fluoranthene	330 U	330	ug/kg wet						
Fluorene	330 U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330 U	330	ug/kg wet						
Naphthalene	330 U	330	ug/kg wet						
Phenanthrene	330 U	330	ug/kg wet						
Pyrene	330 U	330	ug/kg wet						
Unknown 2	268 J		ug/kg wet						
Unknown 1	97.9 J		ug/kg wet						
Aldol Condensate 3	171 A, J		ug/kg wet						
Aldol Condensate 2	93900 A, J		ug/kg wet						
Aldol Condensate 1	1140 A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1560*		*ug/kg wet*	*2500.0*		*62*	*25-121*		
Surrogate: Phenol-d5	*1660*		*ug/kg wet*	*2500.0*		*66*	*24-113*		
Surrogate: Nitrobenzene-d5	*1180*		*ug/kg wet*	*1666.7*		*71*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1230*		*ug/kg wet*	*1666.7*		*74*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1440*		*ug/kg wet*	*2500.0*		*58*	*19-122*		
Surrogate: p-Terphenyl-d14	*1320*		*ug/kg wet*	*1666.7*		*79*	*18-137*		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3632 Project Manager: Joan Kessner	Reported: 09/19/2011 09:19

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L109049 - SW 3540C									
LCS (L109049-BS1)			Prepared: 09/04/2011 Analyzed: 09/07/2011						
Acenaphthene	1420	330	ug/kg wet	2000.0		71	45-110		40
Acenaphthylene	1470	330	ug/kg wet	2000.0		73	45-115		40
Anthracene	1430	330	ug/kg wet	2000.0		72	45-130		40
Benz[a]anthracene	1540	330	ug/kg wet	2000.0		77	45-130		40
Benzo[a] pyrene	1600	330	ug/kg wet	2000.0		80	45-130		40
Benzo[b] fluoranthene	1630	330	ug/kg wet	2000.0		81	40-130		40
Benzo[g,h,i] perylene	1780	330	ug/kg wet	2000.0		89	45-125		40
Benzo[k] fluoranthene	1560	330	ug/kg wet	2000.0		78	45-125		40
Chrysene	1520	330	ug/kg wet	2000.0		76	45-130		40
Dibenz[a,h]anthracene	1750	330	ug/kg wet	2000.0		87	45-125		40
Fluoranthene	1530	330	ug/kg wet	2000.0		76	45-130		40
Fluorene	1470	330	ug/kg wet	2000.0		74	45-120		40
Indeno[1,2,3-cd]pyrene	1780	330	ug/kg wet	2000.0		89	45-130		40
Naphthalene	1410	330	ug/kg wet	2000.0		71	40-110		40
Phenanthrene	1440	330	ug/kg wet	2000.0		72	50-120		40
Pyrene	1370	330	ug/kg wet	2000.0		68	45-125		40
Surrogate: 2-Fluorophenol	*1680*		*ug/kg wet*	*2500.0*		*67*	*25-121*		
Surrogate: Phenol-d5	*1870*		*ug/kg wet*	*2500.0*		*75*	*24-113*		
Surrogate: Nitrobenzene-d5	*1250*		*ug/kg wet*	*1666.7*		*75*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1250*		*ug/kg wet*	*1666.7*		*75*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1950*		*ug/kg wet*	*2500.0*		*78*	*19-122*		
Surrogate: p-Terphenyl-d14	*1210*		*ug/kg wet*	*1666.7*		*73*	*18-137*		
Matrix Spike (L109049-MS2)		Source: 1109013-02	Prepared: 09/04/2011 Analyzed: 09/09/2011						
Acenaphthene	3130	630	ug/kg wet	3819.2	633 U	82	45-110		40
Acenaphthylene	3050	630	ug/kg wet	3819.2	633 U	80	45-115		40
Anthracene	3370	630	ug/kg wet	3819.2	633 U	88	45-130		40
Benz[a]anthracene	3680	630	ug/kg wet	3819.2	633 U	96	45-130		40
Benzo[a] pyrene	3680	630	ug/kg wet	3819.2	633 U	96	45-130		40
Benzo[b] fluoranthene	4240	630	ug/kg wet	3819.2	633 U	111	40-130		40
Benzo[g,h,i] perylene	3190	630	ug/kg wet	3819.2	633 U	83	45-125		40
Benzo[k] fluoranthene	3920	630	ug/kg wet	3819.2	633 U	103	45-125		40
Chrysene	3800	630	ug/kg wet	3819.2	633 U	100	45-130		40
Dibenz[a,h]anthracene	3940	630	ug/kg wet	3819.2	633 U	103	45-125		40
Fluoranthene	3180	630	ug/kg wet	3819.2	633 U	83	45-130		40
Fluorene	2940	630	ug/kg wet	3819.2	633 U	77	45-120		40
Indeno[1,2,3-cd]pyrene	3590	630	ug/kg wet	3819.2	633 U	94	45-130		40

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WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3632	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/19/2011 09:19

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L109049 - SW 3540C									
Matrix Spike (L109049-MS2)		**Source: 1109013-02**		**Prepared: 09/04/2011 Analyzed: 09/09/2011**					
Naphthalene	2440	630	ug/kg wet	3819.2	357	55	40-110		40
Phenanthrene	3440	630	ug/kg wet	3819.2	240	84	50-120		40
Pyrene	3990	630	ug/kg wet	3819.2	633 U	104	45-125		40
Surrogate: 2-Fluorophenol	*3720*		*ug/kg wet*	*4774.0*		*78*	*25-121*		
Surrogate: Phenol-d5	*4140*		*ug/kg wet*	*4774.0*		*87*	*24-113*		
Surrogate: Nitrobenzene-d5	*2140*		*ug/kg wet*	*3182.7*		*67*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*2600*		*ug/kg wet*	*3182.7*		*82*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*3400*		*ug/kg wet*	*4774.0*		*71*	*19-122*		
Surrogate: p-Terphenyl-d14	*3470*		*ug/kg wet*	*3182.7*		*109*	*18-137*		
Matrix Spike Dup (L109049-MSD2)		**Source: 1109013-02**		**Prepared: 09/04/2011 Analyzed: 09/09/2011**					
Acenaphthene	3000	637	ug/kg wet	3861.0	633 U	78	45-110	5	40
Acenaphthylene	2840	637	ug/kg wet	3861.0	633 U	74	45-115	8	40
Anthracene	3090	637	ug/kg wet	3861.0	633 U	80	45-130	10	40
Benz[a]anthracene	3370	637	ug/kg wet	3861.0	633 U	87	45-130	10	40
Benzo[a] pyrene	3260	637	ug/kg wet	3861.0	633 U	84	45-130	13	40
Benzo[b] fluoranthene	3660	637	ug/kg wet	3861.0	633 U	95	40-130	16	40
Benzo[g,h,i] perylene	3250	637	ug/kg wet	3861.0	633 U	84	45-125	0.7	40
Benzo[k] fluoranthene	3310	637	ug/kg wet	3861.0	633 U	86	45-125	18	40
Chrysene	3390	637	ug/kg wet	3861.0	633 U	88	45-130	13	40
Dibenz[a,h]anthracene	3590	637	ug/kg wet	3861.0	633 U	93	45-125	10	40
Fluoranthene	2880	637	ug/kg wet	3861.0	633 U	75	45-130	11	40
Fluorene	2860	637	ug/kg wet	3861.0	633 U	74	45-120	4	40
Indeno[1,2,3-cd]pyrene	3280	637	ug/kg wet	3861.0	633 U	85	45-130	10	40
Naphthalene	3030	637	ug/kg wet	3861.0	357	69	40-110	23	40
Phenanthrene	3470	637	ug/kg wet	3861.0	240	84	50-120	0.04	40
Pyrene	3890	637	ug/kg wet	3861.0	633 U	101	45-125	4	40
Surrogate: 2-Fluorophenol	*3490*		*ug/kg wet*	*4826.3*		*72*	*25-121*		
Surrogate: Phenol-d5	*3930*		*ug/kg wet*	*4826.3*		*81*	*24-113*		
Surrogate: Nitrobenzene-d5	*2080*		*ug/kg wet*	*3217.5*		*65*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*2430*		*ug/kg wet*	*3217.5*		*76*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*3580*		*ug/kg wet*	*4826.3*		*74*	*19-122*		
Surrogate: p-Terphenyl-d14	*3220*		*ug/kg wet*	*3217.5*		*100*	*18-137*		