0100232

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 11/15/11 INITIAL/DATE

COMMENTS:

SDG K3702 SAF-RC-214

RECEIVED
NOV 30 2011
EDMC

Sample Location: 600-207

Date: 7 November 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 600-207
Subject: Inorganics - Data Package No. K3702-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3702 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
J1HHM9	9/27/11	Other	C	See note 1
J1HHN7	9/27/11	Other	C	See note 1
J1HHP3	9/28/11	Other	C	See note 1
J1HHP6	9/28/11	Other	C	See note 1
J1HHP4	9/27/11	Other	C	See note 1
J1HHP5	9/27/11	Other	C	See note 1
J1HHP7	9/27/11	Other	C	See note 1
J1HHP9	9/27/11	Other	C	See note 1
J1HHR0	9/27/11	Other	C	See note 1
J1HHP8	9/28/11	Other	C	See note 1
J1HHR1	9/28/11	Other	C	See note 1
J1HHR2	9/27/11	Other	C	See note 1
J1HHR3	9/27/11	Other	C	See note 1
J1HHT7	9/27/11	Other	C	See note 1
J1HHT8	9/27/11	Other	C	See note 1
J1HHT9	9/27/11	Other	C	See note 1
J1HHV0	9/27/11	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.

All preparation blank results were acceptable.

Field (Equipment) Blank

One field (equipment) blank (J1HHT7) was submitted for analysis. Eight 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 (40.9%), boron (-0.3), chromium (61.1%), copper (-28.8%), nickel (66.5%), thallium (69.8%) and vanadium (66.3%) results in samples J1HHM9, J1HHN7, J1HHP3, J1HHP6, J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3 and J1HHT7 were qualified as estimates and flagged "J".

Due to matrix spike recoveries outside QC limits, all antimony (35.5%), beryllium (69.5%), chromium (68.8%), copper (41.1%) and vanadium (49.7%) results in samples J1HHT8, J1HHT9 and J1HHV0 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.

Due to RPDs outside QC limits, all barium (35.2%), boron (83.7%), copper (70.6%) and manganese (35.4%) results in samples J1HHM9, J1HHN7, J1HHP3, J1HHP6, J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3 and J1HHT7 were qualified as estimates and flagged "J".

Due to an RPD outside QC limits (41.7%), all beryllium results in samples J1HHT8, J1HHT9 and J1HHV0 were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J1HHR2/J1HHN7) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPDs for boron (35%), lead (38.7%) and vanadium (59.3%) results exceeded QC limits. Under the WCH statement of work, no qualification is required. All field duplicates were acceptable.

- **Analytical Detection Levels**

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

- **Completeness**

Data package No. K3702 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to matrix spike recoveries outside QC limits, all antimony (40.9%), boron (-0.3), chromium (61.1%), copper (-28.8%), nickel (66.5%), thallium (69.8%) and vanadium (66.3%) results in samples J1HHM9, J1HHN7, J1HHP3, J1HHP6, J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3 and J1HHT7 were qualified as estimates and flagged "J".

- Due to matrix spike recoveries outside QC limits, all antimony (35.5%), beryllium (69.5%), chromium (68.8%), copper (41.1%) and vanadium (49.7%) results in samples J1HHT8, J1HHT9 and J1HHV0 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".

- Due to RPDs outside QC limits, all barium (35.2%), boron (83.7%), copper (70.6%) and manganese (35.4%) results in samples J1HHM9, J1HHN7, J1HHP3, J1HHP6,

J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3 and J1HHT7 were qualified as estimates and flagged "J".

- Due to an RPD outside QC limits (41.7%), all beryllium results in samples J1HHT8, J1HHT9 and J1HHV0 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: K3702	REVIEWER: ELR	Project: K3703	PAGE_1_OF_1
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony boron chromium copper nickel thallium vanadium	J	J1HHM9, J1HHN7, J1HHP3, J1HHP6, J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3, J1HHT7	MS recovery
Antimony beryllium chromium copper vanadium	J	J1HHT8, J1HHT9 J1HHV0	MS recovery
uranium	J	All	No LCS analysis
Barium boron copper manganese	J	J1HHM9, J1HHN7, J1HHP3, J1HHP6, J1HHP4, J1HHP5, J1HHP7, J1HHP9, J1HHR0, J1HHP8, J1HHR1, J1HHR2, J1HHR3, J1HHT7	RPD
Beryllium	J	J1HHT8, J1HHT9 J1HHV0	RPD

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

Appendix 3

Annotated Laboratory Reports

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 08:47

J1HHT8
1109125-01 (Other Solid)

11/13/11

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	L110045	10/05/2011	10/14/2011	6010B
Arsenic	4.29		0.794	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Barium	711		0.397	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Beryllium	1.21	J	0.159	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Boron	147		1.59	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cadmium	0.111	B	0.159	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Chromium	7.50	J	0.159	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cobalt	4.42		1.59	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Copper	21.9	J	0.794	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Lead	3.30		0.397	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Manganese	327		3.97	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Molybdenum	1.91		1.59	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Nickel	11.2		3.17	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Selenium	1.29		0.238	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Silver	0.159	U	0.159	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Thallium	0.397	U	0.397	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Uranium	15.9	U J	15.9	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Vanadium	36.8	J	1.98	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Zinc	17.7		7.94	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Mercury	0.0257	U	0.0257	mg/kg wet	1	L110048	10/05/2011	10/06/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 08:47

J1HHT9
1109125-02 (Other Solid) 11/13/11

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Antimony	0.269	B J	0.517	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Arsenic	4.92		0.862	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Barium	653		0.431	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Beryllium	0.658	J	0.172	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Boron	168		1.72	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cadmium	0.186		0.172	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Chromium	8.99	J	0.172	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cobalt	3.56		1.72	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Copper	21.6	J	0.862	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Lead	5.61		0.431	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Manganese	250		4.31	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Molybdenum	2.16		1.72	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Nickel	9.42		3.45	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Selenium	1.83		0.259	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Silver	0.172	U	0.172	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Thallium	0.431	U	0.431	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Uranium	17.2	U J	17.2	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Vanadium	32.9	J	2.16	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Zinc	18.1		8.62	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Mercury	0.0250	U	0.0250	mg/kg wet	1	L110048	10/05/2011	10/06/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 08:47

J1HHV0
1109125-03 (Other Solid)

11/13/11

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	L110045	10/05/2011	10/14/2011	6010B
Arsenic	4.83		0.926	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Barium	680		0.463	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Beryllium	0.847	J	0.185	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Boron	155		1.85	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cadmium	0.139	B	0.185	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Chromium	8.11	J	0.185	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Cobalt	3.98		1.85	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Copper	21.3	J	0.926	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Lead	5.08		0.463	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Manganese	286		4.63	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Molybdenum	1.78	B	1.85	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Nickel	10.6		3.70	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Selenium	1.85		0.278	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Silver	0.185	U	0.185	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Thallium	0.463	U	0.463	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Uranium	18.5	U J	18.5	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Vanadium	32.1	J	2.31	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Zinc	16.0		9.26	mg/kg wet	1	L110045	10/05/2011	10/14/2011	6010B
Mercury	0.0257	U	0.0257	mg/kg wet	1	L110048	10/05/2011	10/06/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHM9
1109127-01 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.577	U J	0.577	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	6.60		0.962	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	958	J	0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	0.903		0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	146	J	1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.122	B	0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	12.9	J	0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	5.74		1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	46.8	J	0.962	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	5.28		0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	486	J	4.81	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.34		1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	16.7	J	3.85	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	1.22		0.288	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.192	U	0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.481	U J	0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	19.2	U J	19.2	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	43.7	J	2.40	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	22.1		9.62	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0273	U	0.0273	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/17/2011 10:43

J1HHN7
1109127-02 (Other Solid)

11/15/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.577	U J	0.577	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	10.6		0.962	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	1210	J	0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	1.43		0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	112	J	1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.232		0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	15.5	J	0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	7.14		1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	35.4	J	0.962	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	11.1		0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	481	J	4.81	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.11		1.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	18.9	J	3.85	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	2.27		0.288	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.192	U	0.192	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.481	U J	0.481	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	19.2	U J	19.2	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	55.3	J	2.40	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	28.5		9.62	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0250	U	0.0250	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP3
1109127-03 (Other Solid)

11/13/00

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.588	U J	0.588	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	6.30		0.980	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	1060	J	0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	1.01		0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	84.0	J	1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.127	B	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	11.8	J	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	5.46		1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	24.6	J	0.980	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	4.94		0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	357	J	4.90	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.35		1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	14.4	J	3.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	1.51		0.294	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.196	U	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.490	U J	0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	19.6	U J	19.6	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	44.4	J	2.45	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	19.3		9.80	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0257	U	0.0257	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP6
1109127-04 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.588	U J	0.588	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	7.25		0.980	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	910	J	0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	1.19		0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	69.8	J	1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.174	B	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	12.3	J	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	5.92		1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	32.3	J	0.980	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	7.03		0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	373	J	4.90	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.69		1.96	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	15.7	J	3.92	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	2.10		0.294	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.196	U	0.196	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.490	U J	0.490	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	19.6	U	19.6	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	47.9	J	2.45	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	24.1		9.80	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0454		0.0250	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

000000008

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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/17/2011 10:43

J1HHP4
1109127-05 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.500	U J	0.500	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	6.19		0.833	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	796	J	0.417	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	0.957		0.167	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	58.3	J	1.67	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.140	B	0.167	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	11.4	J	0.167	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	5.52		1.67	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	24.6	J	0.833	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	6.92		0.417	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	359	J	4.17	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.25		1.67	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	15.8	J	3.33	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	1.88		0.250	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.167	U	0.167	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.417	U J	0.417	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	16.7	U J	16.7	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	41.0	J	2.08	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	22.3		8.33	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0265	U	0.0265	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP5
1109127-06 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.536	U J	0.536	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	6.46		0.893	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	915	J	0.446	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	0.969		0.179	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	103	J	1.79	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.143	B	0.179	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	11.5	J	0.179	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	6.07		1.79	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	28.2	J	0.893	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	6.61		0.446	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	410	J	4.46	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	2.02		1.79	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	16.2	J	3.57	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	1.44		0.268	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.179	U	0.179	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.446	U J	0.446	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	17.9	U J	17.9	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	45.3	J	2.23	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	22.9		8.93	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0270	B	0.0281	mg/kg wet	1	L110110	10/12/2011	10/12/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP7
1109127-07 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.600	U J	0.600	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	5.52		1.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	694	J	0.500	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	0.907		0.200	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	48.0	J	2.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.176	B	0.200	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	11.3	J	0.200	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	5.38		2.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	26.8	J	1.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	6.06		0.500	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	252	J	5.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	1.88	B	2.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	13.1	J	4.00	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	1.95		0.300	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.200	U	0.200	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.500	U J	0.500	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	20.0	U J	20.0	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	38.5	J	2.50	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	20.2		10.0	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	0.0211	B	0.0250	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP9
1109127-08 (Other Solid) 10/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.500	U J	0.500	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Arsenic	6.17		0.833	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	944	J	0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	1.05		0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	63.7	J	1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.175		0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	11.1	J	0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	4.91		1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	25.2	J	0.833	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	6.15		0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	379	J	4.17	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	1.88		1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	14.5	J	3.33	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	1.92		0.250	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.167	U	0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.417	U J	0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	16.7	U J	16.7	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	40.4	J	2.08	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	27.1		8.33	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0279		0.0257	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHR0
1109127-09 (Other Solid) 11/13/11

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	L110056	10/06/2011	10/15/2011	6010B
Arsenic	4.90		0.943	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	979	J	0.472	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	1.11		0.189	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	71.3	J	1.89	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.138	B	0.189	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	9.85	J	0.189	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	4.83		1.89	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	24.3	J	0.943	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	5.47		0.472	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	401	J	4.72	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	2.11		1.89	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	14.3	J	3.77	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	1.60		0.283	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.189	U	0.189	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.472	U J	0.472	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	18.9	U J	18.9	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	40.8	J	2.36	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	19.3		9.43	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0191	B	0.0231	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHP8
1109127-10 (Other Solid)

11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Antimony	0.577	U J	0.577	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Arsenic	8.54		0.962	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	1030	J	0.481	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	1.18		0.192	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	66.0	J	1.92	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.149	B	0.192	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	12.8	J	0.192	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	5.93		1.92	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	29.9	J	0.962	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	14.5		0.481	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	435	J	4.81	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	3.13		1.92	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	16.7	J	3.85	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	2.06		0.288	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.192	U	0.192	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.481	U J	0.481	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	19.2	U J	19.2	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	50.1	J	2.40	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	26.9		9.62	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0221	B	0.0265	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHR1
1109127-11 (Other Solid) 11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.435	U J	0.435	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Arsenic	5.58		0.725	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	802	J	0.362	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	0.833		0.145	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	57.4	J	1.45	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.151		0.145	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	10.9	J	0.145	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	4.96		1.45	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	23.2	J	0.725	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	5.32		0.362	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	315	J	3.62	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	1.89		1.45	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	13.0	J	2.90	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	1.61		0.217	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.145	U	0.145	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.362	U J	0.362	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	14.5	U J	14.5	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	40.6	J	1.81	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	22.1		7.25	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0283		0.0237	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHR2
1109127-12 (Other Solid) 10/13/11

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	L110056	10/06/2011	10/15/2011	6010B
Arsenic	9.58		0.847	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	1250	J	0.424	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	1.46		0.169	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	162	J	1.69	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.213		0.169	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	16.7	J	0.169	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	7.08		1.69	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	38.6	J	0.847	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	7.50		0.424	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	537	J	4.24	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	2.49		1.69	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	19.7	J	3.39	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	1.73		0.254	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.169	U	0.169	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.424	U J	0.424	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	16.9	U J	16.9	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	102	J	2.12	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	22.1		8.47	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0174	B	0.0243	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHR3
1109127-13 (Other Solid)

11/13/4

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.500	U J	0.500	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Arsenic	6.57		0.833	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Barium	1030	J	0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Beryllium	1.18		0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Boron	81.7	J	1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cadmium	0.157	B	0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Chromium	11.4	J	0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Cobalt	5.85		1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Copper	28.0	J	0.833	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Lead	5.60		0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Manganese	390	J	4.17	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Molybdenum	2.46		1.67	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Nickel	17.7	J	3.33	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Selenium	1.64		0.250	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Silver	0.167	U	0.167	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Thallium	0.417	U J	0.417	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Uranium	16.7	U J	16.7	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Vanadium	44.4	J	2.08	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Zinc	19.2		8.33	mg/kg wet	1	L110056	10/06/2011	10/15/2011	6010B
Mercury	0.0297		0.0273	mg/kg wet	1	L110110	10/12/2011	10/13/2011	7471A

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

J1HHT7
1109127-14 (Other Solid)

11/13/11

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Antimony	0.395	U J	0.395	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Arsenic	0.658	U	0.658	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Barium	**2.47**	J	0.329	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Beryllium	**0.0346**	B	0.132	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Boron	1.32	U J	1.32	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cadmium	0.132	U	0.132	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Chromium	**0.298**	J	0.132	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Cobalt	1.32	U	1.32	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Copper	0.658	U J	0.658	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Lead	**0.528**	J	0.329	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Manganese	**7.00**	J	3.29	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Molybdenum	1.32	U	1.32	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Nickel	2.63	U J	2.63	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Selenium	0.197	U	0.197	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Silver	0.132	U	0.132	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Thallium	0.329	U J	0.329	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Uranium	13.2	U J	13.2	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Vanadium	**0.392**	B J	1.64	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Zinc	**1.52**	B	6.58	mg/kg wet	1	L110056	10/06/2011	10/14/2011	6010B
Mercury	**0.0110**	B	0.0250	mg/kg wet	1	L110110	10/12/2011	10/13/2011	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#: 1109127
SDG/SAF#: K3702/RC-214

W.O.#: 60049-001-001-0001-00
Date Received: 09-29-11

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 14 other solid samples.

2. The samples were prepared and analyzed in accordance with methods listed on the data report forms. The other solid 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 L110056-SRM1 due to the standard reference material does not contain Uranium. The soil samples were reported for Uranium due to the matrix spike recovery for Uranium was within the 75-125% control limit.

10. The matrix spike (MS) recoveries for 9 analytes were outside the 75-125% control limits.

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 30 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1HHM9	Antimony	100	99.0
	Barium	1,100	68.8
	Boron	1,100	86.8
	Chromium	100	110.1
	Copper	100	109.2
	Manganese	1,000	84.0
	Nickel	100	103.1
	Thallium	100	90.4
	Vanadium	500	88.3

12. The duplicate analyses for 6 analytes were outside 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 Molybdenum 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

10/18/11
Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-2	Page 1 of 1

Collector S MORRIS	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 600-207 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 ALIONVILLE	Offsite Property No. 3197	Bill of Lading/Air Bill No. ~~Sec 03PC~~ 7975 6604 0459	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Server/ JHHHR4~~ DD 9261 1
NA

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												
J1HHM8 / OTHER												
J1HHM9 / OTHER / 9-27-11 / 1045	X	X	X	X DD 9271 1								
J1HHN0 / OTHER												
J1HHN1 / OTHER												
J1HHN2 / OTHER												

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S. Morris	9/27/11 1530	SSU#1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: Victor Hernandez	9-29-11 0955
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 DD DATE 9274

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

000000027

6 7 8 9 10 031

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-3	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: 7975 6604 0460

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen J1HHR4~~ SJD 9/26/11

NA

SAMPLE ANALYSIS

			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	100mL						
				See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium						
Sample No.	Matrix *	Sample Date	Sample Time										
11 J1HHN3	OTHER												
12 J1HHN4	OTHER												
13 J1HHN5	OTHER												
14 J1HHN6	OTHER												
15 J1HHN7	OTHER	9/27/11	11 11	X	X	X							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S Morris	9/27/11 1530	SSU #1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	L.D. Wall CHPRO	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRO	SEP 28 2011 1400	FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Vigor HEWA	9-29-11 0955
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 [illegible] DATE 9/27/11

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

000000028

032

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-5	Page 1 of 1

Collector: S. MORRIS	Company Contact: JOAN KESSNER	Telephone No.: 375-4689	Project Coordinator: KESSNER, JH
Price Code: 9C	Data Turnaround: 15 Days		
Project Designation: Characterization of Hanford Site Coal Ash Components - Oth	Sampling Location: 600-207 SURFACE		SAF No.: RC-214
Ice Chest No.: GWS - 296	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3200		Bill of Lading/Air Bill No.: 7975 6815 4233

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen J1HHR4~~ NA 9/28/11

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	J1HHP3	OTHER	9/28/11	0808	X									
22	J1HHP4	OTHER												
23	J1HHP5	OTHER												
24	J1HHP6	OTHER	9/28/11	0805	X									
25	J1HHP7	OTHER												

0333

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S. MORRIS	9/28/11 1100	DON BROTHERTON / CHPRC	11:00 SEP 28 2011
Relinquished By/Removed From: DON BROTHERTON / CHPRC	1400 SEP 28 2011	Received By/Stored In: FED EX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	9-29-11 0955
Relinquished By/Removed From		Received By/Stored In	
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)

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

00000029

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-5	Page 1 of 1

Collector: S. MORRIS	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: 600-207 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.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0459 LW 9/28/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Fax to RAD Screen JJHHPA~~ 9/29/11

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	J1HHP3	OTHER												
22	J1HHP4	OTHER	9.27.11	1410	X									
23	J1HHP5	OTHER	9 27 11	1350	X	X	X							
24	J1HHP6	OTHER												
25	J1HHP7	OTHER	9 27 11	1415	X									

034

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: S. Morris	Date/Time: 9/27/11 1530	Received By/Stored In: SSU #1	Date/Time: 1530 SEP 27 2011
Relinquished By/Removed From: SSU-1	Date/Time: 0800 SEP 28 2011	Received By/Stored In: L.D. Wall OHPRC L.D. Wall	Date/Time: 0800 SEP 28 2011
Relinquished By/Removed From: L.D. Wall OHPRC L.D. Wall	Date/Time: SEP 28 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 9-29-11 0955
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 JB DATE 9/27/11

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wp=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-214-6	Page 1 of 1
Collector: S. MORRIS	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: 600-207 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.: 3197	Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0459 LW 9/28/11	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen J1HHR1~~ JJD 9/26/11

NA

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	J1HHP8	OTHER												
27	J1HHP9	OTHER	9 27 11	1420	X									
28	J1HHR0	OTHER	9 27 11	1425	X									
29	J1HHR1	OTHER												

0635

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S. Morris	9/27/11 1530	Received By/Stored In: SSU #1	SEP 27 2011 0530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	9-29-11 0955
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 JJD DATE 9 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

0000000131

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-6	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE		SAF No.: RC-214
Ice Chest No.: GWS - 296	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3200		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6815 4233

000000032

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ DAD 9/26/11

NA

Preservation	None	Cool 4C	None	None	DW 9/28/11						
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	J1HHP8	OTHER	9-28-11	0800	X									
27	J1HHP9	OTHER												
28	J1HHR0	OTHER												
29	J1HHR1	OTHER	9-28-11	0755	X									

036

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Smoris	9/28/11 1100	Received By/Stored In: DON BROTHERTON / CHPRC	1100 SEP 28 2011
Relinquished By/Removed From: DON BROTHERTON / CHPRC	1400 SEP 28 2011	Received By/Stored In: FEDEX	
Relinquished By/Removed From: Fed Ex	9-28-11 0955	Received By/Stored In: VICTOR HERNANDEZ	9-28-11 0955
Relinquished By/Removed From		Received By/Stored In	
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)

Matrix *

S=Solid
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-214-7	Page 1 of 1

Collector: S. MORRIS	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: 600-207 DUPLICATE	SAF No.: RC-214	
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658 — COA: BESCAS6000	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3197	Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0460	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR~~ 9/28/11

NA

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										
J1HHR2	OTHER	9-27-11	1114	X	X	X	9/27/11						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: S. Morris	9/27/11 1530	Received By/Stored In: SSU #1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC L.D. Wall	Date/Time 0800 SEP 28 2011
Relinquished By/Removed From: L.D. Wall CHPRC L.D. Wall	SEP 28 2011 1400	Received By/Stored In: FEDEX	Date/Time
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	Date/Time 9-29-11 0955
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 MB DATE 9/27/11

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

037

000000033

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-8	Page 1 of 1

Collector: S MORRIS	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: 600-207 DUPLICATE		SAF No.: RC-214
Ice Chest No.: GWS - 296	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3200		Bill of Lading/Air Bill No.: ~~See OBPC~~ 7975 6815 4233

000000034

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ JAS 8260

NA

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										
J1HHR3	OTHER	9-27-11	0806	X									

038

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S MORRIS	9/28/11 1100 1215	DON BROTHERTON / CHPRC	SEP 28 2011 1100
Relinquished By/Removed From: DON BROTHERTON / CHPRC	SEP 28 2011 1400	FED EX	
Relinquished By/Removed From: FED EX	9-29-11 0955	VICTOR HERNANDEZ	9-29-11 0955
Relinquished By/Removed From		Received By/Stored In	
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)

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

5'110

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-11	Page 1 of 1

Collector: R HOLEMAN	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: 600-207 EQUIPMENT BLANK		SAF No.: RC-214
Ice Chest No.: 6WS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES/LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: 7975 6604 0460 ~~See OSPC~~ LW. 9/28/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

N/A

SAMPLE ANALYSIS													
Preservation				None	Cool 4C								
Type of Container				G/P	aG								
No. of Container(s)				1	1								
Volume				250mL	250mL								
				See item (1) in Special Instructions.	PAHs - 8270								
Sample No.	Matrix *	Sample Date	Sample Time										
J1HHT7	OTHER	9-27-11	10:00	X	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: R Holeman	Date/Time: 9-27-11 15:20	Received By/Stored In: SSU #1	Date/Time: SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	Date/Time: SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC L.D. Wall	Date/Time: SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC L.D. Wall	Date/Time: SEP 28 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-28-11 0955	Received By/Stored In: Victor Hernandez	Date/Time: 9-28-11 0955
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 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 MP DATE 9-27-11

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

039

000000035

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#: 1109125
SDG/SAF#: K3702/RC-214

W.O.#: 60049-001-001-0001-00
Date Received: 09-29-11

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 3 other solid samples.

2. The samples were 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 L110045-SRM1 due to the standard reference material does not contain Uranium. The soil samples were reported for Uranium due to the matrix spike recovery for Uranium was within the 75-125% control limit.

10. The matrix spike (MS) recoveries for 9 analytes were outside the 75-125% control limits.

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 18 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1HHT8	Antimony	100	104.3
	Barium	1,600	96.7
	Beryllium	100	116.1
	Chromium	100	105.9
	Copper	100	121.4
	Manganese	1,000	95.2
	Nickel	100	112.3
	Thallium	100	96.2
	Vanadium	1,000	86.2

12. The duplicate analyses for 4analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

10/18/11
Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-12	Page 1 of 1

Collector: S. MORRIS	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: 600-207 DEPTH		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0460

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ NA SJS 9/26/11

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									
J1HHT8	OTHER	9-27-11	1050	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From: S. Morris, Date/Time: 9/27/11 1550	Received By/Stored In: SSU-1, Date/Time: 9-27-11 1550 SEP 2 5 2011	Hold TWO containers of Special Extraction for further instructions.	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
Relinquished By/Removed From: SSU-1, Date/Time: SEP 2 8 2011 0800	Received By/Stored In: L.D. Wall CHPRC, Date/Time: SEP 2 8 2011 0800	(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 - (Cold Mercury)	
Relinquished By/Removed From: L.D. Wall CHPRC, Date/Time: SEP 2 8 2011 1400	Received By/Stored In: FEDEX, Date/Time:	REVIEWED BY DATE 9/27/11	
Relinquished By/Removed From: FedEx, Date/Time: 9-27-11 0955	Received By/Stored In: Victor Hernandez, Date/Time: 9-27-11 0955		
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:		
Relinquished By/Removed From: Date/Time:	Received By/Stored In: Date/Time:		

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

WCH-EE-011

000000015

042

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-13	Page 1 of 1

Collector: S MERRIS	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: 600-207 DEPTH		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: 7975 6604 0460 See OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen~~ ~~UHHRA~~ A/A 9/26/11

NA

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	250mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium								
Sample No. / Matrix * / Sample Date / Sample Time												
J1HHT9 / OTHER / 9-27-11 / 1119	X	X	X									

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: S Merris	9/27/11 1530	Received By/Stored In: SSU-1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	9-29-11 0955
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 - (CVA (Method)

REVIEWED BY SJD DATE 9-27-11

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

043

000000016

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-14	Page 1 of 1

Collector: S MORRIS	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: 600-207 DEPTH		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.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0459

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen UHHR4~~ NA

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									
J1HHV0	OTHER	9.27.11	1355	X	X	X						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: S Morris	9/27/11 1530	Received By/Stored In: SSU#1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRO	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRO	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: Victor Hernandez	9-29-11 0955
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 92711

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

000000017

0144

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT:	600-207	DATA PACKAGE:	K3702
VALIDATOR: ELR	LAB: LLI	DATE:	11/3/11
		SDG:	K3702

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

SAMPLES/MATRIX			
J1HHT8	J1HHT9	J1HHU0	J1HHM9
J1HHN7	J1HHP3	J1HHP6	J1HHP4
J1HHP5	J1HHP7	J1HHP9	J1HHR0
J1HHP8	J1HHR1	J1HHR2	J1HHR3
J1HHT7			solid

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:

T7 - 8 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: 5C - MS - antimony (40.9%) ~~barium~~ (18.7) boron (-0.3%)
vanadium chromium (61%) Copper (-29.8%) nickel (66.5%) thallium (66.3%) - J all

4S - MS - antimony beryllium chromium Copper Vanadium - J all

LCS - uranium - no analyte - J all (both prep groups)

NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

45

Comments: S6 - barium boron copper Manganese beryllium
~~silver~~ ~~thallium~~ ~~vanadium~~ - J all
~~45 silver thallium~~ ~~vanadium~~ ~~J all~~
14/15/4

R2/N7 - boron (33%) lead (39.72%) vanadium (59.32%)

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

LIONVILLE LABORATORY
A division of Pharmaceutical 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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/17/2011 10:43

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 L110056 - SW 3050B										
Blank (L110056-BLK1)				Prepared: 10/06/2011 Analyzed: 10/14/2011						
Antimony	0.500	U	0.500	mg/kg wet						
Arsenic	0.833	U	0.833	mg/kg wet						
Barium	0.417	U	0.417	mg/kg wet						
Beryllium	0.167	U	0.167	mg/kg wet						
Boron	1.67	U	1.67	mg/kg wet						
Cadmium	0.167	U	0.167	mg/kg wet						
Chromium	0.167	U	0.167	mg/kg wet						
Cobalt	1.67	U	1.67	mg/kg wet						
Copper	0.833	U	0.833	mg/kg wet						
Lead	0.417	U	0.417	mg/kg wet						
Manganese	4.17	U	4.17	mg/kg wet						
Molybdenum	1.67	U	1.67	mg/kg wet						
Nickel	3.33	U	3.33	mg/kg wet						
Selenium	0.250	U	0.250	mg/kg wet						
Silver	0.167	U	0.167	mg/kg wet						
Thallium	0.417	U	0.417	mg/kg wet						
Uranium	16.7	U	16.7	mg/kg wet						
Vanadium	2.08	U	2.08	mg/kg wet						
Zinc	8.33	U	8.33	mg/kg wet						
Duplicate (L110056-DUP1)		Source: 1109127-01		Prepared: 10/06/2011 Analyzed: 10/14/2011						
Antimony	0.517	U	0.517	mg/kg wet		0.577 U				20
Arsenic	5.78		0.862	mg/kg wet		6.60			13.2	20
Barium	671		0.431	mg/kg wet		958			35.2*	20
Beryllium	0.815		0.172	mg/kg wet		0.903			10.3	20
Boron	59.7		1.72	mg/kg wet		146			83.7*	20
Cadmium	0.143	B	0.172	mg/kg wet		0.122			15.8	20
Chromium	10.5		0.172	mg/kg wet		12.9			20.6*	20
Cobalt	4.73		1.72	mg/kg wet		5.74			19.3	20
Copper	22.4		0.862	mg/kg wet		46.8			70.6*	20
Lead	5.42		0.431	mg/kg wet		5.28			2.51	20
Manganese	340		4.31	mg/kg wet		486			35.4*	20
Molybdenum	1.64	B	1.72	mg/kg wet		2.34			35.0*	20
Nickel	12.3		3.45	mg/kg wet		16.7			30.1*	20
Selenium	1.24		0.259	mg/kg wet		1.22			1.77	20
Silver	0.172	U	0.172	mg/kg wet		0.192 U				20
Thallium	0.431	U	0.431	mg/kg wet		0.481 U				20

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 10:43

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 L110056 - SW 3050B										
Duplicate (L110056-DUP1)		**Source: 1109127-01**		**Prepared: 10/06/2011 Analyzed: 10/14/2011**						
Uranium	17.2	U	17.2	mg/kg wet		19.2 U				20
Vanadium	38.2		2.16	mg/kg wet		43.7			13.2	20
Zinc	23.1		8.62	mg/kg wet		22.1			4.51	20
Matrix Spike (L110056-MS1)		**Source: 1109127-01**		**Prepared: 10/06/2011 Analyzed: 10/14/2011**						
Antimony	19.7		0.577	mg/kg wet	48.077	0.577 U	40.9*	75-125		20
Arsenic	170		0.962	mg/kg wet	192.31	6.60	85.0	75-125		20
Barium	922		0.481	mg/kg wet	192.31	958	-18.8*	75-125		20
Beryllium	4.76		0.192	mg/kg wet	4.8077	0.903	80.3	75-125		20
Boron	145		1.92	mg/kg wet	96.154	146	-0.300*	75-125		20
Cadmium	4.34		0.192	mg/kg wet	4.8077	0.122	87.7	75-125		20
Chromium	24.7		0.192	mg/kg wet	19.231	12.9	61.1*	75-125		20
Cobalt	42.4		1.92	mg/kg wet	48.077	5.74	76.2	75-125		20
Copper	39.9		0.962	mg/kg wet	24.038	46.8	-28.8*	75-125		20
Lead	42.3		0.481	mg/kg wet	48.077	5.28	77.0	75-125		20
Manganese	343		4.81	mg/kg wet	48.077	486	-296*	75-125		20
Molybdenum	79.4		1.92	mg/kg wet	96.154	2.34	80.1	75-125		20
Nickel	48.7		3.85	mg/kg wet	48.077	16.7	66.5*	75-125		20
Selenium	162		0.288	mg/kg wet	192.31	1.22	83.6	75-125		20
Silver	4.06		0.192	mg/kg wet	4.8077	0.192 U	84.5	75-125		20
Thallium	134		0.481	mg/kg wet	192.31	0.481 U	69.8*	75-125		20
Uranium	375		19.2	mg/kg wet	480.77	19.2 U	78.0	75-125		20
Vanadium	75.6		2.40	mg/kg wet	48.077	43.7	66.3*	75-125		20
Zinc	61.2		9.62	mg/kg wet	48.077	22.1	81.3	75-125		20
Reference (L110056-SRM1)				**Prepared: 10/06/2011 Analyzed: 10/14/2011**						
Antimony	49.4		1.58	mg/kg wet	53.000		93.1	0-235.8		
Arsenic	119		2.63	mg/kg wet	114.00		104	82.8-117.54		
Barium	321		1.32	mg/kg wet	307.00		105	79.8-120.2		
Beryllium	112		0.526	mg/kg wet	108.00		104	82.8-117.6		
Boron	84.2		5.26	mg/kg wet	85.100		98.9	67.5-132.8		
Cadmium	234		0.526	mg/kg wet	225.00		104	83.6-116.4		
Chromium	86.5		0.526	mg/kg wet	77.200		112	73.3-126.4		
Cobalt	172		5.26	mg/kg wet	166.00		103	80.7-118.7		
Copper	279		2.63	mg/kg wet	271.00		103	80.8-119.2		
Lead	195		1.32	mg/kg wet	190.00		103	81.6-118.4		
Manganese	1010		13.2	mg/kg wet	965.00		104	69.3-130.5		
Molybdenum	242		5.26	mg/kg wet	235.00		103	76.2-123.8		

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.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/17/2011 10:43

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 L110056 - SW 3050B										
Reference (L110056-SRM1)				Prepared: 10/06/2011 Analyzed: 10/14/2011						
Nickel	229		10.5	mg/kg wet	221.00		104	79.6-120.8		
Selenium	196		0.789	mg/kg wet	187.00		105	75.9-124.6		
Silver	85.5		0.526	mg/kg wet	83.500		102	82.7-117.1		
Thallium	86.2		1.32	mg/kg wet	86.800		99.4	77.3-122.1		
Vanadium	112		6.58	mg/kg wet	98.700		113	75.9-123.6		
Zinc	207		26.3	mg/kg wet	199.00		104	78.4-121.6		
Batch L110110 - SW 7471A Prep										
Blank (L110110-BLK1)				Prepared & Analyzed: 10/12/2011						
Mercury	0.0265	U	0.0265	mg/kg wet						
Duplicate (L110110-DUP3)		Source: 1109127-01		Prepared & Analyzed: 10/12/2011						
Mercury	0.0257	U	0.0257	mg/kg wet		0.0273 U				20
Matrix Spike (L110110-MS3)		Source: 1109127-01		Prepared & Analyzed: 10/12/2011						
Mercury	0.177		0.0257	mg/kg wet	0.14286	0.0273 U	124	75-125		
Reference (L110110-SRM1)				Prepared & Analyzed: 10/12/2011						
Mercury	1.27		0.0290	mg/kg wet	1.2900		98.3	62.6-138		

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 08:47

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 L110045 - SW 3050B										
Blank (L110045-BLK1)				Prepared: 10/05/2011 Analyzed: 10/14/2011						
Antimony	0.462	U	0.462	mg/kg wet						
Arsenic	0.769	U	0.769	mg/kg wet						
Barium	0.385	U	0.385	mg/kg wet						
Beryllium	0.154	U	0.154	mg/kg wet						
Boron	1.54	U	1.54	mg/kg wet						
Cadmium	0.154	U	0.154	mg/kg wet						
Chromium	0.154	U	0.154	mg/kg wet						
Cobalt	1.54	U	1.54	mg/kg wet						
Copper	0.769	U	0.769	mg/kg wet						
Lead	0.385	U	0.385	mg/kg wet						
Manganese	3.85	U	3.85	mg/kg wet						
Molybdenum	1.54	U	1.54	mg/kg wet						
Nickel	3.08	U	3.08	mg/kg wet						
Selenium	0.231	U	0.231	mg/kg wet						
Silver	0.154	U	0.154	mg/kg wet						
Thallium	0.385	U	0.385	mg/kg wet						
Uranium	15.4	U	15.4	mg/kg wet						
Vanadium	1.92	U	1.92	mg/kg wet						
Zinc	7.69	U	7.69	mg/kg wet						
Duplicate (L110045-DUP1)		Source: 1109125-01		Prepared: 10/05/2011 Analyzed: 10/14/2011						
Antimony	0.316	B	0.492	mg/kg wet		0.476 U				20
Arsenic	4.18		0.820	mg/kg wet		4.29			2.62	20
Barium	627		0.410	mg/kg wet		711			12.5	20
Beryllium	0.791		0.164	mg/kg wet		1.21			41.7*	20
Boron	136		1.64	mg/kg wet		147			7.63	20
Cadmium	0.129	B	0.164	mg/kg wet		0.111			14.3	20
Chromium	7.47		0.164	mg/kg wet		7.50			0.298	20
Cobalt	3.64		1.64	mg/kg wet		4.42			19.3	20
Copper	18.6		0.820	mg/kg wet		21.9			16.3	20
Lead	4.25		0.410	mg/kg wet		3.30			25.2*	20
Manganese	263		4.10	mg/kg wet		327			21.8*	20
Molybdenum	1.58	B	1.64	mg/kg wet		1.91			18.8	20
Nickel	9.60		3.28	mg/kg wet		11.2			15.2	20
Selenium	1.44		0.246	mg/kg wet		1.29			11.1	20
Silver	0.164	U	0.164	mg/kg wet		0.159 U				20
Thallium	0.410	U	0.410	mg/kg wet		0.397 U				20

000000008

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: K3702 Project Manager: Joan Kessner	Reported: 10/17/2011 08:47

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 L110045 - SW 3050B										
Duplicate (L110045-DUP1)		**Source: 1109125-01**		**Prepared: 10/05/2011 Analyzed: 10/14/2011**						
Uranium	16.4	U	16.4	mg/kg wet		15.9 U				20
Vanadium	28.1		2.05	mg/kg wet		36.8			26.9*	20
Zinc	16.8		8.20	mg/kg wet		17.7			4.72	20
Matrix Spike (L110045-MS1)		**Source: 1109125-01**		**Prepared: 10/05/2011 Analyzed: 10/14/2011**						
Antimony	15.0		0.508	mg/kg wet	42.373	0.476 U	35.5*	75-125		20
Arsenic	148		0.847	mg/kg wet	169.49	4.29	84.9	75-125		20
Barium	578		0.424	mg/kg wet	169.49	711	-78.4*	75-125		20
Beryllium	4.15		0.169	mg/kg wet	4.2373	1.21	69.5*	75-125		20
Boron	232		1.69	mg/kg wet	84.746	147	99.5	75-125		20
Cadmium	3.94		0.169	mg/kg wet	4.2373	0.111	90.4	75-125		20
Chromium	18.8		0.169	mg/kg wet	16.949	7.50	66.8*	75-125		20
Cobalt	37.3		1.69	mg/kg wet	42.373	4.42	77.7	75-125		20
Copper	30.6		0.847	mg/kg wet	21.186	21.9	41.1*	75-125		20
Lead	36.8		0.424	mg/kg wet	42.373	3.30	79.0	75-125		20
Manganese	241		4.24	mg/kg wet	42.373	327	-204*	75-125		20
Molybdenum	69.8		1.69	mg/kg wet	84.746	1.91	80.1	75-125		20
Nickel	41.3		3.39	mg/kg wet	42.373	11.2	71.2*	75-125		20
Selenium	145		0.254	mg/kg wet	169.49	1.29	84.7	75-125		20
Silver	3.67		0.169	mg/kg wet	4.2373	0.159 U	86.7	75-125		20
Thallium	127		0.424	mg/kg wet	169.49	0.397 U	74.9*	75-125		20
Uranium	335		16.9	mg/kg wet	423.73	15.9 U	79.0	75-125		20
Vanadium	57.9		2.12	mg/kg wet	42.373	36.8	49.7*	75-125		20
Zinc	51.9		8.47	mg/kg wet	42.373	17.7	80.7	75-125		20
Reference (L110045-SRM1)				**Prepared: 10/05/2011 Analyzed: 10/14/2011**						
Antimony	43.1		1.67	mg/kg wet	53.000		81.4	0-235.8		
Arsenic	115		2.78	mg/kg wet	114.00		101	82.8-117.54		
Barium	298		1.39	mg/kg wet	307.00		97.0	79.8-120.2		
Beryllium	103		0.556	mg/kg wet	108.00		95.1	82.8-117.6		
Boron	82.1		5.56	mg/kg wet	85.100		96.5	67.5-132.8		
Cadmium	237		0.556	mg/kg wet	225.00		105	83.6-116.4		
Chromium	77.0		0.556	mg/kg wet	77.200		99.8	73.3-126.4		
Cobalt	159		5.56	mg/kg wet	166.00		95.8	80.7-118.7		
Copper	257		2.78	mg/kg wet	271.00		94.7	80.8-119.2		
Lead	196		1.39	mg/kg wet	190.00		103	81.6-118.4		
Manganese	1000		13.9	mg/kg wet	965.00		104	69.3-130.5		
Molybdenum	239		5.56	mg/kg wet	235.00		102	76.2-123.8		

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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/17/2011 08:47

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 L110045 - SW 3050B										
Reference (L110045-SRM1)				Prepared: 10/05/2011 Analyzed: 10/14/2011						
Nickel	220		11.1	mg/kg wet	221.00		99.5	79.6-120.8		
Selenium	188		0.833	mg/kg wet	187.00		100	75.9-124.6		
Silver	86.4		0.556	mg/kg wet	83.500		103	82.7-117.1		
Thallium	88.3		1.39	mg/kg wet	86.800		102	77.3-122.1		
Vanadium	102		6.94	mg/kg wet	98.700		104	75.9-123.6		
Zinc	207		27.8	mg/kg wet	199.00		104	78.4-121.6		
Batch L110048 - SW 7471A Prep										
Blank (L110048-BLK1)				Prepared: 10/05/2011 Analyzed: 10/06/2011						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L110048-DUP1)		Source: 1109125-01		Prepared: 10/05/2011 Analyzed: 10/06/2011						
Mercury	0.0257	U	0.0257	mg/kg wet		0.0257 U				20
Matrix Spike (L110048-MS1)		Source: 1109125-01		Prepared: 10/05/2011 Analyzed: 10/06/2011						
Mercury	0.157		0.0250	mg/kg wet	0.13889	0.0257 U	113	75-125		
Reference (L110048-SRM1)				Prepared: 10/05/2011 Analyzed: 10/06/2011						
Mercury	1.35		0.0290	mg/kg wet	1.2900		105	62.6-138		

Date: 7 November 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 600-207
Subject: Semivolatile Organic - Data Package No. K3702-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3702 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
J1HHM9	9/27/11	Other	C	See note 1
J1HHN7	9/27/11	Other	C	See note 1
J1HHP5	9/27/11	Other	C	See note 1
J1HHR2	9/27/11	Other	C	See note 1
J1HHT7	9/27/11	Other	C	See note 1
J1HHT8	9/27/11	Other	C	See note 1
J1HHT9	9/27/11	Other	C	See note 1
J1HHV0	9/27/11	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

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

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

Due to a matrix spike recoveries outside QC limits, all benzo(a)pyrene (47% & 47%), benzo(g,h,i)perylene (35% & 34%), dibenz(a,h)anthracene (45% & 38%) and ideno(1,2,3-cd)pyrene (41% & 36%) results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recoveries outside QC limits, all benzo(a)pyrene (36% & 44%), benzo(g,h,i)perylene (25% & 32%), dibenz(a,h)anthracene (32% & 37%) and ideno(1,2,3-cd)pyrene (29% & 34%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

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

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

Due to RPDs outside QC limits, all benzo(g,h,i)perylene (33%), dibenz(a,h)anthracene (33%) and ideno(1,2,3-cd)pyrene (32%) results in samples J1HHT8, J1HHT9 and J1HHV0 were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicates (J1HHR2/J1HHN7) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates 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. No RQLs were specified.

Completeness

Data package No. K3702 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to a matrix spike recoveries outside QC limits, all benzo(a)pyrene (47% & 47%), benzo(g,h,i)perylene (35% & 34%), dibenz(a,h)anthracene (45% & 38%) and ideno(1,2,3-cd)pyrene (41% & 36%) results were qualified as estimates and flagged "J".

- Due to a matrix spike duplicate recoveries outside QC limits, all benzo(a)pyrene (36% & 44%), benzo(g,h,i)perylene (25% & 32%), dibenz(a,h)anthracene (32% & 37%) and ideno(1,2,3-cd)pyrene (29% & 34%) results were qualified as estimates and flagged "J".

- Due to RPDs outside QC limits, all benzo(g,h,i)perylene (33%), dibenz(a,h)anthracene (33%) and ideno(1,2,3-cd)pyrene (32%) results in samples J1HHT8, J1HHT9 and J1HHV0 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 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: K3702	**REVIEWER: ELR**	**Project: 600-207**	**PAGE_1_OF_1**
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
benzo(a)pyrene benzo(g,h,i)perylene dibenz(a,h)anthracene ideno(1,2,3-cd)pyrene	J	All	MS recovery
benzo(a)pyrene benzo(g,h,i)perylene dibenz(a,h)anthracene ideno(1,2,3-cd)pyrene	J	All	MSD recovery
benzo(g,h,i)perylene dibenz(a,h)anthracene ideno(1,2,3-cd)pyrene	J	J1HHT8, J1HHT9 J1HHV0	RPD

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

Appendix 3

Annotated Laboratory Reports

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: K3702 Project Manager: Joan Kessner	Reported: 10/19/2011 14:21

J1HHT8
1109125-01 (Other Solid)

11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Anthracene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	329 U J	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	329 U J	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Chrysene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	329 U J	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	**195** J, D	986	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluorene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	329 U J	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	**451** J, D	986	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	**302** J, D	986	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Pyrene	329 U	329	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 4	**4230** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	**4720** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	**2380** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**36400** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**342000** A, B, J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*49 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*68 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*72 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*81 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*60 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*78 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

000000008

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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/11/2011 12:41

J1HHT9
1109125-02 (Other Solid)

11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Anthracene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Chrysene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluorene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	**51.2 J**	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Pyrene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 4	**926 A, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 3	**98100 A, B, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 2	**1330 A, B, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**535 A, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**2670 J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*53 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*64 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*73 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*73 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*71 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*72 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

LVL
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: K3702 Project Manager: Joan Kessner	Reported: 10/19/2011 14:21

J1HHV0
1109125-03 (Other Solid)

11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Anthracene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	326 U J	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	326 U J	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Chrysene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	326 U J	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluorene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	326 U J	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Pyrene	326 U	326	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	**2880** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	**4620** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**12300** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**37800** A, B, J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 4	**1430** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*56 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*69 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*67 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*68 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*50 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*70 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

LIONVILLE LABORATORY
A Division of Eurofins 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: K3702 Project Manager: Joan Kessner	Reported: 10/19/2011 16:23

J1HHM9
1109127-01 (Other Solid)

✓ 11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Anthracene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	328 U J	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	328 U J	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Chrysene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	328 U J	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	**224** J, D	985	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Fluorene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	328 U J	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	**429** J, D	985	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	**316** J, D	985	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Pyrene	328 U	328	ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 4	**3020** D, J		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	**4880** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	**11600** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**12500** J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**67300** A, B, J, D		ug/kg wet	3	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*72 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*80 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*80 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*83 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*78 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*79 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

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: K3702 Project Manager: Joan Kessner	Reported: 10/12/2011 13:22

J1HHN7
1109127-02 (Other Solid) 11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Anthracene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	326 U J	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	326 U J	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Chrysene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	326 U J	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	**56.4 J**	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluorene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	326 U J	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	**263 J**	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	**93.6 J**	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Pyrene	326 U	326	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**3970 J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	**622 J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**681 A, B, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	**916 J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 2	**79600 A, B, J**		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*54 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*71 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*64 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*67 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*74 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*62 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

LIONVILLE LABORATORY
A division of Pontine Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3702 Project Manager: Joan Kessner	Reported: 10/12/2011 13:22

J1HHP5
1109127-06 (Other Solid) 11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Anthracene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	71.0 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	64.5 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Chrysene	99.6 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	259 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluorene	329 U	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	329 U J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	417	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	306 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Pyrene	115 J	329	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	72500 A, B, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	1240 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 4	617 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	1100 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	17900 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*61 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*76 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*65 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*71 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*84 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*63 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

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.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/12/2011 13:22

J1HHR2
1109127-12 (Other Solid)

11/4/11

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Acenaphthene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Anthracene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	328 U J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	328 U J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Chrysene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	328 U J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	**58.1** J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluorene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	328 U J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	**310** J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	**95.5** J	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Pyrene	328 U	328	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 3	**685** J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	**955** J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	**6150** J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	**464** A, B, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 2	**98100** A, B, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*61 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*80 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*70 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*72 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*82 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*64 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*

LIONVILLE LABORATORY
A division of Fisher 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: K3702 Project Manager: Joan Kessner	Reported: 10/12/2011 13:22

J1HHT7
1109127-14 (Other Solid) 11/4/11

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
		Lionville Laboratory						
Semivolatile Organic Compounds by SW846 8270C								
Acenaphthene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Acenaphthylene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Anthracene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benz[a]anthracene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[a] pyrene	316 U J	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[b] fluoranthene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[g,h,i] perylene	316 U J	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Benzo[k] fluoranthene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Chrysene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Dibenz[a,h]anthracene	316 U J	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluoranthene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Fluorene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Indeno[1,2,3-cd]pyrene	316 U J	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Naphthalene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Phenanthrene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Pyrene	316 U	316	ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 1	470 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 1	761 A, B, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 2	89200 A, B, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Unknown 2	1410 J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
TIC:Aldol Condensate 3	879 A, J		ug/kg wet	1	L110040	10/04/2011	10/07/2011	8270C
Surrogate: 2-Fluorophenol	*58 %*	*25-121*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Phenol-d5	*80 %*	*24-113*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: Nitrobenzene-d5	*71 %*	*23-120*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2-Fluorobiphenyl	*73 %*	*30-115*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*64 %*	*19-122*			*L110040*	*10/04/2011*	*10/07/2011*	*8270C*
Surrogate: p-Terphenyl-d14	*83 %*	*18-137*			*L110040*	*10/04/2011*	*10/07/2011*	*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 K3702
LVL #: 1109125

W.O. #: 60049-001-001-0001-00
Date Received: 09-29-2011

SEMIVOLATILE

Three (3) other solid samples were collected on 09-27-2011.

The samples and associated QC samples were extracted 10-04-2011 and analyzed 10-07-2011 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. The results presented in this report are derived from samples that met LvL's sample acceptance policy.

2. The samples were extracted and analyzed within hold time.

3. Non-target compounds were detected in these samples.

4. The following extracted samples required dilution due to the nature of the matrix. The samples J1HHT8, J1HHV0 and L110040-MS1/MSD1 required a 3X dilution. Reporting limits have been adjusted to reflect this change.

5. Samples reported at a dilution factor of greater than 1 were evaluated to determine if non-detection values could be generated below the nominal PQL reporting limits. The values reported for these samples have been chosen to be consistent with other samples but are still greater than the methodology limit of detection (LOD).

6. All obtainable surrogate recoveries were within acceptance criteria.

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

8. All blank spike recoveries were within acceptance criteria.

9. Six (6) of thirty-two (32) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 11MS129) has been enclosed.

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 19 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.

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

10/19/11
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 11MS129

Initiator: Sharon Saylor
Date: 10-11-11
Client: WCHanford RC-129 IC3702

Batch: 1109125
Samples: L110040-ms1, msd1
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: Other-solid
Prep Batch: L110040

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)

Spike recoveries outside QC acceptance Limits in L110040-ms1, + msd1 but L110040-BS1 is ok

2. Known or Probable Causes(s) possible matrix effect samples required a 3 fold dilution for analysis

Rec 10/21/11

3. Discussion and Proposed Action Other Description:

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

narrate

4. Project Manager Instructions...signature/date: 10/21/11

✓ 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: 11-12-11 Other Explanation:

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

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

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

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

QA-139-A-0208

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-12	Page 1 of 1

Collector: S. MORRIS	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: 600-207 DEPTH		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: ~~See OBPC~~ 7975 6604 0460

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ NA

DS 9/26/11

SAMPLE ANALYSIS												
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~~					
				See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium					
Sample No.	Matrix *	Sample Date	Sample Time									
J1HHT8	OTHER	9-27-11	1050	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From: S. Morris — Date/Time: 9/27/11 1530	Received By/Stored In: SSU-1 — Date/Time: 9-27-11 1530	Hold TWO containers of Special Extraction for further instructions.	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
Relinquished By/Removed From: SSU-1 — Date/Time: SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC — Date/Time: SEP 28 2011 0800	(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)	
Relinquished By/Removed From: L.D. Wall CHPRC — Date/Time: SEP 28 2011 1400	Received By/Stored In: FEDEX — Date/Time:	REVIEWED BY MS DATE 9/27/11	
Relinquished By/Removed From: FedEx — Date/Time: 9-29-11 0955	Received By/Stored In: Victor Hernandez — Date/Time: 9-29-11 0955		
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:		
Relinquished By/Removed From: — Date/Time:	Received By/Stored In: — Date/Time:		

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

WCH-EE-011

000000016

023

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-13	Page 1 of 1

Collector: S MORRIS	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: 600-207 DEPTH		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: 7975 6604 0460 See OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen~~ ~~HHHRA~~ A/A 9/26/11

NA

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	1000mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No. / Matrix * / Sample Date / Sample Time											
J1HHT9 / OTHER / 9-27-11 / 1119	X	X	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: S Morris	Date/Time: 9/27/11 1530	Received By/Stored In: SSU-II	Date/Time: SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	Date/Time: SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	Date/Time: SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	Date/Time: SEP 28 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	Date/Time: 9-29-11 0955
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 - (CVA (Method)

REVIEWED BY SJB DATE 9/27/11

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

000000017

024

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-14	Page 1 of 1

Collector: S MORRIS	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: 600-207 DEPTH		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.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0459

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ NA

LW 9/28/11

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												
J1HHV0 / OTHER / 9-27-11 / 1355	X	X	X									

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: Simon's	S. Morris	9/27/11 1530	SSU-1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1		SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRO	L.D. Wall SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRO	L.D. Wall	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx		9-29-11 0955	Received By/Stored In: VICTOR HERNANDEZ	9-29-11 0955
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 92711

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

0.25

000000018

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 K3702
LVL #: 1109127

W.O. #: 60049-001-001-0001-00
Date Received: 09-29-2011

SEMIVOLATILE

Five (5) other solid samples were collected on 09-27-2011.

The samples and associated QC samples were extracted 10-04-2011 and analyzed 10-07-2011 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. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. The samples were extracted and analyzed within holding time.
3. Non-target compounds were detected in these samples.
4. The following extracted samples required dilution due to the nature of the matrix. The samples J1HHM9 and L110040-MS2/MSD2 required a 3X dilution. Reporting limits have been adjusted to reflect this change.
5. Samples reported at a dilution factor of greater than 1 were evaluated to determine if non-detection values could be generated below the nominal PQL reporting limits. The values reported for these samples have been chosen to be consistent with other samples but are still greater than the methodology limit of detection (LOD)
6. All obtainable surrogate recoveries were within acceptance criteria.
7. The method blank was below the reporting limit for all target compounds.
8. All blank spike recoveries were within acceptance criteria.
9. Seven (7) of thirty-two (32) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 11MS130) has been enclosed.
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 28 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.

14. Manual integrations are performed according to SOP QA-125 to [illegible] 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

10/19/11
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 11MS130

Initiator: Sham Saylor
Date: 10-12-11
Client: waterford RC-214 K3702

Batch: 1109127
Samples: L110040-ms2, msd2
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: other solid
Prep Batch: L110040

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)

Spike recoveries outside QC acceptance Limits in L110040-ms2 + L110040-msd2 but L110040-bs1 is ok

2. Known or Probable Causes(s) possible matrix effect samples required a 3 fold dilution for analysis

Rev 10/2/11

3. Discussion and Proposed Action

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

Other Description: narrate

10/19/11

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

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

5. Final Action...signature/date: 10/21/11

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-214-2	Page 1 of 1

Collector S MORRIS	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 600-207 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. 3197	Bill of Lading/Air Bill No. ~~See OSPC~~ 7975 6604 0459	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen J1HHR4~~ SJD 9261 1

NA

Preservation			None	Cool 4C	None	None	LW 9/28/11					
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									
6 J1HHM8	OTHER											
7 J1HHM9	OTHER	9-27-11	1045	X	X	X	~~X~~ SJD 9271 1					
8 J1HHN0	OTHER											
9 J1HHN1	OTHER											
10 J1HHN2	OTHER											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Morris	9/27/11 1530	SSU #1	SEP 27 2011 1530
SSU-1	SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
L.D. Wall CHPRC	SEP 28 2011 1400	FEDEX	
FedEx	9-29-11 0955	Victor Hernandez	9-29-11 0955

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 SJD DATE 9274

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

000000019

029

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-3	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: ~~Sec OSPC~~ 7975 6604 0400

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen J1HHH4~~ SJD 9/26/11

NA

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									
11 J1HHN3	OTHER											
12 J1HHN4	OTHER											
13 J1HHN5	OTHER											
14 J1HHN6	OTHER											
15 J1HHN7	OTHER	9/27/11	11 11	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: S Morris		9/27/11 1530	SSU # 1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1		SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC		SEP 28 2011 1400	FEDEX	
Relinquished By/Removed From: FedEx		9-29-11 0955	Kitor Hernandez	9-29-11 0955
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 BAD DATE 9/27/11

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

000000820

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-5	Page 1 of 1

Collector: S. MORRIS	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: 600-207 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.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0459 LW 9/28/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Fie to RAD Screen J1HHR1~~ 9/29/11

NA

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	J1HHP3	OTHER												
22	J1HHP4	OTHER	9.27.11	1410	X									
23	J1HHP5	OTHER	9 27 11	1350	X	X	X							
24	J1HHP6	OTHER												
25	J1HHP7	OTHER	9 27 11	1415	X									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: S. Morris	Date/Time: 9/27/11 1530	Received By/Stored In: SSU #1	Date/Time: 1530 SEP 27 2011
Relinquished By/Removed From: SSU-1	Date/Time: 0800 SEP 28 2011	Received By/Stored In: L.D. Wall OHPRC L.D. Wall	Date/Time: 0800 SEP 28 2011
Relinquished By/Removed From: L.D. Wall OHPRC L.D. Wall	Date/Time: SEP 28 2011 1400	Received By/Stored In: FEDEX	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 9-29-11 0955	Received By/Stored In: Victor Hernandez	Date/Time: 9-29-11 0955
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 JD DATE 9/27/11

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

000000022

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-7	Page 1 of 1

Collector: S. MORRIS	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: 600-207 DUPLICATE		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: ~~See OSPC~~ 7975 6604 0460

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen 11HHRC~~ 9/26/11

NA

Preservation	None	Cool 4C	None	None	9/28/11						
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										
J1HHR2	OTHER	9-27-11	1114	X	X	X 9/27/11							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Morris	9/27/11 1530	SSU-1	SEP 27 2011 1530
SSU-1	SEP 28 2011 0800	L.D. Wall ~~CHPRC~~	Date/Time 0800 SEP 28 2011
L.D. Wall ~~CHPRC~~	SEP 28 2011 1400	FEDEX	
FedEx	9-29-11 0955	Victor Hernandez	9-29-11 0955
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 AJB DATE 9/27/11

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

032

000000025

5'11 W

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-11	Page 1 of 1

Collector: R HOLEMAN	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: 600-207 EQUIPMENT BLANK		SAF No.: RC-214
Ice Chest No.: GWS-289	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3197		Bill of Lading/Air Bill No.: 7975 6604 0460

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

N/A

~~See GSPC~~ LW. 9/28/11

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										
J1HHT7	OTHER	9-27-11	10:00	X	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: R Holeman	9-27-11 15:20	SSU #1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FedEx	9-29-11 0955	Received By/Stored In: Victor Hernandez	9-29-11 0955
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 MD DATE 9-27-11

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

033

000000027

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	600-207		DATA PACKAGE:	K3702	
VALIDATOR:	ELR	LAB: LLI		DATE: 11/3/11	
			SDG: K3702		

ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)

SAMPLES/MATRIX
J1HHT8 J1HHT9 J1HHU0 J1HHM9 J1HHN7
J1HHP5 J1HHR2 J1HHT7
solid

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: 40-MS-4-Jall 40-MSD-4-Jall
N7-40-4ant-Jall MSD-4ant-Jall

NOPAS

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: (J9) RPD- 40- 3out - J all

R2/N7

6. SYSTEM PERFORMANCE (Levels D and E)

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

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

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

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

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

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

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

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

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

Comments:

9. SAMPLE CLEANUP (Levels D and E)

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

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

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

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

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

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

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

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

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

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

Comments:

Appendix 6

Additional Documentation Requested by Client

LIONVILLE LABORATORY
A division of Fluorine Enrichment 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: K3702 Project Manager: Joan Kessner	Reported: 10/11/2011 12:41

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 L110040 - SW 3540C									
Blank (L110040-BLK1)			Prepared: 10/04/2011 Analyzed: 10/07/2011						
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						
Trichloro-1-propene	1280 J		ug/kg wet						
Aldol Condensate 4	822 A, J		ug/kg wet						
Aldol Condensate 3	2040 A, J		ug/kg wet						
Aldol Condensate 2	145000 A, J		ug/kg wet						
Aldol Condensate 1	1380 A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1420*		*ug/kg wet*	*2500.0*		*57*	*25-121*		
Surrogate: Phenol-d5	*1610*		*ug/kg wet*	*2500.0*		*65*	*24-113*		
Surrogate: Nitrobenzene-d5	*754*		*ug/kg wet*	*1666.7*		*45*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1180*		*ug/kg wet*	*1666.7*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1550*		*ug/kg wet*	*2500.0*		*62*	*19-122*		
Surrogate: p-Terphenyl-d14	*1310*		*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: K3702 Project Manager: Joan Kessner	Reported: 10/11/2011 12:41

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 L110040 - SW 3540C									
LCS (L110040-BS1)			Prepared: 10/04/2011 Analyzed: 10/07/2011						
Acenaphthene	1550	330	ug/kg wet	2000.0		78	45-110		40
Acenaphthylene	1420	330	ug/kg wet	2000.0		71	45-115		40
Anthracene	1470	330	ug/kg wet	2000.0		73	45-130		40
Benz[a]anthracene	1630	330	ug/kg wet	2000.0		81	45-130		40
Benzo[a] pyrene	1550	330	ug/kg wet	2000.0		78	45-130		40
Benzo[b] fluoranthene	1640	330	ug/kg wet	2000.0		82	40-130		40
Benzo[g,h,i] perylene	1570	330	ug/kg wet	2000.0		79	45-125		40
Benzo[k] fluoranthene	1600	330	ug/kg wet	2000.0		80	45-125		40
Chrysene	1610	330	ug/kg wet	2000.0		80	45-130		40
Dibenz[a,h]anthracene	1570	330	ug/kg wet	2000.0		79	45-125		40
Fluoranthene	1530	330	ug/kg wet	2000.0		77	45-130		40
Fluorene	1560	330	ug/kg wet	2000.0		78	45-120		40
Indeno[1,2,3-cd]pyrene	1580	330	ug/kg wet	2000.0		79	45-130		40
Naphthalene	1480	330	ug/kg wet	2000.0		74	40-110		40
Phenanthrene	1540	330	ug/kg wet	2000.0		77	50-120		40
Pyrene	1480	330	ug/kg wet	2000.0		74	45-125		40
Surrogate: 2-Fluorophenol	*1560*		*ug/kg wet*	*2500.0*		*62*	*25-121*		
Surrogate: Phenol-d5	*1710*		*ug/kg wet*	*2500.0*		*69*	*24-113*		
Surrogate: Nitrobenzene-d5	*1220*		*ug/kg wet*	*1666.7*		*73*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1330*		*ug/kg wet*	*1666.7*		*80*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1710*		*ug/kg wet*	*2500.0*		*68*	*19-122*		
Surrogate: p-Terphenyl-d14	*1350*		*ug/kg wet*	*1666.7*		*81*	*18-137*		
Matrix Spike (L110040-MS1)		Source: 1109125-01	Prepared: 10/04/2011 Analyzed: 10/07/2011						
Acenaphthene	1860 D	970	ug/kg wet	1959.5	986 U	95	45-110		40
Acenaphthylene	1530 D	970	ug/kg wet	1959.5	986 U	78	45-115		40
Anthracene	1630 D	970	ug/kg wet	1959.5	986 U	83	45-130		40
Benz[a]anthracene	1400 D	970	ug/kg wet	1959.5	986 U	71	45-130		40
Benzo[a] pyrene	928 J, D	970	ug/kg wet	1959.5	986 U	47	45-130		40
Benzo[b] fluoranthene	1320 D	970	ug/kg wet	1959.5	986 U	68	40-130		40
Benzo[g,h,i] perylene	695 J, D	970	ug/kg wet	1959.5	986 U	35*	45-125		40
Benzo[k] fluoranthene	1270 D	970	ug/kg wet	1959.5	986 U	65	45-125		40
Chrysene	1430 D	970	ug/kg wet	1959.5	986 U	73	45-130		40
Dibenz[a,h]anthracene	889 J, D	970	ug/kg wet	1959.5	986 U	45	45-125		40
Fluoranthene	1800 D	970	ug/kg wet	1959.5	195	82	45-130		40
Fluorene	1870 D	970	ug/kg wet	1959.5	986 U	95	45-120		40
Indeno[1,2,3-cd]pyrene	796 J, D	970	ug/kg wet	1959.5	986 U	41*	45-130		40

LIONVILLE LABORATORY
A division of Fibertine Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/11/2011 12:41

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 L110040 - SW 3540C										
Matrix Spike (L110040-MS1)		**Source: 1109125-01**		Prepared: 10/04/2011 Analyzed: 10/07/2011						
Naphthalene	2300	D	970	ug/kg wet	1959.5	451	94	40-110		40
Phenanthrene	1930	D	970	ug/kg wet	1959.5	302	83	50-120		40
Pyrene	1560	D	970	ug/kg wet	1959.5	986 U	80	45-125		40
Surrogate: 2-Fluorophenol	*1690*			*ug/kg wet*	*2449.4*		*69*	*25-121*		
Surrogate: Phenol-d5	*2330*			*ug/kg wet*	*2449.4*		*95*	*24-113*		
Surrogate: Nitrobenzene-d5	*1450*			*ug/kg wet*	*1632.9*		*89*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1510*			*ug/kg wet*	*1632.9*		*92*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1780*			*ug/kg wet*	*2449.4*		*73*	*19-122*		
Surrogate: p-Terphenyl-d14	*1440*			*ug/kg wet*	*1632.9*		*88*	*18-137*		
Matrix Spike Dup (L110040-MSD1)		**Source: 1109125-01**		Prepared: 10/04/2011 Analyzed: 10/07/2011						
Acenaphthene	1440	D	972	ug/kg wet	1964.0	986 U	73	45-110	26	40
Acenaphthylene	1210	D	972	ug/kg wet	1964.0	986 U	62	45-115	24	40
Anthracene	1240	D	972	ug/kg wet	1964.0	986 U	63	45-130	27	40
Benz[a]anthracene	1170	D	972	ug/kg wet	1964.0	986 U	60	45-130	18	40
Benzo[a] pyrene	704	J, D	972	ug/kg wet	1964.0	986 U	36*	45-130	28	40
Benzo[b] fluoranthene	1130	D	972	ug/kg wet	1964.0	986 U	57	40-130	16	40
Benzo[g,h,i] perylene	498	J, D	972	ug/kg wet	1964.0	986 U	25*	45-125	33	40
Benzo[k] fluoranthene	1080	D	972	ug/kg wet	1964.0	986 U	55	45-125	16	40
Chrysene	1240	D	972	ug/kg wet	1964.0	986 U	63	45-130	15	40
Dibenz[a,h]anthracene	637	D, J	972	ug/kg wet	1964.0	986 U	32*	45-125	33	40
Fluoranthene	1480	D	972	ug/kg wet	1964.0	195	65	45-130	23	40
Fluorene	1490	D	972	ug/kg wet	1964.0	986 U	76	45-120	23	40
Indeno[1,2,3-cd]pyrene	579	D, J	972	ug/kg wet	1964.0	986 U	29*	45-130	32	40
Naphthalene	1830	D	972	ug/kg wet	1964.0	451	70	40-110	29	40
Phenanthrene	1590	D	972	ug/kg wet	1964.0	302	66	50-120	24	40
Pyrene	1430	D	972	ug/kg wet	1964.0	986 U	73	45-125	9	40
Surrogate: 2-Fluorophenol	*1310*			*ug/kg wet*	*2455.0*		*54*	*25-121*		
Surrogate: Phenol-d5	*1970*			*ug/kg wet*	*2455.0*		*80*	*24-113*		
Surrogate: Nitrobenzene-d5	*1280*			*ug/kg wet*	*1636.7*		*78*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1360*			*ug/kg wet*	*1636.7*		*83*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1580*			*ug/kg wet*	*2455.0*		*64*	*19-122*		
Surrogate: p-Terphenyl-d14	*1530*			*ug/kg wet*	*1636.7*		*94*	*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.	Project: RC-214	
2620 Fermi Avenue	Project Number: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/12/2011 13:22

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 L110040 - SW 3540C									
Blank (L110040-BLK1)			Prepared: 10/04/2011 Analyzed: 10/07/2011						
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						
Trichloro-1-propene	1280 J		ug/kg wet						
Aldol Condensate 4	822 A, J		ug/kg wet						
Aldol Condensate 3	2040 A, J		ug/kg wet						
Aldol Condensate 2	145000 A, J		ug/kg wet						
Aldol Condensate 1	1380 A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1420*		*ug/kg wet*	*2500.0*		*57*	*25-121*		
Surrogate: Phenol-d5	*1610*		*ug/kg wet*	*2500.0*		*65*	*24-113*		
Surrogate: Nitrobenzene-d5	*754*		*ug/kg wet*	*1666.7*		*45*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1180*		*ug/kg wet*	*1666.7*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1550*		*ug/kg wet*	*2500.0*		*62*	*19-122*		
Surrogate: p-Terphenyl-d14	*1310*		*ug/kg wet*	*1666.7*		*79*	*18-137*		

LIONVILLE LABORATORY
A division of Pontine Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-214 Project Number: K3702 Project Manager: Joan Kessner	Reported: 10/12/2011 13:22

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 L110040 - SW 3540C									
LCS (L110040-BS1)			Prepared: 10/04/2011 Analyzed: 10/07/2011						
Acenaphthene	1550	330	ug/kg wet	2000.0		78	45-110		40
Acenaphthylene	1420	330	ug/kg wet	2000.0		71	45-115		40
Anthracene	1470	330	ug/kg wet	2000.0		73	45-130		40
Benz[a]anthracene	1630	330	ug/kg wet	2000.0		81	45-130		40
Benzo[a] pyrene	1550	330	ug/kg wet	2000.0		78	45-130		40
Benzo[b] fluoranthene	1640	330	ug/kg wet	2000.0		82	40-130		40
Benzo[g,h,i] perylene	1570	330	ug/kg wet	2000.0		79	45-125		40
Benzo[k] fluoranthene	1600	330	ug/kg wet	2000.0		80	45-125		40
Chrysene	1610	330	ug/kg wet	2000.0		80	45-130		40
Dibenz[a,h]anthracene	1570	330	ug/kg wet	2000.0		79	45-125		40
Fluoranthene	1530	330	ug/kg wet	2000.0		77	45-130		40
Fluorene	1560	330	ug/kg wet	2000.0		78	45-120		40
Indeno[1,2,3-cd]pyrene	1580	330	ug/kg wet	2000.0		79	45-130		40
Naphthalene	1480	330	ug/kg wet	2000.0		74	40-110		40
Phenanthrene	1540	330	ug/kg wet	2000.0		77	50-120		40
Pyrene	1480	330	ug/kg wet	2000.0		74	45-125		40
Surrogate: 2-Fluorophenol	*1560*		*ug/kg wet*	*2500.0*		*62*	*25-121*		
Surrogate: Phenol-d5	*1710*		*ug/kg wet*	*2500.0*		*69*	*24-113*		
Surrogate: Nitrobenzene-d5	*1220*		*ug/kg wet*	*1666.7*		*73*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1330*		*ug/kg wet*	*1666.7*		*80*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1710*		*ug/kg wet*	*2500.0*		*68*	*19-122*		
Surrogate: p-Terphenyl-d14	*1350*		*ug/kg wet*	*1666.7*		*81*	*18-137*		
Matrix Spike (L110040-MS2)		Source: 1109127-01	Prepared: 10/04/2011 Analyzed: 10/07/2011						
Acenaphthene	1630 D	989	ug/kg wet	1998.7	985 U	81	45-110		40
Acenaphthylene	1450 D	989	ug/kg wet	1998.7	985 U	72	45-115		40
Anthracene	1410 D	989	ug/kg wet	1998.7	985 U	70	45-130		40
Benz[a]anthracene	1250 D	989	ug/kg wet	1998.7	985 U	63	45-130		40
Benzo[a] pyrene	932 J, D	989	ug/kg wet	1998.7	985 U	47	45-130		40
Benzo[b] fluoranthene	1240 D	989	ug/kg wet	1998.7	985 U	62	40-130		40
Benzo[g,h,i] perylene	676 J, D	989	ug/kg wet	1998.7	985 U	34*	45-125		40
Benzo[k] fluoranthene	1150 D	989	ug/kg wet	1998.7	985 U	58	45-125		40
Chrysene	1300 D	989	ug/kg wet	1998.7	985 U	65	45-130		40
Dibenz[a,h]anthracene	767 J, D	989	ug/kg wet	1998.7	985 U	38*	45-125		40
Fluoranthene	1600 D	989	ug/kg wet	1998.7	224	69	45-130		40
Fluorene	1680 D	989	ug/kg wet	1998.7	985 U	84	45-120		40
Indeno[1,2,3-cd]pyrene	726 J, D	989	ug/kg wet	1998.7	985 U	36*	45-130		40

LIONVILLE LABORATORY
A division of Hoefline Anckofield 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: K3702	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/12/2011 13:22

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 L110040 - SW 3540C										
Matrix Spike (L110040-MS2)		**Source: 1109127-01**		**Prepared: 10/04/2011 Analyzed: 10/07/2011**						
Naphthalene	2150	D	989	ug/kg wet	1998.7	429	86	40-110		40
Phenanthrene	1760	D	989	ug/kg wet	1998.7	316	72	50-120		40
Pyrene	1470	D	989	ug/kg wet	1998.7	985 U	74	45-125		40
Surrogate: 2-Fluorophenol	*1930*			*ug/kg wet*	*2498.3*		*77*	*25-121*		
Surrogate: Phenol-d5	*2370*			*ug/kg wet*	*2498.3*		*95*	*24-113*		
Surrogate: Nitrobenzene-d5	*1460*			*ug/kg wet*	*1665.6*		*88*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1490*			*ug/kg wet*	*1665.6*		*89*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*2130*			*ug/kg wet*	*2498.3*		*85*	*19-122*		
Surrogate: p-Terphenyl-d14	*1370*			*ug/kg wet*	*1665.6*		*82*	*18-137*		
Matrix Spike Dup (L110040-MSD2)		**Source: 1109127-01**		**Prepared: 10/04/2011 Analyzed: 10/07/2011**						
Acenaphthene	1780	D	987	ug/kg wet	1994.7	985 U	89	45-110	9	40
Acenaphthylene	1550	D	987	ug/kg wet	1994.7	985 U	78	45-115	7	40
Anthracene	1580	D	987	ug/kg wet	1994.7	985 U	79	45-130	12	40
Benz[a]anthracene	1300	D	987	ug/kg wet	1994.7	985 U	65	45-130	4	40
Benzo[a] pyrene	874	J, D	987	ug/kg wet	1994.7	985 U	44*	45-130	6	40
Benzo[b] fluoranthene	1260	D	987	ug/kg wet	1994.7	985 U	63	40-130	2	40
Benzo[g,h,i] perylene	634	J, D	987	ug/kg wet	1994.7	985 U	32*	45-125	6	40
Benzo[k] fluoranthene	1290	D	987	ug/kg wet	1994.7	985 U	65	45-125	12	40
Chrysene	1360	D	987	ug/kg wet	1994.7	985 U	68	45-130	5	40
Dibenz[a,h]anthracene	737	J, D	987	ug/kg wet	1994.7	985 U	37*	45-125	4	40
Fluoranthene	1790	D	987	ug/kg wet	1994.7	224	79	45-130	13	40
Fluorene	1830	D	987	ug/kg wet	1994.7	985 U	92	45-120	9	40
Indeno[1,2,3-cd]pyrene	677	J, D	987	ug/kg wet	1994.7	985 U	34*	45-130	7	40
Naphthalene	2400	D	987	ug/kg wet	1994.7	429	99	40-110	14	40
Phenanthrene	1960	D	987	ug/kg wet	1994.7	316	82	50-120	13	40
Pyrene	1620	D	987	ug/kg wet	1994.7	985 U	81	45-125	10	40
Surrogate: 2-Fluorophenol	*2170*			*ug/kg wet*	*2493.4*		*87*	*25-121*		
Surrogate: Phenol-d5	*2730*			*ug/kg wet*	*2493.4*		*110*	*24-113*		
Surrogate: Nitrobenzene-d5	*1510*			*ug/kg wet*	*1662.2*		*91*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1580*			*ug/kg wet*	*1662.2*		*95*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*2220*			*ug/kg wet*	*2493.4*		*89*	*19-122*		
Surrogate: p-Terphenyl-d14	*1490*			*ug/kg wet*	*1662.2*		*90*	*18-137*		

Date: 7 November 2011
To: Washington Closure Hanford Inc. (technical representative)
From: ELR Consulting
Project: Characterization of Hanford Site Coal Ash Components – Other - Waste Site 600-207
Subject: Radiochemistry - Data Package No. K3702-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K3702 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
J1HHM9	9/27/11	Other	C	See note 1
J1HHN7	9/27/11	Other	C	See note 1
J1HHP5	9/27/11	Other	C	See note 1
J1HHR2	9/27/11	Other	C	See note 1
J1HHT8	9/27/11	Other	C	See note 1
J1HHT9	9/27/11	Other	C	See note 1
J1HHV0	9/27/11	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 (J1HHR2/J1HHN7) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates 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. No RQLs were specified.

- **Completeness**

Data package No. K3702 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: K3702	REVIEWER: ELR	Project: 600-207	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 K3702

7813-001 J1HHM9

DATA SHEET

SDG	7813	Client/Case no	Hanford	SDG K3702	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-01	Client sample id	J1HHM9		
Dept sample id	7813-001	Location/Matrix	600-207 SURFACE	SOLID	
Received	09/29/11	Collected/Weight	09/27/11 10:45	47.56 g	
% solids	100.0	Custody/SAF No	RC-214-2	RC-214	

✓ 11/4/4

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	2.56	0.32	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 11

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-002 J1HHN7

DATA SHEET

SDG	7813	Client/Case no	Hanford	SDG K3702	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-02	Client sample id	J1HHN7		
Dept sample id	7813-002	Location/Matrix	600-207 SURFACE	SOLID	
Received	09/29/11	Collected/Weight	09/27/11 11:11	43.68 g	
% solids	100.0	Custody/SAF No	RC-214-3	RC-214	

✓ 11/4/11

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	0.52	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-003 J1HHP5

DATA SHEET

SDG	7813	Client/Case no	Hanford		SDG K3702
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-03	Client sample id	J1HHP5		
Dept sample id	7813-003	Location/Matrix	600-207 SURFACE		SOLID
Received	09/29/11	Collected/Weight	09/27/11 13:50	47.82 g	
% solids	100.0	Custody/SAF No	RC-214-5	RC-214	

✓ 10/4/11

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	3.23	0.41	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-004 J1HHR2

DATA SHEET

SDG	7813	Client/Case no	Hanford	SDG K3702	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-04	Client sample id	J1HHR2		
Dept sample id	7813-004	Location/Matrix	600-207 DUPLICATE	SOLID	
Received	09/29/11	Collected/Weight	09/27/11 11:14	45.25 g	
% solids	100.0	Custody/SAF No	RC-214-7	RC-214	

11/4/11

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	5.18	0.64	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-005 J1HHT8

DATA SHEET

SDG	7813	Client/Case no	Hanford		SDG K3702
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-05	Client sample id	J1HHT8		
Dept sample id	7813-005	Location/Matrix	600-207 DEPTH		SOLID
Received	09/29/11	Collected/Weight	09/27/11 10:50	39.09 g	
% solids	100.0	Custody/SAF No	RC-214-12	RC-214	

✓ 11/4/4

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	2.64	0.33	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-006 J1HHT9

DATA SHEET

SDG	7813	Client/Case no	Hanford	SDG K3702	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-06	Client sample id	J1HHT9		
Dept sample id	7813-006	Location/Matrix	600-207 DEPTH	SOLID	
Received	09/29/11	Collected/Weight	09/27/11 11:19	37.60 g	
% solids	100.0	Custody/SAF No	RC-214-13	RC-214	

✓ 11/4/11

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	1.76	0.23	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-007 J1HHV0

DATA SHEET

SDG	7813	Client/Case no	Hanford	SDG K3702	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S109173-07	Client sample id	J1HHV0		
Dept sample id	7813-007	Location/Matrix	600-207 DEPTH	SOLID	
Received	09/29/11	Collected/Weight	09/27/11 13:55	42.17 g	
% solids	100.0	Custody/SAF No	RC-214-14	RC-214	

11/4/11

ANALYTE	CAS NO	RESULT ug/g	2σ ERR (COUNT)	MDA ug/g	RDL ug/g	QUALI-FIERS	TEST
Total Uranium	7440-61-1	3.28	0.41	0.136	1.00		U_T

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3702 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 October 7, 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."

10/7/11

Joseph Verville
Client Services Manager

Date

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-2	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE K3702 (7813)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES BLIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: 7952 3608 9066 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
NA

Special Handling and/or Storage
~~Tic in RAD Screen JJ11HR1~~ JJ 9261
NA

Preservation	None	Cool 4C	None	None	LW. 9/28/11
Type of Container	G/P	G	P	G/P	
No. of Container(s)	1	1	2	1	
Volume	250mL	250mL	1000mL	~~10mL~~ 250mL	9/27/11

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium
J1HHM8	OTHER						
J1HHM9	OTHER	9.27.11	0945				X
J1HHN0	OTHER						
J1HHN1	OTHER						
J1HHN2	OTHER						

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: S. Morris		9/27/11 1530	SSU #1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1		SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC		SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FED EX			Received By/Stored In: [illegible]	09/29/11 0930
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 9278

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-214-3	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE K3702 (7813)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: 7952 3608 9066 ~~See OSPC~~ LW 9/28/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RID Screen J1HHR1~~ 926N

NA

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~~ 60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							

619

Sample No.	Matrix *	Sample Date	Sample Time									
J1HHN3	OTHER											
J1HHN4	OTHER											
J1HHN5	OTHER											
J1HHN6	OTHER											
J1HHN7	OTHER	9/27/11	1111				X					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: S Morris	9/27/11 1550	Received By/Stored In: SSU-1	9-27-11 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FED EX		Received By/Stored In: F. MATAUTAN	09/29/11 0930
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 92711

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-214-5	Page 1 of 1

Collector: S. MORRIS	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: 600-207 SURFACE K3702 (7813)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
~~Shipped To:~~ EBERLINE SERVICES, LIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: 7952 3608 9066 ~~See USPC~~

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RID Screen J1HHR4~~ NA

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~~ 60mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No. / Matrix * / Sample Date / Sample Time											
J1HHP3 / OTHER											
J1HHP4 / OTHER											
J1HHP5 / OTHER / 9/27/11 / 1350				X							
J1HHP6 / OTHER											
J1HHP7 / OTHER											

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	S Morris	9/27/11 1530	SSU #1	SEP 27 2011 1530
Relinquished By/Removed From	SSU-1	SEP 28 2011 0800	L.D. Wal CHPRC	SEP 28 2011 0800
Relinquished By/Removed From	L.D. Wal CHPRC	SEP 28 2011 1400	FEDEX	
Relinquished By/Removed From	FED EX		M. MATACHMAN	09/29/11 0930
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 92711

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-214-7	Page 1 of 1

Collector: R Holeman	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: 600-207 DUPLICATE K3T02 (78/3)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: 7952 36089066

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RID Screen J1HHR1~~ NA

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				
J1HHR2	OTHER	9-27-11	1114				X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R Holeman	9-27-11 1530	SSU-1	9-27-11 1530
SSU-1	SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
L.D. Wall CHPRC	SEP 28 2011 1400	FEDEX	
FED EX		TF-UATAUMAN	09/29/11 0930

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 JJD DATE 9/27/11

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-214-12	Page 1 of 1

Collector: S MORRIS	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: 600-207 DEPTH K3702 (7813)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: 7952 3608 9066 ~~See OSPC~~ LW 9/28/11

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ NA 410926 0

SAMPLE ANALYSIS												
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 410 92711					
				See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium					
Sample No.	Matrix *	Sample Date	Sample Time									
J1HHT8	OTHER	9/27/11	1050				X					

U22

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S MORRIS	9/27/11 1530	SSU-1	SEP 27 2011 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	FEDEX	
Relinquished By/Removed From: FED EX		M. NATARAJAN	09/29/11 0930
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 9/29/11

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-214-13	Page 1 of 1

Collector: S MORRIS	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: 600-207 DEPTH K3702 (7813)		SAF No.: RC-214
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: 3196		Bill of Lading/Air Bill No.: See ~~08~~PC 7952 3608 9066

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Tie to RAD Screen J1HHR4~~ JH 9/26/11

NA

Preservation	None	Cool 4C	None	None	AW. 9/28/11							
Type of Container	G/P	aG	P	G/P								
No. of Container(s)	1	1	4	1								
Volume	250mL	250mL	1000mL	~~10mL~~ 60mL	JH 9/27/11							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium								

623

Sample No.	Matrix *	Sample Date	Sample Time										
J1HHT9	OTHER	9-27-11	1119				X						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: S Morris	9/27/11 1530	Received By/Stored In: SSU-1	9-27-11 1530
Relinquished By/Removed From: SSU-1	SEP 28 2011 0800	Received By/Stored In: L.D. Wall CHPRC	SEP 28 2011 0800
Relinquished By/Removed From: L.D. Wall CHPRC	SEP 28 2011 1400	Received By/Stored In: FEDEX	
Relinquished By/Removed From: FED EX		Received By/Stored In:	09/28/11 0930
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 MA DATE 92711

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-214-14	Page 1 of 1

Collector: S. MORRIS	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: 600-207 DEPTH K3702 (7813)	SAF No.: RC-214	
Ice Chest No.: GWS-249	Field Logbook No.: EL-1658	COA: BESCAS6000	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: 3196	Bill of Lading/Air Bill No.: 7952 36089066 See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~File to RAD Screen JHHHRV~~ 9/26/11

NA

Preservation	None	Cool 4C	None	None	LW 9/28/11						
Type of Container	G/P	aG	P	G/P							
No. of Container(s)	1	1	4	1							
Volume	250mL	250mL	1000mL	~~TOTAL~~ 60ml RSV 9-27-11							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PAHs - 8270	SPECIAL EXTRACTION - ASTM D3987	Total Uranium							
Sample No. / Matrix * / Sample Date / Sample Time											
J1HHV0 / OTHER / 9-27-11 / 1355				X							

024

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
S. Morris	9/27/11 1530	SSU	SEP 27 2011 1530
SSU-1	SEP 28 2011 0800	L.D. Wall CHPRC	SEP 28 2011 0800
L.D. Wall CHPRC	SEP 28 2011 1400	FEDEX	
FED EX		[illegible]	09/29/11 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 - (CV) (Mercury)

REVIEWED BY [illegible] DATE 9/27/11

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:	600-207		DATA PACKAGE:	K3702	
VALIDATOR:	ELR	LAB: EB		DATE: 11/3/11	
			SDG:	K3702	

ANALYSES PERFORMED					
☐ Gross Alpha/Beta	☐ Strontium-90	☐ Technetium-99	☐ Alpha Spectroscopy	☐ Gamma Spectroscopy	
☒ Total Uranium	☐ Radium-22	☐ Tritium			

SAMPLES/MATRIX
J1HHM9 J1HHN7 J1HHP5 J1HHR2 J1HHT8
J1HHT9 J1HHV0
Solid

1. Completeness ..... ☐ N/A

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

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ 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: R2/N7

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: _____

_____

_____

_____

_____

Appendix 6

Additional Documentation Requested by Client

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-009 Method Blank

METHOD BLANK

SDG	7813	Client/Case no	Hanford SDG K3702
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S109173-09	Client sample id	Method Blank
Dept sample id	7813-009	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	0.014	1.00	U	U_T

QC-BLANK #80093

Lab id	EBRLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-008 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7813 Client/Case no Hanford SDG K3702
Contact Joseph Verville Contract No. S00W235A01

Lab sample id S109173-08 Client sample id Lab Control Sample
Dept sample id 7813-008 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	31.2	3.9	0.136	1.00		U_T	33.0	1.3	95	81-119	80-120

QC-LCS #80092

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/07/11

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3702

7813-010 J1HHM9

DUPLICATE

SDG	7813			Client/Case no	Hanford SDG K3702
Contact	Joseph Verville			Contract	No. 900W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S109173-10	Lab sample id	S109173-01	Client sample id	J1HHM9
Dept sample id	7813-010	Dept sample id	7813-001	Location/Matrix	600-207 SURFACE SOLID
		Received	09/29/11	Collected/Weight	09/27/11 10:45 47.56 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-214-2 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	2.89	0.36	0.136	1.00		U_T	2.56	0.32	0.136		12	27	1.4

QC-DUP#1 80094

CHARACTERIZATION OF HANFORD SITE COAL ASH COMPONENTS - OTHER

Lab id	EBERLNE
Protocol	RC-214
Version	Ver 1.0
Form	DVD-DUP
Version	1.06
Report date	10/07/11