0099921

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

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt H4-21 KW 10/13/11
INITIAL/DATE

**COMMENTS:**

**SDG K3346 SAF-RC-214**

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

**Sample Location: 126-B-1**

RECEIVED
OCT 21 2011
EDMC

EBERLINE SERVICES

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May 19, 2011

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MAY 2011

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A00**
**Eberline Analytical S1-05-009-7858, SDG K3346**

Dear Ms. Kessner:

Enclosed is the data report for four solid (other) samples designated under SAF No. RC-214 received at Eberline Analytical on May 3, 2011. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Client Services Manager

*NJV/ljb*

*Enclosure: Data Package*

## 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Groups K3346 was composed of four solid (other) samples designated under SAF No. RC-214 with a Project Designation of: Characterization of Hanford Site Coal Ash Components - Oth.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on May 17, 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."**

N. J. Verville

**N. Joseph Verville**
**Client Services Manager**

5/19/11

**Date**

# E B E R L I N E  A N A L Y T I C A L / R I C H M O N D
## SAMPLE DELIVERY GROUP K3346

| | |
|---|---|
| SDG | 7858 |
| Contact | N.Joseph Verville |

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Case no | SDG_K3346 |

## S U M M A R Y  D A T A  S E C T I O N

### T A B L E  O F  C O N T E N T S


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Prepared by

Reviewed by

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | RC-214 |
| Version | Ver 1.0 |
| Form | DVD-TOC |
| Version | 3.06 |
| Report date | 05/17/11 |

SDG 7858
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

# ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.



Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/17/11

# ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7858
Contact N.Joseph Verville

## LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| S105009-02 | J1HHX0 | 126-B-1 SURFACE | SOLID | | RC-214 | RC-214-21 | 04/27/11 08:35 |
| S105009-03 | J1HHX8 | 126-B-1 SURFACE | SOLID | | RC-214 | RC-214-22 | 04/25/11 14:15 |
| S105009-05 | J1HJ08 | 126-B-1 DEPTH | SOLID | | RC-214 | RC-214-29 | 04/26/11 09:05 |
| S105009-06 | J1HJ09 | 126-B-1 DEPTH | SOLID | | RC-214 | RC-214-30 | 04/22/11 08:40 |
| S105009-08 | Lab Control Sample | | SOLID | | RC-214 | | |
| S105009-09 | Method Blank | | SOLID | | RC-214 | | |
| S105009-13 | Duplicate (S105009-02) | 126-B-1 SURFACE | SOLID | | RC-214 | | 04/27/11 08:35 |

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 05/17/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7858
Contact N.Joseph Verville

## QC SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 7858 | RC-214-21 | J1HHX0 | SOLID | 100.0 | 98.15 g | | 05/03/11 | 6 | S105009-02 | 7858-002 |
| | RC-214-22 | J1HHX8 | SOLID | 100.0 | 67.68 g | | 05/03/11 | 8 | S105009-03 | 7858-003 |
| | RC-214-29 | J1HJ08 | SOLID | 100.0 | 87.39 g | | 05/03/11 | 7 | S105009-05 | 7858-005 |
| | RC-214-30 | J1HJ09 | SOLID | 100.0 | 97.25 g | | 05/03/11 | 11 | S105009-06 | 7858-006 |
| | | Method Blank | SOLID | | | | | | S105009-09 | 7858-009 |
| | | Lab Control Sample | SOLID | | | | | | S105009-08 | 7858-008 |
| | | Duplicate (S105009-02) | SOLID | 100.0 | 98.15 g | | 05/03/11 | 6 | S105009-13 | 7858-013 |

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/17/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7858
Contact N.Joseph Verville

## PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kinetic Phosphorimetry, ug | | | | | | | | | | | | |
| U_T | SOLID | Uranium, Total in Solids | 7299-119 | | 4 | | | 1 | 1 | 1/1 | | |

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 05/17/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7858
Contact N.Joseph Verville

## LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| LAB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| S105009-02 04/27/11 05/03/11 | J1HHX0 126-B-1 SURFACE RC-214-21 | RC-214 | SOLID | 7858-002 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-03 04/25/11 05/03/11 | J1HHX8 126-B-1 SURFACE RC-214-22 | RC-214 | SOLID | 7858-003 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-05 04/26/11 05/03/11 | J1HJ08 126-B-1 DEPTH RC-214-29 | RC-214 | SOLID | 7858-005 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-06 04/22/11 05/03/11 | J1HJ09 126-B-1 DEPTH RC-214-30 | RC-214 | SOLID | 7858-006 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-08 | Lab Control Sample | RC-214 | SOLID | 7858-008 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-09 | Method Blank | RC-214 | SOLID | 7858-009 | U_T | R1 | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |
| S105009-13 04/27/11 05/03/11 | Duplicate (S105009-02) 126-B-1 SURFACE | RC-214 | SOLID | 7858-013 | U_T | | 05/18/11 | 05/18/11 | BW | Uranium, Total in Solids |

## COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| U_T | RC-214 | Uranium, Total in Solids | UTOT_KPA | 4 | | | 1 | 1 | 1 | 7 |
| TOTALS | | | | 4 | | | 1 | 1 | 1 | 7 |

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 05/17/11

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

7858-009 **Method Blank**

## METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7858 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N.Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S105009-09 | Client sample id | Method Blank | | |
| Dept sample id | 7858-009 | Material/Matrix | | SOLID | |
| | | SAF No | RC-214 | | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | -0.003 | 0.006 | 0.013 | 1.00 | U | U_T |

QC-BLANK #78372

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | RC-214 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7858-008

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7858

Contact N.Joseph Verville

Client/Case no Hanford SDG K3346

Contract No. S00W235A00

Lab sample id S105009-08

Dept sample id 7858-008

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-214

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 34.8 | 4.0 | 0.128 | 1.00 | | U_T | 36.2 | 1.4 | 96 | 82-118 | 80-120 |

QC-LCS #78371

Lab id EBRLNE

Protocol RC-214

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 05/17/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7858-013 J1HHX0

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7858 | | | Client/Case no | Hanford SDG K3346 |
| Contact | N.Joseph Verville | | | Contract | No. S00W235A00 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | S105009-13 | Lab sample id | S105009-02 | Client sample id | J1HHX0 |
| Dept sample id | 7858-013 | Dept sample id | 7858-002 | Location/Matrix | 126-B-1 SURFACE SOLID |
| | | Received | 05/03/11 | Collected/Weight | 04/27/11 08:35 98.15 g |
| % solids | 100.0 | % solids | 100.0 | Custody/SAF No | RC-214-21 RC-214 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | DER σ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 5.48 | 0.62 | 0.128 | 1.00 | | U_T | 5.39 | 0.61 | 0.128 | | 2 | 24 | 0.2 |

QC-DUP#2 78495

Characterization of Hanford Site Coal Ash Components - Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | RC-214 |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

**7858-002** **J1HHX0**

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7858 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N.Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S105009-02 | Client sample id | J1HHX0 | |
| Dept sample id | 7858-002 | Location/Matrix | 126-B-1 SURFACE | SOLID |
| Received | 05/03/11 | Collected/Weight | 04/27/11 08:35 | 98.15 g |
| % solids | 100.0 | Custody/SAF No | RC-214-21 | RC-214 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 5.39 | 0.61 | 0.128 | 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 | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

7858-003 J1HHX8

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7858 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N.Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S105009-03 | Client sample id | J1HHX8 | | |
| Dept sample id | 7858-003 | Location/Matrix | 126-B-1 SURFACE | SOLID | |
| Received | 05/03/11 | Collected/Weight | 04/25/11 14:15 | 67.68 g | |
| % solids | 100.0 | Custody/SAF No | RC-214-22 | RC-214 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 4.13 | 0.47 | 0.128 | 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 | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7858-005 J1HJ08

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7858 | Client/Case no | Hanford | SDG K3346 |
| Contact | N.Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S105009-05 | Client sample id | J1HJ08 | |
| Dept sample id | 7858-005 | Location/Matrix | 126-B-1 DEPTH | SOLID |
| Received | 05/03/11 | Collected/Weight | 04/26/11 09:05 | 87.39 g |
| % solids | 100.0 | Custody/SAF No | RC-214-29 | RC-214 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 3.56 | 0.41 | 0.128 | 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 | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

**7858-006** **J1HJ09**

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7858 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N.Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S105009-06 | Client sample id | J1HJ09 | |
| Dept sample id | 7858-006 | Location/Matrix | 126-B-1 DEPTH | SOLID |
| Received | 05/03/11 | Collected/Weight | 04/22/11 08:40 | 97.25 g |
| % solids | 100.0 | Custody/SAF No | RC-214-30 | RC-214 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium (ug/g) | 7440-61-1 | 6.75 | 0.77 | 0.128 | 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 | 05/17/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

Test U T Matrix SOLID
SDG 7858
Contact N.Joseph Verville

## LAB METHOD SUMMARY

URANIUM, TOTAL IN SOLIDS
KINETIC PHOSPHORIMETRY, UG

Client Hanford
Contract No. S00W235A00
Contract SDG K3346

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Total Uranium |
|---|---|---|---|---|---|
| Preparation batch 7299-119 | | | | | |
| S105009-02 | R1 | | 7858-002 | J1HHX0 | 5.39 |
| S105009-03 | R1 | | 7858-003 | J1HHX8 | 4.13 |
| S105009-05 | R1 | | 7858-005 | J1HJ08 | 3.56 |
| S105009-06 | R1 | | 7858-006 | J1HJ09 | 6.75 |
| S105009-08 | R1 | | 7858-008 | Lab Control Sample | ok |
| S105009-09 | R1 | | 7858-009 | Method Blank | U |
| S105009-13 | | | 7858-013 | Duplicate (S105009-02) | ok |
| Nominal values and limits from method | | | | RDLs (ug/g) | 1.00 |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA ug/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 7299-119 | | | 2σ prep error | Reference Lab Notebook 7299 pg. 119 | | | | | | | | | | | | |
| S105009-02 | R1 | | J1HHX0 | 0.128 | 0.0500 | | | | | | | | 21 | 05/17/11 | 05/18 | KPA-001 |
| S105009-03 | R1 | | J1HHX8 | 0.128 | 0.0500 | | | | | | | | 23 | 05/17/11 | 05/18 | KPA-001 |
| S105009-05 | R1 | | J1HJ08 | 0.128 | 0.0500 | | | | | | | | 22 | 05/17/11 | 05/18 | KPA-001 |
| S105009-06 | R1 | | J1HJ09 | 0.128 | 0.0500 | | | | | | | | 26 | 05/17/11 | 05/18 | KPA-001 |
| S105009-08 | R1 | | Lab Control Sample | 0.128 | 0.0500 | | | | | | | | | 05/17/10 | 05/18 | KPA-001 |
| S105009-09 | R1 | | Method Blank | 0.013 | 0.0500 | | | | | | | | | 05/17/10 | 05/18 | KPA-001 |
| S105009-13 | | | Duplicate (S105009-02) | 0.128 | 0.0500 | | | | | | | | 21 | 05/17/11 | 05/18 | KPA-001 |
| Nominal values and limits from method | | | | 1.00 | 0.0500 | | | | | | | | 180 | | | |

| PROCEDURES | REFERENCE | UTOT_KPA |
|---|---|---|
| | SPP-070 | Soil Dissolution, < 1.0g Aliquot, rev 1 |
| | SPP-044 | Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 0 |
| | CP-928 | Total Uranium by Kinetic Phosphorimetry, rev 11 |
| | CP-929 | Calibration of the Kinetic Phosphorimeter, rev 13 |

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.112 ± 0.087
YIELD _____ ± _____

Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/17/11

SDG 7858
Contact N.Joseph Verville

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

## SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.



Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/17/11

SDG 7858
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

# PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.



Lab id EBRLNE
Protocol RC-214
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/17/11

SDG 7858
Contact N.Joseph Verville

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

## WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.



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Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/17/11

SDG 7858
Contact N.Joseph Verville

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

## DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).



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# DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

SDG 7858
Contact N.Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

# DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.



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# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

## LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.



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Protocol RC-214
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REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

# DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.



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GUIDE, cont.

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Contract No. S00W235A00
Case no SDG K3346

## DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.



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# MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits



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GUIDE, cont.

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## MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.



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SDG 7858
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

# METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'



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## METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

# METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

## METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-21 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE K3346 (7858) | | SAF No.: RC-214 |
| Ice Chest No.: GWS-1910 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2586 | | Bill of Lading/Air Bill No.: 797052015907 ~~See OSRC~~ Zw. 5/2/11 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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~~ 125 gm 4-22-11 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - 8310 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | J1HHW9 | OTHER | | | | | | | | | | | | |
| 17 | J1HHX0 | OTHER | 4-27-11 | 0835 | | | | X | | | | | | |
| 18 | J1HHX1 | OTHER | | | | | | | | | | | | |
| 19 | J1HHX2 | OTHER | | | | | | | | | | | | |
| 20 | J1HHX3 | OTHER | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: [signature] | 4-28-11/0700 | SSU 1 | 4-28-11/0700 |
| Relinquished By/Removed From: SSU #1 | 5-2-11 1050 | M McCoy | 5-2-11 1050 |
| Relinquished By/Removed From: M McCoy | 5-2-11 1430 | Fed Ex | |
| Relinquished By/Removed From: FEDEX | | [signature] KELENSON | 5/3/11 10:30 |
| 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, Uranium, 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

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-22 | Page 1 of 1 |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER; Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C; Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE K3346 (7858) | SAF No.: RC-214 | |
| Ice Chest No.: GWS-1910 | Field Logbook No.: EL-1658; COA: BESCAS | Method of Shipment: FedEx | |
| Shipped To: EBERLINE SERVICES/ LIONVILLE | Offsite Property No.: 2586 | Bill of Lading/Air Bill No.: 797052015907 ~~See OSPC~~ DW 5/2/11 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potentiel Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 1 | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | ~~10~~mL 125 4-26-11 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - 8310 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | J1HHX4 | OTHER | 4/25/11 | 1345 | | | | | | | | | |
| 22 | J1HHX5 | OTHER | 4/26/11 | 0930 | | | | | | | | | |
| 23 | J1HHX6 | OTHER | 4/26/11 | 0935 | | | | | | | | | |
| 24 | J1HHX7 | OTHER | 4/26/11 | 0920 | | | | | | | | | |
| 25 | J1HHX8 | OTHER | 4/25/11 | 1415 | | | | X | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse KB Hulse | 4-26-11 1300 | SSU- 1 | 4-26-11 1300 |
| Relinquished By/Removed From: SSU#1 | 5-2-11 1050 | M McCoy | 5-2-11 1050 |
| Relinquished By/Removed From: M McCoy | 5-2-11 1430 | FedEx | |
| Relinquished By/Removed From: FEDEX | | Alex Kelenson / KELENSON | 10:30 5/3/11 |
| 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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-214-29 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C | Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH K3346 (7858) | | SAF No.: RC-214 | | |
| Ice Chest No.: GWS-1910 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx | | |
| Shipped To: EBERLINE SERVICES BLIONVILLE | Offsite Property No.: 2586 | | Bill of Lading/Air Bill No.: 797052015907 ~~See OSPC~~ LW 5/2/11 | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | ~~40mL~~ 125mL 4-26-11 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - 8310 | SPECIAL EXTRACTION - ASTM D3987 4-26-11 | Total Uranium | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J1HJ08 | OTHER | 0905 | 4/26/11 | | | | X | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From: SSU #1 | 5-2-11 1050 | M McCoy | 5-2-11 1050 |
| Relinquished By/Removed From: M McCoy | 5-2-11 1430 | Fed Ex | |
| Relinquished By/Removed From: FEDEX | | Received By/Stored In: Alex Kellerstof KECENSON | Date/Time: 5/3/11 10:30 |
| 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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-214-30 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH K3346 (7858) | | SAF No.: RC-214 |
| Ice Chest No.: GWS-1910 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES, LIONVILLE | Offsite Property No.: 2586 | | Bill of Lading/Air Bill No.: 7970 5201 5907 ~~See OSPC~~ LW. 5/2/11 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | |
|---|---|---|---|---|---|---|
| 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~~ 125 PS | 4.27-11 | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - 8310 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1HJ09 | OTHER | 4-27-11 | 0840 | | | | X | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**CHAIN OF POSSESSION**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| D Sparks | 4-28-11/0700 | SSU 1 | 4-28-11/0700 |
| SSU#1 | 1050 5-2-11 | M McCoy | 1050 5-2-11 |
| M McCoy | 1430 5-2-11 | Fed Ex | |
| FED EX | | Alex Kelleel KELENSON | 5/3/11 10:30 |
| | | | |
| | | | |

**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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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

EBERLINE

# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: U.P. C. HANFORD City RICHLAND State WA

Date/Time received 5/3/11 10:32 CoC No. RC-214-19, 21, 22, 24, 29-31

Container I.D. No. _____ Requested TAT (Days) _____ P.O. Received Yes [ ] No [ ]

### INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [ ] N/A ✓
6. Number of samples in shipping container: 7 Sample Matrix OTHER SOLID
7. Number of containers per sample: 1 (Or see CoC _____ )
8. Samples are in correct container Yes [✓] No [ ]
9. Paperwork agrees with samples? Yes [✓] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
11. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH _____ Preservative _____
13. Describe any anomalies:

_____

_____

_____

14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by JK Date: 5/3/11 Time: 10:45

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---|---|---|---|---|---|---|---|
| ALL Samples < 60 | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 24 Sep 2010

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

August 10, 2011

RECEIVED
AUG 2011

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A01**
**Eberline Analytical S1-07-099-7507, SDG K3346**

Dear Ms. Kessner:

Enclosed is the data report for eight leachate (water) samples designated under SAF No. RC-214, received at Eberline Analytical on June 22, 2011. The samples were analyzed according to the accompanying Lionville Laboratory Custody Transfer Record.

Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Client Services Manager

*NJV/*

*Enclosure: Data Package*

## 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3346 was composed of eight leachate (water) 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 documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on August 10, 2011

## 2.0 ANALYSIS NOTES

### 2.1 Total Uranium Analysis

An error was made generating the work plans for the leachate samples. An isotopic uranium analysis was performed instead of a total uranium analysis and unfortunately for each sample the entire received leach volume was consumed in the isotopic uranium analysis. To recover and generate results from the requested method the alpha spectrometry plates (planchets) were stripped of activity and reprocessed for total uranium. The stripped plates were recounted after stripping to determine if all activity was removed; all activity was successfully removed. The stripped activities were converted to the correct chemical form for total uranium analysis and analyzed. The original alpha spectrometry tracer yields were incorporated in the calculations of the total uranium results. No problems were encountered in the reprocessing of the samples.

## 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."**

N. Joseph Verville
**N. Joseph Verville**
**Client Services Manager**

8/10/11
**Date**

**E B E R L I N E  A N A L Y T I C A L / R I C H M O N D**
**SAMPLE DELIVERY GROUP K3346**

| | |
|---|---|
| SDG | 7507 |
| Contact | N. Joseph Verville |

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Case no | SDG_K3346 |

# S U M M A R Y  D A T A  S E C T I O N

## T A B L E  O F  C O N T E N T S


| | |
|---|---|
| About this section | 1 |
| Sample Summaries | 3 |
| Prep Batch Summary | 5 |
| Work Summary | 6 |
| Method Blanks | 8 |
| Lab Control Samples | 9 |
| Data Sheets | 10 |
| Method Summaries | 18 |
| Report Guides | 20 |
| End of Section | 34 |


Prepared by

Reviewed by

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-TOC |
| Version | 3.06 |
| Report date | 08/10/11 |

SDG 7507
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3346

# ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/10/11

# ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7507
Contact N. Joseph Verville

## LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| S106109-01 | J1HJ08-A1 | | WATER | | RC-214 | RC-214-29, 1105 | 04/26/11 09:05 |
| S106109-02 | J1HJ08-B1 | | WATER | | RC-214 | RC-214-29, 1105 | 04/26/11 09:05 |
| S106109-03 | J1HJ08-B2 | | WATER | | RC-214 | RC-214-29, 1105 | 04/26/11 09:05 |
| S106109-04 | J1HJ08-C1 | | WATER | | RC-214 | RC-214-29, 1105 | 04/26/11 09:05 |
| S106109-05 | J1HJ09-A1 | | WATER | | RC-214 | RC-214-30, 1105 | 04/27/11 08:40 |
| S106109-06 | J1HJ09-B1 | | WATER | | RC-214 | RC-214-30, 1105 | 04/27/11 08:40 |
| S106109-07 | J1HJ09-C1 | | WATER | | RC-214 | RC-214-30, 1105 | 04/27/11 08:40 |
| S106109-08 | J1HJ09-C2 | | WATER | | RC-214 | RC-214-30, 1105 | 04/27/11 08:40 |
| S106109-12 | Lab Control Sample | | WATER | | RC-214 | | |
| S106109-13 | Method Blank | | WATER | | RC-214 | | |



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7507
Contact N. Joseph Verville

## QC SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 7507 | RC-214-29, 1105 | J1HJ08-A1 | WATER | | 0.02 L | | 06/22/11 | 57 | S106109-01 | 7507-001 |
| | | J1HJ08-B1 | WATER | | 0.048 L | | 06/22/11 | 57 | S106109-02 | 7507-002 |
| | | J1HJ08-B2 | WATER | | 0.050 L | | 06/22/11 | 57 | S106109-03 | 7507-003 |
| | | J1HJ08-C1 | WATER | | 0.050 L | | 06/22/11 | 57 | S106109-04 | 7507-004 |
| | RC-214-30, 1105 | J1HJ09-A1 | WATER | | 0.006 L | | 06/22/11 | 56 | S106109-05 | 7507-005 |
| | | J1HJ09-B1 | WATER | | 0.048 L | | 06/22/11 | 56 | S106109-06 | 7507-006 |
| | | J1HJ09-C1 | WATER | | 0.050 L | | 06/22/11 | 56 | S106109-07 | 7507-007 |
| | | J1HJ09-C2 | WATER | | 0.050 L | | 06/22/11 | 56 | S106109-08 | 7507-008 |
| | | Method Blank | WATER | | | | | | S106109-13 | 7507-013 |
| | | Lab Control Sample | WATER | | | | | | S106109-12 | 7507-012 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7507
Contact N. Joseph Verville

## PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kinetic Phosphorimetry, ug | | | | | | | | | | | | |
| U_T | WATER | Uranium, Total in Water | 7296-080 | | 8 | | | 1 | 1 | | | |

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7507
Contact N. Joseph Verville

## LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

| LAB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| S106109-01 04/26/11 06/22/11 | J1HJ08-A1 RC-214-29, 1105 RC-214 | | WATER | 7507-001 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-02 04/26/11 06/22/11 | J1HJ08-B1 RC-214-29, 1105 RC-214 | | WATER | 7507-002 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-03 04/26/11 06/22/11 | J1HJ08-B2 RC-214-29, 1105 RC-214 | | WATER | 7507-003 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-04 04/26/11 06/22/11 | J1HJ08-C1 RC-214-29, 1105 RC-214 | | WATER | 7507-004 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-05 04/27/11 06/22/11 | J1HJ09-A1 RC-214-30, 1105 RC-214 | | WATER | 7507-005 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-06 04/27/11 06/22/11 | J1HJ09-B1 RC-214-30, 1105 RC-214 | | WATER | 7507-006 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-07 04/27/11 06/22/11 | J1HJ09-C1 RC-214-30, 1105 RC-214 | | WATER | 7507-007 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-08 04/27/11 06/22/11 | J1HJ09-C2 RC-214-30, 1105 RC-214 | | WATER | 7507-008 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |
| S106109-12 | Lab Control Sample | RC-214 | WATER | 7507-012 | U_T | | 07/29/11 | 07/29/11 | CSS | Uranium, Total in Water |
| S106109-13 | Method Blank | RC-214 | WATER | 7507-013 | U_T | | 07/28/11 | 07/28/11 | CSS | Uranium, Total in Water |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

SDG 7507
Contact N. Joseph Verville

## WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

### COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| U_T | RC-214 | Uranium, Total in Water | UTOT_KPA | 8 | | | 1 | 1 | | 10 |
| TOTALS | | | | 8 | | | 1 | 1 | | 10 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-013 Method Blank

## METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S106109-13 | Client sample id | Method Blank | | |
| Dept sample id | 7507-013 | Material/Matrix | | WATER | |
| | | SAF No | RC-214 | | |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 0 | 0.015 | 0.034 | 1.00 | U | U_T |

QC-BLANK #79145

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-012

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7507

Contact N. Joseph Verville

Client/Case no Hanford SDG K3346

Contract No. S00W235A00

Lab sample id S106109-12

Dept sample id 7507-012

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No RC-214

| ANALYTE | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST | ADDED ug/L | 2σ ERR ug/L | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Uranium | 92.5 | 11 | 0.340 | 1.00 | | U_T | 90.5 | 3.6 | 102 | 81-119 | 80-120 |

QC-LCS #79144

Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 08/10/11

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-001 J1HJ08-A1

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S106109-01 | Client sample id | J1HJ08-A1 | |
| Dept sample id | 7507-001 | Location/Matrix | | WATER |
| Received | 06/22/11 | Collected/Volume | 04/26/11 09:05 0.02 L | |
| | | Custody/SAF No | RC-214-29, 1105 RC-214 | |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 0.056 | 0.019 | 0.039 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

7507-002 J1HJ08-B1

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S106109-02 | Client sample id | J1HJ08-B1 | | |
| Dept sample id | 7507-002 | Location/Matrix | | WATER | |
| Received | 06/22/11 | Collected/Volume | 04/26/11 09:05 | 0.048 L | |
| | | Custody/SAF No | RC-214-29, 1105 | RC-214 | |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 0.050 | 0.012 | 0.019 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-003 J1HJ08-B2

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S106109-03 | Client sample id | J1HJ08-B2 | |
| Dept sample id | 7507-003 | Location/Matrix | | WATER |
| Received | 06/22/11 | Collected/Volume | 04/26/11 09:05 | 0.050 L |
| | | Custody/SAF No | RC-214-29, 1105 | RC-214 |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 0.046 | 0.011 | 0.019 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-004 J1HJ08-C1

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S106109-04 | Client sample id | J1HJ08-C1 | | |
| Dept sample id | 7507-004 | Location/Matrix | | WATER | |
| Received | 06/22/11 | Collected/Volume | 04/26/11 09:05 | 0.050 L | |
| | | Custody/SAF No | RC-214-29, 1105 | RC-214 | |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 0.098 | 0.014 | 0.016 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-005 J1HJ09-A1

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S106109-05 | Client sample id | J1HJ09-A1 | |
| Dept sample id | 7507-005 | Location/Matrix | | WATER |
| Received | 06/22/11 | Collected/Volume | 04/27/11 08:40 | 0.006 L |
| | | Custody/SAF No | RC-214-30, 1105 | RC-214 |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 6.42 | 0.73 | 0.133 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

**SAMPLE DELIVERY GROUP K3346**

**7507-006** **J1HJ09-B1**

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 | |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | | |
| Lab sample id | S106109-06 | Client sample id | J1HJ09-B1 | | |
| Dept sample id | 7507-006 | Location/Matrix | | WATER | |
| Received | 06/22/11 | Collected/Volume | 04/27/11 08:40 | 0.048 L | |
| | | Custody/SAF No | RC-214-30, 1105 | RC-214 | |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 3.35 | 0.38 | 0.018 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-007 J1HJ09-C1

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S106109-07 | Client sample id | J1HJ09-C1 | |
| Dept sample id | 7507-007 | Location/Matrix | | WATER |
| Received | 06/22/11 | Collected/Volume | 04/27/11 08:40 | 0.050 L |
| | | Custody/SAF No | RC-214-30, 1105 | RC-214 |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 2.27 | 0.26 | 0.016 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

7507-008 J1HJ09-C2

## DATA SHEET

| | | | | |
|---|---|---|---|---|
| SDG | 7507 | Client/Case no | Hanford | SDG_K3346 |
| Contact | N. Joseph Verville | Contract | No. S00W235A00 | |
| Lab sample id | S106109-08 | Client sample id | J1HJ09-C2 | |
| Dept sample id | 7507-008 | Location/Matrix | | WATER |
| Received | 06/22/11 | Collected/Volume | 04/27/11 08:40 | 0.050 L |
| | | Custody/SAF No | RC-214-30, 1105 | RC-214 |

| ANALYTE | CAS NO | RESULT ug/L | 2σ ERR (COUNT) | MDA ug/L | RDL ug/L | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Total Uranium | 7440-61-1 | 2.44 | 0.28 | 0.019 | 1.00 | | U_T |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

| | |
|---|---|
| Test U T | Matrix WATER |
| SDG 7507 | |
| Contact N. Joseph Verville | |

## LAB METHOD SUMMARY

URANIUM, TOTAL IN WATER

KINETIC PHOSPHORIMETRY, UG

| | |
|---|---|
| Client Hanford | |
| Contract No. S00W235A00 | |
| Contract SDG K3346 | |

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Total Uranium |
|---|---|---|---|---|---|
| Preparation batch 7296-080 | | | | | |
| S106109-01 | | | 7507-001 | J1HJ08-A1 | 0.056 |
| S106109-02 | | | 7507-002 | J1HJ08-B1 | 0.050 |
| S106109-03 | | | 7507-003 | J1HJ08-B2 | 0.046 |
| S106109-04 | | | 7507-004 | J1HJ08-C1 | 0.098 |
| S106109-05 | | | 7507-005 | J1HJ09-A1 | 6.42 |
| S106109-06 | | | 7507-006 | J1HJ09-B1 | 3.35 |
| S106109-07 | | | 7507-007 | J1HJ09-C1 | 2.27 |
| S106109-08 | | | 7507-008 | J1HJ09-C2 | 2.44 |
| S106109-12 | | | 7507-012 | Lab Control Sample | ok |
| S106109-13 | | | 7507-013 | Method Blank | U |
| Nominal values and limits from method | | | | RDLs (ug/L) | 1.00 |

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA ug/L | ALIQ L | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 7296-080 | | | 2σ prep error | | Reference Lab Notebook 7296 pg. 80 | | | | | | | | | | | |
| S106109-01 | | | J1HJ08-A1 | 0.039 | 0.0175 | | | | | | | | 93 | 07/28/11 | 07/28 | KPA-001 |
| S106109-02 | | | J1HJ08-B1 | 0.019 | 0.0357 | | | | | | | | 93 | 07/28/11 | 07/28 | KPA-001 |
| S106109-03 | | | J1HJ08-B2 | 0.019 | 0.0351 | | | | | | | | 93 | 07/28/11 | 07/28 | KPA-001 |
| S106109-04 | | | J1HJ08-C1 | 0.016 | 0.0418 | | | | | | | | 93 | 07/28/11 | 07/28 | KPA-001 |
| S106109-05 | | | J1HJ09-A1 | 0.133 | 0.0051 | | | | | | | | 92 | 07/28/11 | 07/28 | KPA-001 |
| S106109-06 | | | J1HJ09-B1 | 0.018 | 0.0385 | | | | | | | | 92 | 07/28/11 | 07/28 | KPA-001 |
| S106109-07 | | | J1HJ09-C1 | 0.016 | 0.0438 | | | | | | | | 92 | 07/28/11 | 07/28 | KPA-001 |
| S106109-08 | | | J1HJ09-C2 | 0.019 | 0.0366 | | | | | | | | 92 | 07/28/11 | 07/28 | KPA-001 |
| S106109-12 | | | Lab Control Sample | 0.340 | 0.0200 | | | | | | | | | 07/29/11 | 07/29 | KPA-001 |
| S106109-13 | | | Method Blank | 0.034 | 0.0200 | | | | | | | | | 07/28/11 | 07/28 | KPA-001 |
| Nominal values and limits from method | | | | 1.00 | 0.0200 | | | | | | | | 180 | | | |



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 08/10/11 |

# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

| | |
|---|---|
| Test U T Matrix WATER | Client Hanford |
| SDG 7507 | Contract No. S00W235A00 |
| Contact N. Joseph Verville | Contract SDG K3346 |

## LAB METHOD SUMMARY, cont.

URANIUM, TOTAL IN WATER

KINETIC PHOSPHORIMETRY, UG

| PROCEDURES | REFERENCE | UTOT_KPA |
|---|---|---|
| | CP-929 | Calibration of the Kinetic Phosphorimeter, rev 13 |
| | SPP-044 | Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 0 |
| | CP-928 | Total Uranium by Kinetic Phosphorimetry, rev 11 |

| | | |
|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.065 ± 0.206 |
| FOR 10 SAMPLES | YIELD | ____ ± ____ |



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
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# EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3346

| | |
|---|---|
| SDG | 7507 |
| Contact | N. Joseph Verville |

## REPORT GUIDE

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Case no | SDG K3346 |

## SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-RG |
| Version | 3.06 |
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Client Hanford
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Case no SDG_K3346

# PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.



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# WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.



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# REPORT GUIDE

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## DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).



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If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

| | | |
|---|---|---|
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* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3346

## LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.



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# DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

## DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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Case no SDG K3346

## MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits



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# MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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# METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

## METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

# METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

## METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#: Pg 1
Lionville Laboratory Project Manager: Arlette Johnson
QC: Del: TAT:
Date Rec'd: 5-3-11 Date Due:

| Refrigerator # | | A-D | | | | 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #/Type Container | Liquid | | | | | | | | | | | | | | |
| | Solid | | | | | 4pl | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | | | | | 1L | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | INORG | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Special Extra | | | Metal | CN | Leachate | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

SDG# K3346 (7507)

| | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 8260/11 | | | 6010 RCRA+4 | | | TCLP RCRA+4 | Uranium | |
| | 11 | JIHHX0-3 | | other | SO | 4-27-11 | 0835 | | | | | X | | X | | | | | |
| | 12 | 4 | | | | | | | | | | X | | X | | | | | |
| | 13 | JIHHX8-1 | | | S | 4-25-11 | 1415 | | | | | X | | X | | | | | |
| | 14 | 2 | | | | | | | | | | X | | X | | | | | |
| | 15 | 3 | | | | | | | | | | X | | X | | | | | |
| | 16 | 4 | | | | | | | | | | X | | X | | | | | |
| ✓ | 17 | JIH508-A1 | | | | 4-26-11 | 0905 | | | | | | | | | | X | X | |
| ✓ | 18 | B1 | | | | | | | | | | | | | | | X | X | |
| ✓ | 19 | B2 | | | | | | | | | | | | | | | X | X | |
| ✓ | 20 | C1 | | | | | | | | | | | | | | | X | X | |

Special Instructions:

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | UPS | 6/21/11 | |
| UPS | [illegible] | 06/22/11 | 09 [illegible] |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

Lionville Laboratory Use Only
1105007

# Custody Transfer Record/Lab Work Request



FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC HANFORD RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#: Pg 1
Lionville Laboratory Project Manager:
QC: 5 Del: TAT:
Date Rec'd: 5-3-11 Date Due:

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →

| ORGANIC | | | | INORG | | | |
|---|---|---|---|---|---|---|---|
| VOA | BNA | Pest/PCB | Herb | Metal | CN | Leachate | URANIUM |

SDG # K3346 (7507)

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil ✓
SL Sludge
SE Sediment
PC Paint Chips ✓
O Oil
NAL Non-Aqueous Liquid ✓
L Leachate ✓
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only: TCLP RCRA 4 | |
|---|---|---|---|---|---|---|---|---|
| 21 | JHJ09-A1 | | | Oily Solid | 4-27-11 | 0840 | X | X |
| 22 | B1 | | | | | | X | X |
| 23 | C1 | | | | | | X | X |
| 24 | C2 | | | | | | X | X |
| 25 | JHHX0-A1 | | | | | 0835 | X | |
| 26 | A2 | | | | | | X | |
| 27 | B1 | | | | | | X | |
| 28 | C1 | | | | | | X | |
| 29 | JHHX8-A1 | | | | 4-25-11 | 1415 | X | |
| 30 | B1 | | | | | | X | |

Special Instructions:

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | UPS | [illegible]/11 | |
| UPS | [illegible] | 06/27/11 | 0930 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

RECEIVED
MAY 2011

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | Reported:<br>05/09/2011 08:50 |

## Analytical Report for Semivolatile Organic Compounds by SW846 8270C

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1HJ08 | 1105004-01 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09 | 1105004-02 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HHX0 | 1105004-04 | Other Solid | 04/27/2011 08:35 | 05/03/2011 10:50 |
| J1HHX8 | 1105004-10 | Other Solid | 04/25/2011 14:15 | 05/03/2011 10:50 |

LIONVILLE LABORATORY
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Phone (610) 280-3000
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# Case Narrative

**Client:** WC-HANFORD RC-214 K3346
**LVL #:** 1105004

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 05-03-2011

## SEMIVOLATILE

Four (4) other solid samples were collected on 04-25,26,27-2011.

The samples and associated QC samples were extracted 05-04-2011 and analyzed 05-05-2011 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. One (1) of forty-eight (48) obtainable surrogate recoveries was outside acceptance criteria. The surrogate recovery criteria were not met for sample J1HHX8. The recovery of the compound 2,4,6 Tribromophenol was just below QC acceptance criteria. Other acid surrogates were low; however, they were within acceptance criteria. Low surrogate recovery may be due to matrix effects.
5. The method blank was below the reporting limit for all target compounds.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The samples were reported on a wet weight 'as received' basis.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
11. Internal standard area and retention time criteria were met.


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 20 pages.

12. 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").

13. 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

5/9/11
Date

# GLOSSARY

## DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concetration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

| | | |
|---|---|---|
| MP | - | Missed Peak: Manually added peak not found by automatic quan program. |
| PA | - | Peak Assignment: quan report was changed to reflect correct peak assignment. |
| RI | - | Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column. |
| SP | - | Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area. |
| CB | - | Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal., or other interference. |
| PI | - | Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually. |

# GLOSSARY

## ABBREVIATIONS

| | | |
|---|---|---|
| **BS** | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| **BSD** | = | Indicates blank spike duplicate. |
| **MS** | = | Indicates matrix spike. |
| **MSD** | = | Indicates matrix spike duplicate. |
| **DL** | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| **NA** | = | Not Applicable. |
| **DF** | = | Dilution Factor. |
| **NR** | = | Not Required. |
| **SP, Z** | = | Indicates Spiked Compound. |

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.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | Reported:<br>05/09/2011 08:50 |

## J1HJ08
### 1105004-01 (Other Solid)

| 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 | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Acenaphthylene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Anthracene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benz[a]anthracene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[a] pyrene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[b] fluoranthene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[g,h,i] perylene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[k] fluoranthene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Chrysene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Dibenz[a,h]anthracene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluoranthene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluorene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Indeno[1,2,3-cd]pyrene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Naphthalene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Phenanthrene** | **119** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Pyrene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Unknown 1** | **14400** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Unknown 2** | **1450** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Aldol Condensate 1** | **2460** | A, J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Aldol Condensate 2** | **74300** | A, B, J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 1** | **1470** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| *Surrogate: 2-Fluorophenol* | *75 %* | | *25-121* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Phenol-d5* | *76 %* | | *24-113* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *80 %* | | *23-120* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *91 %* | | *30-115* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *66 %* | | *19-122* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *103 %* | | *18-137* | | | *L105061* | *05/04/2011* | *05/05/2011* | *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: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/09/2011 08:50 |

## J1HJ09

### 1105004-02 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | | |
| Acenaphthene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Acenaphthylene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Anthracene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benz[a]anthracene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[a] pyrene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[b] fluoranthene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[g,h,i] perylene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[k] fluoranthene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Chrysene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Dibenz[a,h]anthracene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluoranthene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluorene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Indeno[1,2,3-cd]pyrene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Naphthalene** | **234** | J | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Phenanthrene** | **90.3** | J | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Pyrene | 327 | U | 327 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:PAH 2** | **6770** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:PAH 1** | **9820** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 1** | **4790** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Aldol Condensate 1** | **46600** | A, B, J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Unknown 1** | **8790** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| *Surrogate: 2-Fluorophenol* | *46 %* | | *25-121* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Phenol-d5* | *52 %* | | *24-113* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *66 %* | | *23-120* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *77 %* | | *30-115* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *50 %* | | *19-122* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *101 %* | | *18-137* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |

1SU 144

Lionville Laboratory Use Only

1105007

# Custody Transfer Record/Lab Work Request

Page 1 of 4

Lionville Laboratory
A Division of Eberline Analytical Corporation

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC. Hanford SAFA RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Alletta Johnson
QC: SW Del: STD TAT: 21 Days

Date Rec'd: 5-3-11 Date Due: 5-24-11

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | | A-D 2 | | | | | | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | | |
| | Solid | | | | | | 4pl | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | | |
| | Solid | | | | | | 1L | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | | Acid Extract | | INORG: Metal | CN | | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | | |
| | | | | | | | | 6010 RCRA + Li | | | | | | | | | |

SDG# K3346

MATRIX CODES: W Water, WW Waste Water, GW Groundwater, WST Waste, WI Wipe, SO Solid, S Soil, SL Sludge, SE Sediment, PC Paint Chips, O Oil, NAL Non-Aqueous Liquid, L Leachate, A Air, T Tissue, F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1HJ08-1 | | | * OTHER SOIL | 4-26-11 | 0905 | | | | | X | | X | | | | | |
| 02 | 2 | | | | | | | | | | X | | X | | | | | |
| 03 | 3 | | | | | | | | | | X | | X | | | | | |
| 04 | 4 | | | | | | | | | | X | | X | | | | | |
| 05 | J1HJ09-1 | | | | 4-27-11 | 0840 | | | | | X | | X | | | | | |
| 06 | 2 | | | | | | | | | | X | | X | | | | | |
| 07 | 3 | | | | | | | | | | X | | X | | | | | |
| 08 | 4 | | | | | | | | | | X | | X | | | | | |
| 09 | J1HHX0-1 | | | | 4-27-11 | ~~0855~~ 0835 | 5/5/11 | | | | X | (2) | X | | | | | |
| 10 | 2 | | | | | | | | | | X | | X | | | | | |

Special Instructions: Caution Potential Beryllium Contamination

Special Instructions:
1. * Matrix (Soil) = Ash.
2. 5/6/11 samples in for Total + TCLP RCRA 6010 + Li - only (no Hg)
3.
4.
5.
6.

See SRF

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| [illegible] | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| V. Hernandez | UPS | 6/21/11 | |
| UPS | [illegible] | 06/22/11 | 0930 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | | |

| Lionville Laboratory Use Only |
|---|
| 1105007 |

# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC HANFORD RC-214
Est. Final Proj. Sampling Date:
Project#: Pg 1
Project Contact/Phone#:
Lionville Laboratory Project Manager:
QC: Del: TAT:

Date Rec'd: 5-3-11 Date Due:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Leachates

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Leachates (Lionville Laboratory Use Only) |
|---|---|---|---|---|---|---|---|
| | 8DG4 R3346 | | | | | | TCLP REPAIR |
| 31 | J1HH8-B2 | | | Other Solid | 4-25-11 | 1415 | X |
| 32 | 2 C1 | | | 1 | 1 | 1 | X |

Special Instructions:

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| UPS | [illegible] | 06/22/11 | 0930 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

EBERLINE SERVICE

# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: W-CHANFORD/LIONVILLE City: RICHLAND State: WA

Date/Time received: 06/27/11 0930 CoC No. RC 214

Container I.D. No. Box Requested TAT (Days) — P.O. Received Yes [ ] No [ ]

### INSPECTION

1. Custody seals on shipping container intact? Yes [ ] No [ ] N/A [X]
2. Custody seals on shipping container dated & signed? Yes [ ] No [ ] N/A [X]
3. Custody seals on sample containers intact? Yes [ ] No [ ] N/A [X]
4. Custody seals on sample containers dated & signed? Yes [ ] No [ ] N/A [X]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 8 Sample Matrix L
7. Number of containers per sample: 1 (Or see CoC _____ )
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ] SEE NOTE
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [ ]
11. Samples are: In good condition [ ] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH _____ Preservative _____
13. Describe any anomalies:
    NOTE: DATE ON LABEL IS 05/16/11
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by [illegible] Date: 06/27/11 Time: 1100

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---|---|---|---|---|---|---|---|
| ALL SAMPLES | LBD | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100048V Calibration date 26 SEP 10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

10 May 2011

RECEIVED
MAY 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1105004 |
| SDG # | K3346 |
| SAF # | RC-214 |
| Date Received | 05/03/11 |
| # Samples | 10 |
| Matrix | OTHER SOLID |
| Volatiles | |
| Semivolatiles | X |
| Pest/PCB | |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | |
| Metals | X |
| Inorganics | |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

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: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/09/2011 08:50 |

## J1HHX0

### 1105004-04 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by SW846 8270C** | | | | | | | | | |
| Acenaphthene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Acenaphthylene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Anthracene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benz[a]anthracene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[a] pyrene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[b] fluoranthene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[g,h,i] perylene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[k] fluoranthene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Chrysene** | **65.0** | J | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Dibenz[a,h]anthracene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Fluoranthene** | **78.0** | J | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluorene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Indeno[1,2,3-cd]pyrene | 324 | U | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Naphthalene** | **852** | | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Phenanthrene** | **164** | J | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Pyrene** | **69.4** | J | 324 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:PAH 2** | **4480** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Unknown 1** | **5640** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Aldol Condensate 1** | **54800** | A, B, J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:PAH 1** | **11300** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 1** | **5490** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| *Surrogate: 2-Fluorophenol* | *58 %* | | *25-121* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Phenol-d5* | *71 %* | | *24-113* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *81 %* | | *23-120* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *91 %* | | *30-115* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *42 %* | | *19-122* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *112 %* | | *18-137* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | Reported:<br>05/09/2011 08:50 |

## J1HHX8

### 1105004-10 (Other Solid)

| 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 | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Acenaphthylene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Anthracene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Benz[a]anthracene** | **73.6** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[a] pyrene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[b] fluoranthene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Benzo[g,h,i] perylene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Benzo[k] fluoranthene** | **83.9** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Chrysene** | **83.4** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Dibenz[a,h]anthracene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Fluoranthene** | **74.9** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Fluorene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| Indeno[1,2,3-cd]pyrene | 328 | U | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Naphthalene** | **1730** | | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Phenanthrene** | **393** | | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **Pyrene** | **100** | J | 328 | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 4** | **15100** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 3** | **23000** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 2** | **15200** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Alkane 1** | **13500** | J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| **TIC:Aldol Condensate 1** | **77200** | A, B, J | | ug/kg wet | 1 | L105061 | 05/04/2011 | 05/05/2011 | 8270C |
| *Surrogate: 2-Fluorophenol* | *25 %* | | *25-121* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Phenol-d5* | *39 %* | | *24-113* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: Nitrobenzene-d5* | *84 %* | | *23-120* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2-Fluorobiphenyl* | *96 %* | | *30-115* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: 2,4,6-Tribromophenol* | *17 % ** | | *19-122* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |
| *Surrogate: p-Terphenyl-d14* | *117 %* | | *18-137* | | | *L105061* | *05/04/2011* | *05/05/2011* | *8270C* |

LIONVILLE LABORATORY
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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/09/2011 08:50 |

## 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 L105061 - SW 3540C** | | | | | | | | | |
| **Blank (L105061-BLK1)** | | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Acenaphthene | 330 U | 330 | ug/kg wet | | | | | | |
| Acenaphthylene | 330 U | 330 | ug/kg wet | | | | | | |
| Anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Benz[a]anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[a] pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[b] fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[g,h,i] perylene | 330 U | 330 | ug/kg wet | | | | | | |
| Benzo[k] fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Chrysene | 330 U | 330 | ug/kg wet | | | | | | |
| Dibenz[a,h]anthracene | 330 U | 330 | ug/kg wet | | | | | | |
| Fluoranthene | 330 U | 330 | ug/kg wet | | | | | | |
| Fluorene | 330 U | 330 | ug/kg wet | | | | | | |
| Indeno[1,2,3-cd]pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Naphthalene | 330 U | 330 | ug/kg wet | | | | | | |
| Phenanthrene | 330 U | 330 | ug/kg wet | | | | | | |
| Pyrene | 330 U | 330 | ug/kg wet | | | | | | |
| Unknown 2 TIC | 2540 J | | ug/kg wet | | | | | | |
| Unknown 1 | 2650 J | | ug/kg wet | | | | | | |
| Trichloro-1-propene | 8760 J | | ug/kg wet | | | | | | |
| Aldol Condensate 1 | 69000 A, J | | ug/kg wet | | | | | | |
| Aldol Condensate 2 | 6230 A, J | | ug/kg wet | | | | | | |
| *Surrogate: 2-Fluorophenol* | *2000* | | *ug/kg wet* | *2500.0* | | *80* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2170* | | *ug/kg wet* | *2500.0* | | *87* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *835* | | *ug/kg wet* | *1666.7* | | *50* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1620* | | *ug/kg wet* | *1666.7* | | *97* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2020* | | *ug/kg wet* | *2500.0* | | *81* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1690* | | *ug/kg wet* | *1666.7* | | *102* | *18-137* | | |

L Bu 5/9/11

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/09/2011 08:50 |

## 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 L105061 - SW 3540C** | | | | | | | | | |
| **LCS (L105061-BS1)** | | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Acenaphthene | 1600 | 330 | ug/kg wet | 2000.0 | | 80 | 45-110 | | 40 |
| Acenaphthylene | 1490 | 330 | ug/kg wet | 2000.0 | | 75 | 45-115 | | 40 |
| Anthracene | 1580 | 330 | ug/kg wet | 2000.0 | | 79 | 45-130 | | 40 |
| Benz[a]anthracene | 1650 | 330 | ug/kg wet | 2000.0 | | 82 | 45-130 | | 40 |
| Benzo[a] pyrene | 1430 | 330 | ug/kg wet | 2000.0 | | 72 | 45-130 | | 20 |
| Benzo[b] fluoranthene | 1670 | 330 | ug/kg wet | 2000.0 | | 84 | 40-130 | | 20 |
| Benzo[g,h,i] perylene | 1650 | 330 | ug/kg wet | 2000.0 | | 82 | 45-125 | | 20 |
| Benzo[k] fluoranthene | 1540 | 330 | ug/kg wet | 2000.0 | | 77 | 45-125 | | 20 |
| Chrysene | 1680 | 330 | ug/kg wet | 2000.0 | | 84 | 45-130 | | 40 |
| Dibenz[a,h]anthracene | 1610 | 330 | ug/kg wet | 2000.0 | | 81 | 45-125 | | 40 |
| Fluoranthene | 1690 | 330 | ug/kg wet | 2000.0 | | 85 | 45-130 | | 40 |
| Fluorene | 1680 | 330 | ug/kg wet | 2000.0 | | 84 | 45-120 | | 40 |
| Indeno[1,2,3-cd]pyrene | 1610 | 330 | ug/kg wet | 2000.0 | | 80 | 45-130 | | 40 |
| Naphthalene | 1370 | 330 | ug/kg wet | 2000.0 | | 68 | 40-110 | | 40 |
| Phenanthrene | 1700 | 330 | ug/kg wet | 2000.0 | | 85 | 50-120 | | 40 |
| Pyrene | 1600 | 330 | ug/kg wet | 2000.0 | | 80 | 45-125 | | 40 |
| *Surrogate: 2-Fluorophenol* | *2000* | | *ug/kg wet* | *2500.0* | | *80* | *25-121* | | |
| *Surrogate: Phenol-d5* | *1900* | | *ug/kg wet* | *2500.0* | | *76* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1150* | | *ug/kg wet* | *1666.7* | | *69* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1590* | | *ug/kg wet* | *1666.7* | | *95* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *1980* | | *ug/kg wet* | *2500.0* | | *79* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1450* | | *ug/kg wet* | *1666.7* | | *87* | *18-137* | | |
| **Matrix Spike (L105061-MS1)** | | **Source: 1105004-01** | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Acenaphthene | 2030 | 328 | ug/kg wet | 1986.1 | 328 U | 102 | 45-110 | | 40 |
| Acenaphthylene | 2070 | 328 | ug/kg wet | 1986.1 | 328 U | 104 | 45-115 | | 40 |
| Anthracene | 2020 | 328 | ug/kg wet | 1986.1 | 328 U | 102 | 45-130 | | 40 |
| Benz[a]anthracene | 1980 | 328 | ug/kg wet | 1986.1 | 328 U | 100 | 45-130 | | 40 |
| Benzo[a] pyrene | 1680 | 328 | ug/kg wet | 1986.1 | 328 U | 85 | 45-130 | | 20 |
| Benzo[b] fluoranthene | 1810 | 328 | ug/kg wet | 1986.1 | 328 U | 91 | 40-130 | | 20 |
| Benzo[g,h,i] perylene | 1470 | 328 | ug/kg wet | 1986.1 | 328 U | 74 | 45-125 | | 20 |
| Benzo[k] fluoranthene | 1890 | 328 | ug/kg wet | 1986.1 | 328 U | 95 | 45-125 | | 20 |
| Chrysene | 1980 | 328 | ug/kg wet | 1986.1 | 328 U | 100 | 45-130 | | 40 |
| Dibenz[a,h]anthracene | 1720 | 328 | ug/kg wet | 1986.1 | 328 U | 87 | 45-125 | | 40 |
| Fluoranthene | 1950 | 328 | ug/kg wet | 1986.1 | 328 U | 98 | 45-130 | | 40 |
| Fluorene | 2140 | 328 | ug/kg wet | 1986.1 | 328 U | 108 | 45-120 | | 40 |
| Indeno[1,2,3-cd]pyrene | 1580 | 328 | ug/kg wet | 1986.1 | 328 U | 80 | 45-130 | | 40 |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/09/2011 08:50 |

## 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 L105061 - SW 3540C** | | | | | | | | | |
| **Matrix Spike (L105061-MS1)** | | **Source: 1105004-01** | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Naphthalene | 1860 | 328 | ug/kg wet | 1986.1 | 328 U | 94 | 40-110 | | 40 |
| Phenanthrene | 2200 | 328 | ug/kg wet | 1986.1 | 119 | 105 | 50-120 | | 40 |
| Pyrene | 2000 | 328 | ug/kg wet | 1986.1 | 328 U | 101 | 45-125 | | 40 |
| *Surrogate: 2-Fluorophenol* | *2200* | | *ug/kg wet* | *2482.6* | | *88* | *25-121* | | |
| *Surrogate: Phenol-d5* | *2340* | | *ug/kg wet* | *2482.6* | | *94* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1520* | | *ug/kg wet* | *1655.1* | | *92* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1750* | | *ug/kg wet* | *1655.1* | | *106* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *2580* | | *ug/kg wet* | *2482.6* | | *104* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1970* | | *ug/kg wet* | *1655.1* | | *119* | *18-137* | | |
| **Matrix Spike Dup (L105061-MSD1)** | | **Source: 1105004-01** | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Acenaphthene | 1730 | 328 | ug/kg wet | 1987.4 | 328 U | 87 | 45-110 | 16 | 40 |
| Acenaphthylene | 1790 | 328 | ug/kg wet | 1987.4 | 328 U | 90 | 45-115 | 15 | 40 |
| Anthracene | 1790 | 328 | ug/kg wet | 1987.4 | 328 U | 90 | 45-130 | 13 | 40 |
| Benz[a]anthracene | 1690 | 328 | ug/kg wet | 1987.4 | 328 U | 85 | 45-130 | 16 | 40 |
| Benzo[a] pyrene | 1390 | 328 | ug/kg wet | 1987.4 | 328 U | 70 | 45-130 | 19 | 20 |
| Benzo[b] fluoranthene | 1470 | 328 | ug/kg wet | 1987.4 | 328 U | 74 | 40-130 | 21* | 20 |
| Benzo[g,h,i] perylene | 1110 | 328 | ug/kg wet | 1987.4 | 328 U | 56 | 45-125 | 28* | 20 |
| Benzo[k] fluoranthene | 1690 | 328 | ug/kg wet | 1987.4 | 328 U | 85 | 45-125 | 11 | 20 |
| Chrysene | 1680 | 328 | ug/kg wet | 1987.4 | 328 U | 85 | 45-130 | 16 | 40 |
| Dibenz[a,h]anthracene | 1360 | 328 | ug/kg wet | 1987.4 | 328 U | 68 | 45-125 | 24 | 40 |
| Fluoranthene | 1780 | 328 | ug/kg wet | 1987.4 | 328 U | 90 | 45-130 | 9 | 40 |
| Fluorene | 1850 | 328 | ug/kg wet | 1987.4 | 328 U | 93 | 45-120 | 15 | 40 |
| Indeno[1,2,3-cd]pyrene | 1220 | 328 | ug/kg wet | 1987.4 | 328 U | 62 | 45-130 | 26 | 40 |
| Naphthalene | 1670 | 328 | ug/kg wet | 1987.4 | 328 U | 84 | 40-110 | 11 | 40 |
| Phenanthrene | 1850 | 328 | ug/kg wet | 1987.4 | 119 | 87 | 50-120 | 18 | 40 |
| Pyrene | 1730 | 328 | ug/kg wet | 1987.4 | 328 U | 87 | 45-125 | 14 | 40 |
| *Surrogate: 2-Fluorophenol* | *1880* | | *ug/kg wet* | *2484.3* | | *76* | *25-121* | | |
| *Surrogate: Phenol-d5* | *1940* | | *ug/kg wet* | *2484.3* | | *78* | *24-113* | | |
| *Surrogate: Nitrobenzene-d5* | *1320* | | *ug/kg wet* | *1656.2* | | *80* | *23-120* | | |
| *Surrogate: 2-Fluorobiphenyl* | *1440* | | *ug/kg wet* | *1656.2* | | *87* | *30-115* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *1880* | | *ug/kg wet* | *2484.3* | | *76* | *19-122* | | |
| *Surrogate: p-Terphenyl-d14* | *1620* | | *ug/kg wet* | *1656.2* | | *98* | *18-137* | | |

# PREPARATION BENCH SHEET

L105061

**Lionville Laboratory**

**Printed: 5/5/2011 2:50:52PM**

**Matrix: Solid** **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1100089**

| Lab Number | Analysis | Prepared | Initial (g) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1105004-01 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.17 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105004-02 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.27 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105004-04 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.56 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105004-10 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.21 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105005-02 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.76 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105005-04 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 31.35 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105005-05 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.72 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| 1105005-14 | 8270C SVOC (Client List) | 05/04/2011 15:54 | 30.19 | 1 | | | | 500 | WC-Hanford, Inc. | PAH LIST |
| L105061-BLK1 | QC | 05/04/2011 15:54 | 30 | 1 | | | | 500 | | |
| L105061-BS1 | QC | 05/04/2011 15:54 | 30 | 1 | 1100143 | | 600 | 500 | | |
| L105061-MS1 | QC | 05/04/2011 15:54 | 30.21 | 1 | 1100143 | 1105004-01 | 600 | 500 | | |
| L105061-MS2 | QC | 05/04/2011 15:54 | 30.91 | 1 | 1100143 | 1105005-14 | 600 | 500 | | |
| L105061-MSD1 | QC | 05/04/2011 15:54 | 30.19 | 1 | 1100143 | 1105004-01 | 600 | 500 | | |
| L105061-MSD2 | QC | 05/04/2011 15:54 | 30.71 | 1 | 1100143 | 1105005-14 | 600 | 500 | | |

Extracts Relinquished By — Date: 5/5/11 14:50

Extracts Received By — Date: 5/5/11 1500

Lionville Laboratory Use Only: 1105004

# Custody Transfer Record/Lab Work Request

Page 1 of 1

Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: W.C. Hanford SAF# RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Alletta Johnson
QC: SW  Del: STD  TAT: 15 days
Date Rec'd: 5.3.11  Date Due: 5-6-11

| | | A | B |
|---|---|---|---|
| Refrigerator # | | 2 | 2 |
| #/Type Container | Liquid | | |
| | Solid | 1 gl | 1 pl/1 gl |
| Volume | Liquid | | |
| | Solid | 250 | 250 |
| Preservatives | | — | — |

ANALYSES REQUESTED →

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix * | Date Collected | Time Collected | ORGANIC VOA | BNA | Pest/PCB | Herb | PAHs 8270 | | INORG Metal | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 8270 PAH | | Met | |
| 01 | J1HJ08 | | | S | 4.26.11 | 0905 | | | | | X | | X | |
| 02 | J1HJ09 | | | | 4.27.11 | 0840 | | | | | X | | X | |
| 03 | J1HHW9 | | | | 4.26.11 | 0955 | | | | | | | X | |
| 04 | J1HHX0 | | | | 4.27.11 | 0835 | | | | | X | | X | |
| 05 | J1HHX1 | | | | | 12:30 | | | | | | | X | |
| 06 | J1HHX4 | | | | 4.25.11 | 1345 | | | | | | | X | |
| 07 | J1HHX5 | | | | 4.26.11 | 0930 | | | | | | | X | |
| 08 | J1HHX6 | | | | | 0935 | | | | | | | X | |
| 09 | J1HHX7 | | | | | 0920 | | | | | | | X | |
| 10 | J1HHX8 | | | | 4.25.11 | 1415 | | | | | X | | X | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

Special Instructions: Run matrix QC

Caution: Potential Beryllium Contamination

Special Instructions:
1. * Matrix (Soil) = Ash. = Other Solid
2.
3.
4.
5.
6. See BRC

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5.3.11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL | | | |
| REWRITTEN | | | |

9999999015

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-29 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | | SAF No.: RC-214 |
| Ice Chest No.: 6WS-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES/LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: 7970 5197 2441 |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 1mL | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J1HJ08 | OTHER | 4/26/11 | 0905 | X | X | X | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse | 4-26-11 1300 | Received By/Stored In: SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From: SSU #1 | 5/2/11 1100 | Received By/Stored In: L.D. Wall OHPRC | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall OHPRC | 5/2/11 1400 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: | 5-3-11 1050 | Received By/Stored In: | 5-3-11 1050 |
| 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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

9100000016

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-30 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | | SAF No.: RC-214 |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx 7970 5197 2441 |
| Shipped To: EBERLINE SERVICES/LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~See OSPC~~ DW 5/2/11 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 DE 4-28-11 | 1000mL | 10mL | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8220 | SPECIAL EXTRACTION - ASTM - D3987 | Total Uranium | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J1HJ09 | OTHER | 4-27-11 | 0840 | X | X | X | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: D Sparks | 4-28-11/0700 | SSU 2 | 4-28-11/0700 |
| Relinquished By/Removed From: SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC L.D. Wall | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall CHPRC L.D. Wall | 5/2/11 1400 | FEDEX | |
| Relinquished By/Removed From: FedEx | 5-3-11 1050 | [illegible] | 5-31-11/1050 |
| 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, Uranium, 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
Wl=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

3000000117

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-21 | Page 1 of 1 |
|---|---|---|---|
| Collector: KB Hulse D Sparling | Company Contact: JOAN KESSNER; Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C; Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658; COA: BESCAS | Method of Shipment: FedEx | |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: ~~See OSRC~~ 7970 5197 2441 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | ~~70mL~~ 125 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | J1HHW9 | OTHER | 4-26-11 | 0955 | X | | | | | | | | | |
| 17 | J1HHX0 | OTHER | 4-27-11 | 0835 | X | X | X | | | | | | | |
| 18 | J1HHX1 | OTHER | 4-27-11 | 1230 | X | | | | | | | | | |
| 19 | J1HHX2 | OTHER | | | | | | | | | | | | |
| 20 | J1HHX3 | OTHER | | | | | | | | | | | | |

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

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| ~~J Sparling~~ | ~~4-27-11 / 0700~~ | ~~SSU 1~~ | |
| SSU-1 | 4/27/11 / 0700 | L.D. Wall CHPRC | 4-27-11 / 0700 |
| L.D. Wall CHPRC | 4/28/11 / 0700 | SSU-1 | 4-28-11 / 0700 |
| SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | 5-3-11 / 1050 |

**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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

**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: FEDEX 5-3-11 1050 | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

81000000018

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-22 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | | SAF No.: RC-214 |
| Ice Chest No.: GW5826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~Sec OSPC~~ LW 5/2/11 7970 5197 2441 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potentiel Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 1 | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | 0mL | | | | | | | |
| SAMPLE ANALYSIS | Sec item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 (KB 4-27-11) | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium (KB 4-27-11) | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| 21 J1HHX4 | OTHER | 4/25/11 | 1345 | X | | | | | | | |
| 22 J1HHX5 | OTHER | 4/26/11 | 0930 | X | | | | | | | |
| 23 J1HHX6 | OTHER | 4/26/11 | 0935 | X | | | | | | | |
| 24 J1HHX7 | OTHER | 4/26/11 | 0920 | X | | | | | | | |
| 25 J1HHX8 | OTHER | 4/25/11 | 1415 | X | X | X | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: KB Hulse, Date/Time: 4-26-11 1300 | Received By/Stored In: SSU-1, Date/Time: 4-26-11 1300 (LW 5/2/11) | |
| Relinquished By/Removed From: SSU #1, Date/Time: 5/2/11 1100 | Received By/Stored In: L.D. Wall CHPRC, Date/Time: 5/2/11 1100 | |
| Relinquished By/Removed From: L.D. Wall CHPRC, Date/Time: 5/2/11 1400 | Received By/Stored In: FEDEX, Date/Time: | |
| Relinquished By/Removed From: FedEx, Date/Time: 5-3-11 1050 | Received By/Stored In: DSmith, Date/Time: 5-3-11 1050 | |
| 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, Uranium, Vanadium. Zinc); Mercury - 7471 - (CV) (Mercury)

**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

61000000

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hanford  Date: 5-3-11

Project/SAF/SOW/Release #: RC-214

LvL Batch #: 1105004  Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier [illegible] | | Airbill # 7970 5197 2441 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 3.4 | °C | Cooler # GWS-826 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☑ Yes 5/3/11 | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☐ Yes | ☐ No | ☑ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____  Date _____



00000828

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|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | **Reported:**<br>05/16/2011 06:53 |

## Analytical Report for Metals by SW846 6000/7000 series

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1HJ08 | 1105004-01 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09 | 1105004-02 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HHW9 | 1105004-03 | Other Solid | 04/26/2011 09:55 | 05/03/2011 10:50 |
| J1HHX0 | 1105004-04 | Other Solid | 04/27/2011 08:35 | 05/03/2011 10:50 |
| J1HHX1 | 1105004-05 | Other Solid | 04/27/2011 12:30 | 05/03/2011 10:50 |
| J1HHX4 | 1105004-06 | Other Solid | 04/25/2011 13:45 | 05/03/2011 10:50 |
| J1HHX5 | 1105004-07 | Other Solid | 04/26/2011 09:30 | 05/03/2011 10:50 |
| J1HHX6 | 1105004-08 | Other Solid | 04/26/2011 09:35 | 05/03/2011 10:50 |
| J1HHX7 | 1105004-09 | Other Solid | 04/26/2011 09:20 | 05/03/2011 10:50 |
| J1HHX8 | 1105004-10 | Other Solid | 04/25/2011 14:15 | 05/03/2011 10:50 |

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## Case Narrative

**Client:** WC-HANFORD RC-214
**LVL#:** 1105004
**SDG/SAF#:** K3346/RC-214

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 05-03-11

## 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 10 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.

   Samples J1HJ08, J1HHX1, J1HHX4, J1HHX6, J1HHX7, and J1HHX8 were analyzed and reported with 3-fold dilutions due to sample matrix.

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 (less than the LOQ).

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

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

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

10. The matrix spike (MS) recoveries for 2 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 26 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 |
|---|---|---|---|
| J1HJ08 | Antimony | 100 | 101.0 |
| | Barium | 1,100 | 97.6 |

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

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

5/9/17
Date

alm/05-004

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| B | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag) |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HJ08

### 1105004-01 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.956** | B | 1.61 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **8.09** | | 2.68 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **1130** | | 1.34 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.14** | | 0.536 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **35.6** | | 5.36 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.202** | B | 0.536 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **10.6** | | 0.536 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **5.12** | B | 5.36 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **26.2** | | 2.68 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **4.91** | | 1.34 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **187** | | 13.4 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.59** | B | 5.36 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **11.2** | | 10.7 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Selenium | 0.804 | U | 0.804 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.536 | U | 0.536 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.34 | U | 1.34 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **8.68** | B | 53.6 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **33.5** | | 6.70 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **23.8** | B | 26.8 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0255** | B | 0.0273 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HJ09

### 1105004-02 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.469 | U | 0.469 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **2.50** | | 0.781 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **681** | | 0.391 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.68** | | 0.156 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **262** | | 1.56 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.135** | B | 0.156 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **13.3** | | 0.156 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **2.64** | | 1.56 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **19.6** | | 0.781 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **4.33** | | 0.391 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **38.5** | | 3.91 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.31** | B | 1.56 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **7.67** | | 3.12 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **0.367** | | 0.234 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.156 | U | 0.156 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 0.391 | U | 0.391 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **8.07** | B | 15.6 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **29.2** | | 1.95 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **15.1** | | 7.81 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0797** | | 0.0265 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHW9
### 1105004-03 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.376** | B | 0.455 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **4.07** | | 0.758 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **1360** | | 0.379 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.50** | | 0.152 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **129** | | 1.52 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.182** | | 0.152 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **6.74** | | 0.152 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **3.55** | | 1.52 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **19.1** | | 0.758 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **3.18** | | 0.379 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **283** | | 3.79 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.33** | B | 1.52 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **7.12** | | 3.03 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **0.361** | | 0.227 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.152 | U | 0.152 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 0.379 | U | 0.379 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **7.37** | B | 15.2 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **24.6** | | 1.89 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **24.6** | | 7.58 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0221** | B | 0.0273 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX0

### 1105004-04 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.484 | U | 0.484 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **2.50** | | 0.806 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **556** | | 0.403 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.31** | | 0.161 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **269** | | 1.61 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.221** | | 0.161 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **10.6** | | 0.161 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **2.51** | | 1.61 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **21.9** | | 0.806 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **6.28** | | 0.403 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **57.5** | | 4.03 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.17** | B | 1.61 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **7.02** | | 3.23 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **0.331** | | 0.242 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.161 | U | 0.161 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 0.403 | U | 0.403 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **6.40** | B | 16.1 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **27.3** | | 2.02 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **32.4** | | 8.06 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0525** | | 0.0281 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX1
### 1105004-05 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.818** | B | 1.58 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **5.69** | | 2.63 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **599** | | 1.32 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.36** | | 0.526 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **156** | | 5.26 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.337** | B | 0.526 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **10.5** | | 0.526 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **3.97** | B | 5.26 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **25.6** | | 2.63 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **6.58** | | 1.32 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **145** | | 13.2 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.47** | B | 5.26 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **9.39** | B | 10.5 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Selenium | 0.789 | U | 0.789 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.526 | U | 0.526 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.32 | U | 1.32 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **7.28** | B | 52.6 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **31.4** | | 6.58 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **37.3** | | 26.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0366** | | 0.0257 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX4
### 1105004-06 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.918** | B | 1.55 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **4.76** | | 2.59 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **406** | | 1.29 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.12** | | 0.517 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **145** | | 5.17 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.914** | | 0.517 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **14.4** | | 0.517 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **3.06** | B | 5.17 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **25.0** | | 2.59 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **18.4** | | 1.29 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **116** | | 12.9 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **0.752** | B | 5.17 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **9.09** | B | 10.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **2.00** | | 0.776 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.517 | U | 0.517 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.29 | U | 1.29 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **9.08** | B | 51.7 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **29.3** | | 6.47 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **104** | | 25.9 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.338** | | 0.0273 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX5

### 1105004-07 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.416** | B | 0.566 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **1.33** | | 0.943 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **.184** | | 0.472 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **0.632** | | 0.189 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **66.3** | | 1.89 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.0961** | B | 0.189 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **4.76** | | 0.189 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **1.00** | B | 1.89 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **8.60** | | 0.943 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **6.50** | | 0.472 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **13.1** | | 4.72 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **0.314** | B | 1.89 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **3.02** | B | 3.77 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **0.664** | | 0.283 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.189 | U | 0.189 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 0.472 | U | 0.472 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **2.00** | B | 18.9 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **9.73** | | 2.36 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **9.43** | B | 9.43 | mg/kg wet | 1 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0429** | | 0.0257 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/05/2011 | 7471A |

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| | | |
|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX6

### 1105004-08 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **1.91** | | 1.70 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **9.59** | | 2.83 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **2250** | | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **3.22** | | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **327** | | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.899** | | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **25.5** | | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **15.1** | | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **94.3** | | 2.83 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **19.0** | | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **344** | | 14.2 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **3.85** | B | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **31.5** | | 11.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **1.36** | | 0.849 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.566 | U | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.42 | U | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **18.4** | B | 56.6 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **113** | | 7.08 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **94.8** | | 28.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.146** | | 0.0265 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/06/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX7
### 1105004-09 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **1.00** | B | 1.76 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **5.42** | | 2.94 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **1310** | | 1.47 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.60** | | 0.588 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **192** | | 5.88 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.219** | B | 0.588 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **13.3** | | 0.588 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **5.84** | B | 5.88 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **36.7** | | 2.94 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **10.6** | | 1.47 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **159** | | 14.7 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.67** | B | 5.88 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **13.8** | | 11.8 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Selenium | 0.882 | U | 0.882 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.588 | U | 0.588 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.47 | U | 1.47 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **9.93** | B | 58.8 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **46.3** | | 7.35 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **28.0** | B | 29.4 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.0873** | | 0.0281 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/06/2011 | 7471A |

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| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## J1HHX8

### 1105004-10 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **1.69** | B | 1.70 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Arsenic** | **10.3** | | 2.83 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Barium** | **1420** | | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Beryllium** | **1.65** | | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Boron** | **107** | | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cadmium** | **0.385** | B | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Chromium** | **11.2** | | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Cobalt** | **4.66** | B | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Copper** | **28.4** | | 2.83 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Lead** | **13.4** | | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Manganese** | **391** | | 14.2 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Molybdenum** | **1.14** | B | 5.66 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Nickel** | **10.5** | B | 11.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Selenium** | **1.58** | | 0.849 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Silver | 0.566 | U | 0.566 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| Thallium | 1.42 | U | 1.42 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Uranium** | **12.6** | B | 56.6 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Vanadium** | **36.2** | | 7.08 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Zinc** | **38.0** | | 28.3 | mg/kg wet | 3 | L105068 | 05/05/2011 | 05/08/2011 | 6010B |
| **Mercury** | **0.115** | | 0.0265 | mg/kg wet | 1 | L105063 | 05/04/2011 | 05/06/2011 | 7471A |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## 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 L105063 - SW 7471A Prep** | | | | | | | | | | |
| **Blank (L105063-BLK1)** | | | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Mercury | 0.0281 | U | 0.0281 | mg/kg wet | | | | | | |
| **Duplicate (L105063-DUP3)** | | Source: 1105004-01 | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Mercury | 0.0295 | | 0.0273 | mg/kg wet | | 0.0255 | | | 14.9 | 20 |
| **Matrix Spike (L105063-MS3)** | | Source: 1105004-01 | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Mercury | 0.175 | | 0.0265 | mg/kg wet | 0.14706 | 0.0255 | 102 | 75-125 | | |
| **Reference (L105063-SRM1)** | | | | Prepared: 05/04/2011 Analyzed: 05/05/2011 | | | | | | |
| Mercury | 1.17 | | 0.0290 | mg/kg wet | 1.2900 | | 90.8 | 62.6-138 | | |
| **Batch L105068 - SW 3050B** | | | | | | | | | | |
| **Blank (L105068-BLK1)** | | | | Prepared: 05/05/2011 Analyzed: 05/08/2011 | | | | | | |
| Antimony | 0.276 | B | 0.380 | mg/kg wet | | | | | | |
| Arsenic | 0.633 | U | 0.633 | mg/kg wet | | | | | | |
| Barium | 0.145 | B | 0.316 | mg/kg wet | | | | | | |
| Beryllium | 0.127 | U | 0.127 | mg/kg wet | | | | | | |
| Boron | 1.27 | U | 1.27 | mg/kg wet | | | | | | |
| Cadmium | 0.127 | U | 0.127 | mg/kg wet | | | | | | |
| Chromium | 0.127 | U | 0.127 | mg/kg wet | | | | | | |
| Cobalt | 1.27 | U | 1.27 | mg/kg wet | | | | | | |
| Copper | 0.633 | U | 0.633 | mg/kg wet | | | | | | |
| Lead | 0.316 | U | 0.316 | mg/kg wet | | | | | | |
| Manganese | 3.16 | U | 3.16 | mg/kg wet | | | | | | |
| Molybdenum | 1.27 | U | 1.27 | mg/kg wet | | | | | | |
| Nickel | 2.53 | U | 2.53 | mg/kg wet | | | | | | |
| Selenium | 0.190 | U | 0.190 | mg/kg wet | | | | | | |
| Silver | 0.127 | U | 0.127 | mg/kg wet | | | | | | |
| Thallium | 0.316 | U | 0.316 | mg/kg wet | | | | | | |
| Uranium | 12.7 | U | 12.7 | mg/kg wet | | | | | | |
| Vanadium | 1.58 | U | 1.58 | mg/kg wet | | | | | | |
| Zinc | 6.33 | U | 6.33 | mg/kg wet | | | | | | |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## 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 L105068 - SW 3050B** | | | | | | | | | | |
| **Duplicate (L105068-DUP1)** | | **Source: 1105004-01** | | Prepared: 05/05/2011 Analyzed: 05/08/2011 | | | | | | |
| Antimony | 0.871 | B | 1.30 | mg/kg wet | | 0.956 | | | 9 | 20 |
| Arsenic | 6.79 | | 2.17 | mg/kg wet | | 8.09 | | | 17 | 20 |
| Barium | 1130 | | 1.09 | mg/kg wet | | 1130 | | | 0.08 | 20 |
| Beryllium | 1.07 | | 0.435 | mg/kg wet | | 1.14 | | | 7 | 20 |
| Boron | 42.3 | | 4.35 | mg/kg wet | | 35.6 | | | 17 | 20 |
| Cadmium | 0.165 | B | 0.435 | mg/kg wet | | 0.202 | | | 20 | 20 |
| Chromium | 9.78 | | 0.435 | mg/kg wet | | 10.6 | | | 8 | 20 |
| Cobalt | 4.77 | | 4.35 | mg/kg wet | | 5.12 | | | 7 | 20 |
| Copper | 22.5 | | 2.17 | mg/kg wet | | 26.2 | | | 15 | 20 |
| Lead | 4.47 | | 1.09 | mg/kg wet | | 4.91 | | | 9 | 20 |
| Manganese | 161 | | 10.9 | mg/kg wet | | 187 | | | 15 | 20 |
| Molybdenum | 1.60 | B | 4.35 | mg/kg wet | | 1.59 | | | 0.02 | 20 |
| Nickel | 11.0 | | 8.70 | mg/kg wet | | 11.2 | | | 2 | 20 |
| Selenium | 1.11 | | 0.652 | mg/kg wet | | 0.804 U | | | | 20 |
| Silver | 0.435 | U | 0.435 | mg/kg wet | | 0.536 U | | | | 20 |
| Thallium | 1.09 | U | 1.09 | mg/kg wet | | 1.34 U | | | | 20 |
| Uranium | 9.24 | B | 43.5 | mg/kg wet | | 8.68 | | | 6 | 20 |
| Vanadium | 34.0 | | 5.43 | mg/kg wet | | 33.5 | | | 2 | 20 |
| Zinc | 23.5 | | 21.7 | mg/kg wet | | 23.8 | | | 1 | 20 |
| **Matrix Spike (L105068-MS1)** | | **Source: 1105004-01** | | Prepared: 05/05/2011 Analyzed: 05/08/2011 | | | | | | |
| Antimony | 12.2 | | 1.30 | mg/kg wet | 36.232 | 0.956 | 31* | 75-125 | | 20 |
| Arsenic | 136 | | 2.17 | mg/kg wet | 144.93 | 8.09 | 88 | 75-125 | | 20 |
| Barium | 1310 | | 1.09 | mg/kg wet | 144.93 | 1130 | 128* | 75-125 | | 20 |
| Beryllium | 4.49 | | 0.435 | mg/kg wet | 3.6232 | 1.14 | 92 | 75-125 | | 20 |
| Boron | 103 | | 4.35 | mg/kg wet | 72.464 | 35.6 | 94 | 75-125 | | 20 |
| Cadmium | 3.20 | | 0.435 | mg/kg wet | 3.6232 | 0.202 | 83 | 75-125 | | 20 |
| Chromium | 23.6 | | 0.435 | mg/kg wet | 14.493 | 10.6 | 90 | 75-125 | | 20 |
| Cobalt | 37.6 | | 4.35 | mg/kg wet | 36.232 | 5.12 | 90 | 75-125 | | 20 |
| Copper | 43.2 | | 2.17 | mg/kg wet | 18.116 | 26.2 | 94 | 75-125 | | 20 |
| Lead | 35.6 | | 1.09 | mg/kg wet | 36.232 | 4.91 | 85 | 75-125 | | 20 |
| Manganese | 231 | | 10.9 | mg/kg wet | 36.232 | 187 | 121 | 75-125 | | 20 |
| Molybdenum | 64.8 | | 4.35 | mg/kg wet | 72.464 | 1.59 | 87 | 75-125 | | 20 |
| Nickel | 43.3 | | 8.70 | mg/kg wet | 36.232 | 11.2 | 89 | 75-125 | | 20 |
| Selenium | 125 | | 0.652 | mg/kg wet | 144.93 | 0.804 U | 87 | 75-125 | | 20 |
| Silver | 3.38 | | 0.435 | mg/kg wet | 3.6232 | 0.536 U | 93 | 75-125 | | 20 |
| Thallium | 119 | | 1.09 | mg/kg wet | 144.93 | 1.34 U | 82 | 75-125 | | 20 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 05/16/2011 06:53 |

## 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 L105068 - SW 3050B** | | | | | | | | | |
| **Matrix Spike (L105068-MS1)** | | **Source: 1105004-01** | Prepared: 05/05/2011 Analyzed: 05/08/2011 | | | | | | |
| Uranium | 327 | 43.5 | mg/kg wet | 362.32 | 8.68 | 88 | 75-125 | | 20 |
| Vanadium | 73.4 | 5.43 | mg/kg wet | 36.232 | 33.5 | 110 | 75-125 | | 20 |
| Zinc | 58.9 | 21.7 | mg/kg wet | 36.232 | 23.8 | 97 | 75-125 | | 20 |
| **Reference (L105068-SRM1)** | | | Prepared: 05/05/2011 Analyzed: 05/08/2011 | | | | | | |
| Antimony | 45.1 | 1.61 | mg/kg wet | 53.000 | | 85 | 0-235.8 | | |
| Arsenic | 116 | 2.68 | mg/kg wet | 114.00 | | 102 | 82.8-117.54 | | |
| Barium | 293 | 1.34 | mg/kg wet | 307.00 | | 95 | 79.8-120.2 | | |
| Beryllium | 110 | 0.536 | mg/kg wet | 108.00 | | 101 | 82.8-117.6 | | |
| Boron | 77.8 | 5.36 | mg/kg wet | 85.100 | | 91 | 67.5-132.8 | | |
| Cadmium | 230 | 0.536 | mg/kg wet | 225.00 | | 102 | 83.6-116.4 | | |
| Chromium | 82.6 | 0.536 | mg/kg wet | 77.200 | | 107 | 73.3-126.4 | | |
| Cobalt | 166 | 5.36 | mg/kg wet | 166.00 | | 100 | 80.7-118.7 | | |
| Copper | 266 | 2.68 | mg/kg wet | 271.00 | | 98 | 80.8-119.2 | | |
| Lead | 182 | 1.34 | mg/kg wet | 190.00 | | 96 | 81.6-118.4 | | |
| Manganese | 1060 | 13.4 | mg/kg wet | 965.00 | | 110 | 69.3-130.5 | | |
| Molybdenum | 244 | 5.36 | mg/kg wet | 235.00 | | 104 | 76.2-123.8 | | |
| Nickel | 225 | 10.7 | mg/kg wet | 221.00 | | 102 | 79.6-120.8 | | |
| Selenium | 186 | 0.804 | mg/kg wet | 187.00 | | 100 | 75.9-124.6 | | |
| Silver | 83.9 | 0.536 | mg/kg wet | 83.500 | | 101 | 82.7-117.1 | | |
| Thallium | 84.9 | 1.34 | mg/kg wet | 86.800 | | 98 | 77.3-122.1 | | |
| Vanadium | 104 | 6.70 | mg/kg wet | 98.700 | | 105 | 75.9-123.6 | | |
| Zinc | 196 | 26.8 | mg/kg wet | 199.00 | | 99 | 78.4-121.6 | | |

**Lionville Laboratory** **Logbook #:** 963

## SAMPLE DIGESTION RECORD

Digestion Batch #: L105068
Date/Time Initiated: 5/5/11 1070
Date/Time Completed: 5/5/11 1605
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)

Digested / Undigested (circle one)
Balance #: B19
Balance Cal Verification: Y NA
Temp: 95
BLOCK 1 2 (circle one)

**NOTE**: All temperatures are recorded as corrected temperatures

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1105004-01 | | 0.56 | 50 | | TO | Fine | Black | | N/A |
| L105068-Dup | | 0.69 | 50 | | | | | | |
| * -MS1 | 0.5 | 0.69 | 50 | | | | | | |
| 1105004-02 | | 0.64 | 50 | | | Fine | Black | | |
| -03 | | 0.66 | 50 | | | Fine | Black | | |
| -04 | | 0.62 | 50 | | | Fine | Black | | |
| -05 | | 0.57 | 50 | | | Fine | Black | | |
| -06 | | 0.58 | 50 | | | Fine | Black | | |
| 07 | | 0.53 | 50 | | | Fine | Black | | |
| 08 | | 0.53 | 50 | | | Fine | Black | | |
| 09 | | 0.51 | 50 | | | Fine | Black | Rocks | |
| 10 | | 0.53 | 50 | | | Fine | Black | Rocks | |
| L105068-BLK1 | | 0.79 | 50 | | | Coarse | Boiling | | |
| -SPM1 | 2 | 0.56 | 50 | | | Fine | Chips | | |

JJS
5/5/11

Spiking IDs / Expiration Date:
MS#: 1001943
LCS#: B1100103

Reagent IDs:
$HNO_3$ K09041
HCl K12046
$H_2O_2$ K03A11
1:1 $HNO_3$ 637-041-05
1:1 HCl

File ID#:

Data Review By / Date: aem 5/9/11

R:\group\QA\SOP\
Signed\SPI\Metals Digestion log.doc

* 6072-091-16 2 Sone

Page #:



000000018

Lionville Laboratory

# MERCURY PREPARATION

Analyst: [illegible]
Date 5/4/11
Start Time/Temp 2205 / 96°
End Time/Temp: 2235 / 98°

Instrument ID: HG3.1/HG3.2/HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) ✓

Logbook # 924
Prep Batch: L105063
Worksheet: HG050501/HG050502/HG050601
SOP No. ME-HgCVAA
BLOCK 1 (2) (circle one)

**NOTE: All temperatures are recorded as corrected temperatures.**

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| blank | | | | 10ml | 50 | Curve depicted with |
| 0.2 µg/L | | 0.100 | | 10ml | 50 | L105043 and L105044 |
| 1.0 µg/L | | 0.500 | | 10ml | 50 | |
| 2.0 µg/L | | 1.000 | | 10ml | 50 | |
| 5.0 µg/L | | 2.500 | | 10ml | 50 | |
| 10.0 µg/L | | 5.000 | | 10ml | 50 | |
| ICV | | 0.125 | 2.5 | 10ml | 50 | |
| CCV | | 0.250 | 5.0 | 10ml | 50 | |
| ICB/CCB | | | | 10ml | 50 | |
| L105063-BLK1 | | | | 0.32 | 50 | |
| SRM1 | | | | 0.31 | 50 | |
| 1104098-01 | | | | 0.34 | 50 | |
| L105063-DUP1 | | | | 0.34 | 50 | |
| MS1 | | 0.500 | 1.0 | 0.36 | 50 | |
| 1104098-02 | | | | 0.35 | 50 | |
| 03 | | | | 0.35 | 50 | |
| 04 | | | | 0.38 | 50 | |
| 05 | | | | 0.38 | 50 | |
| 06 | | | | 0.32 | 50 | |
| 07 | | | | 0.36 | 50 | |
| 1104100-01 | | | | 0.36 | 50 | |
| L105063-DUP2 | | | | 0.34 | 50 | |
| MS2 | | 0.500 | 1.0 | 0.39 | 50 | |
| 1105004-01 | | | | ~~0.31~~ 0.33 | 50 | balance B-14 |
| L105063-DUP3 | | | | ~~0.36~~ 0.33 | 50 | |
| MS3 | | 0.500 | 1.0 | ~~0.35~~ 0.34 | 50 | |
| 1105004-02 | | | | ~~0.31~~ * 0.34 | 50 | |

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | RF 1001785B | 5/4/11 1135 |
| ICV/CCV/LCS | I.V. 1001781A | ↓ |

Reviewed By/Date: [illegible] 5/6/11

*weighed out 1105005 instead of 1105004 MW 5/4/11

se book # 9368 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1100103

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 924

Analyst: [illegible]
Date 5/4/11
Start Time/Temp: 094
End Time/Temp: See pg

Instrument ID: HG3.1/HG3.2/HG3.1
Balance # B29/B14 /NA
Pipette Calibration (Daily) (Y) ____

Prep Batch: L105063
Worksheet: HG050501/HG050502/HG050601
SOP No. ME-HgCVAA
BLOCK 1 (2) (circle one)

**NOTE: All temperatures are recorded as corrected temperatures.**

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| 1105004-03 | | | | (*) 0.34 0.33 | 50 | balance B14 |
| 04 | | | | 0.36 0.32 | 50 | |
| 05 | | | | 0.35 0.35 | 50 | |
| 06 | | | | 0.36 0.33 | 50 | |
| 07 | | | | 0.38 0.35 | 50 | |
| 08 | | | | 0.34 | 50 | |
| 09 | | | | 0.32 | 50 | |
| 10 | | | | 0.34 | 50 | |

(*) Initial recorded weight was 1105005, NOT 1105004 MW 5/4/11

MW 5/4/11

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | | |
| ICV/CCV/LCS | see page 094 | |

Reviewed By/Date: [illegible] 5/6/11

W.E. MW 5/4/11

se book # 919365 for std traceability information

Soil LCS True Value = see page 094 mg/Kg
Standard # ____

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory Use Only

1105004

# Custody Transfer Record/Lab Work Request

Page 1 of 1

Lionville Laboratory
A Division of Eberline Analytical Corporation

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client WC-Hanford SAF# RC-214

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Alotta Johnson

QC SW Del STD TAT 15 days

3 OSJ 5/3/11

Date Rec'd 5-3-11 Date Due 5-6-11

| | | A | B |
|---|---|---|---|
| Refrigerator # | | 2 | 2 |
| #/Type Container | Liquid | | |
| | Solid | 1qt | 1pt/qt |
| Volume | Liquid | | |
| | Solid | 250 | 250 |
| Preservatives | | — | — |

ANALYSES REQUESTED →

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix * | Date Collected | Time Collected | ORGANIC VOA | BNA | Pest/PCB | Herb | PAHS 8270 | | INORG Metal + Hg | CN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Lionville Laboratory Use Only | | | | 8270 PAH | | Met | |
| | 01 | J1HJ08 | | | S | 4.26.11 | 0905 | | | | | X | | X | |
| | 02 | J1HJ09 | | | | 4.27.11 | 0840 | | | | | X | | X | |
| | 03 | J1HHW9 | | | | 4.26.11 | 0955 | | | | | | | X | |
| | 04 | J1HHX0 | | | | 4.27.11 | 0835 | | | | | X | | X | |
| | 05 | J1HHX1 | | | | | 12.30 | | | | | | | X | |
| | 06 | J1HHX4 | | | | 4.25.11 | 1345 | | | | | | | X | |
| | 07 | J1HHX5 | | | | 4.26.11 | 0930 | | | | | | | X | |
| | 08 | J1HHX6 | | | | | 0935 | | | | | | | X | |
| | 09 | J1HHX7 | | | | | 0920 | | | | | | | X | |
| | 10 | J1HHX8 | | | | 4.25.11 | 1415 | | | | | X | | X | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

Special Instructions: Run Matrix QC

Caution:
Potential Beryllium Contamination

Special Instructions:
1. * Matrix (Soil) = Ash. = Other Solid
2.
3.
4.
5.
6.

See SRC

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL | | | |
| REWRITTEN | | | |

00000021

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-29 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | SAF No.: RC-214 | |
| Ice Chest No.: 6WS-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES LIONVILLE | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: 7970 5197 2441 See ~~OSPC~~ LW. 5/2/11 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 1mL | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | | |
| J1HJ08 / OTHER / 4/26/11 / 0905 | X | X | X | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|---|
| Relinquished By/Removed From | KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From | SSU#1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| Relinquished By/Removed From | L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | |
| Relinquished By/Removed From | | 5-3-11 1050 | | 5-3-11 1050 |
| 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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

22000000

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-30 | Page 1 of 1 |
|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER; Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C; Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658; COA: BESCAS | Method of Shipment: FedEx 7970 5197 2441 | |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: ~~See OSPC~~ DW 5/2/11 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 DE 4-28-11 | 1000mL | 10mL | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8220 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J1HJ09 | OTHER | 4-27-11 | 0840 | X | X | X | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: D Sparks | 4-28-11 | SSU 2 | 4-28-11/0700 |
| Relinquished By/Removed From: SSU#1 | 5/2/11 1100 | Received By/Stored In: L.D. Wall CHPRC L.D. Wall | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall CHPRC L.D. Wall | 5/2/11 1400 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: Fed Ex | 5-3-11 1050 | Received By/Stored In: [illegible] | 5-31-11/1050 |
| 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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

0000023

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-21 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: RB Hulse D Spurlock | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | | SAF No.: RC-214 |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~See OSRC~~ 7970 5197 2441 |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | ~~70mL~~ 125 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | J1HHW9 | OTHER | 4-26-11 | 0955 | X | | | | | | | | | |
| 17 | J1HHX0 | OTHER | 4-27-11 | 0835 | X | X | X | | | | | | | |
| 18 | J1HHX1 | OTHER | 4-27-11 | 1230 | X | | | | | | | | | |
| 19 | J1HHX2 | OTHER | | | | | | | | | | | | |
| 20 | J1HHX3 | OTHER | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| RB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| ~~J Scales~~ | ~~4-27-11 / 0700~~ | ~~SSU 1~~ | |
| SSU-1 | 4/27/11 / 0700 | L.D. Wall CHPRC | 4-27-11/0700 |
| L.D. Wall CHPRC | 4/28/11/0700 | SSU-1 | 4-28-11/0700 |
| SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | 5-3-11/1050 |

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, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

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: FEDEX 5-3-11/1050 | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

12099996

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-22 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | | SAF No.: RC-214 |
| Ice Chest No.: GW5826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~Sec OSPC~~ 7970 5197 2441 |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 1 | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | 0mL | | | | | | | |
| SAMPLE ANALYSIS | Sec item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | J1HHX4 | OTHER | 4/25/11 | 1345 | X | | | | | | | | | |
| 22 | J1HHX5 | OTHER | 4/26/11 | 0930 | X | | | | | | | | | |
| 23 | J1HHX6 | OTHER | 4/26/11 | 0935 | X | | | | | | | | | |
| 24 | J1HHX7 | OTHER | 4/26/11 | 0920 | X | | | | | | | | | |
| 25 | J1HHX8 | OTHER | 4/25/11 | 1415 | X | X | X | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: KB Hulse, 4-26-11 1300 | Received By/Stored In: SSU-1 | Date/Time: 4-26-11 1300 |
| Relinquished By/Removed From: SSU #1, 5/2/11 1100 | Received By/Stored In: L.D. Wall CHPRC, 5/2/11 1100 | Date/Time: 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall CHPRC, 5/2/11 1400 | Received By/Stored In: FEDEX | Date/Time: |
| Relinquished By/Removed From: FedEx 5-3-11 1050 | Received By/Stored In: DSmith 5-3-11 1050 | Date/Time: |
| Relinquished By/Removed From: | Received By/Stored In: | Date/Time: |
| Relinquished By/Removed From: | 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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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

5290000025

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hanford  Date: 5-3-11

Project/SAF/SOW/Release #: RC-214

LvL Batch #: 1105004  Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier Fed Ex | | Airbill # 7970 5197 2441 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 3.4 | °C | Cooler # GWS-826 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact. signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ~~☐ Yes~~ 5/3/11 | ☐ No | ~~☐ N/A~~ |
| 13. VOA. TOC. TOX free of headspace? | ☐ Yes | ☐ No | ☑ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy. which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ~~☐ N/A~~ |
| Person Contacted _____ | | Date _____ | |

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A division of Eberline Analytical Corporation

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

20 June 2011

RECEIVED
JUN 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1105007 |
| SDG # | K3346 SPEC EXT |
| SAF # | RC-214 |
| Date Received | 05/03/11 |
| # Samples | 2 |
| Matrix | OTHER SOLID |
| Volatiles | |
| Semivolatiles | |
| Pest/PCB | |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | |
| Metals | X |
| Inorganics | |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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RECEIVED
JUN 2011

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | **Reported:**<br>06/20/2011 15:29 |

## Analytical Report for Metals by SW846 6000/7000 series

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1HJ08-1 | 1105007-01 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-2 | 1105007-02 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-3 | 1105007-03 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-4 | 1105007-04 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09-1 | 1105007-05 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-2 | 1105007-06 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-3 | 1105007-07 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-4 | 1105007-08 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ08-A1 | 1105007-17 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-B1 | 1105007-18 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-B2 | 1105007-19 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-C1 | 1105007-20 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09-A1 | 1105007-21 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-B1 | 1105007-22 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-C1 | 1105007-23 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-C2 | 1105007-24 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |

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**Case Narrative**

**Client:** WC-HANFORD RC-214
**LVL#:** 1105007
**SDG/SAF#:** K3346/RC-214

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 05-03-11

**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 2 soil samples analyzed in quadruplicate and 8 TCLP leachate samples.

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

   TCLP leachate samples J1HJ08-A1 was prepared with 5-fold dilutions for ICP metals due to insufficient sample volume.

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

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

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

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

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

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


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 39 pages.

9. All laboratory control samples (LCS) were within the 80-120% control limits. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer. Uranium is not an SRM analyte.

10. The soil matrix spike (MS) recoveries were within the 75-125% control limits.

11. The TCLP extract from sample J1HJ08-B1 was selected for the matrix spikes (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

    The TCLP matrix spike was analyzed and reported with a 5-fold dilution for all TCLP leachate analytes due to the high concentration of Barium in the sample.

12. 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.

13. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

6/20/11
Date

alm/05-007U/TC

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| B | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag) |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |

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| | | |
|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-1
### 1105007-01 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **10.8** | | 0.855 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **1490** | | 0.428 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.262** | | 0.214 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **12.3** | | 0.855 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **5.52** | | 0.855 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **0.951** | | 0.855 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 0.855 | U | 0.855 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **8.60** | | 8.55 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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| | | |
|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-2
## 1105007-02 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **9.44** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **1390** | | 0.529 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.248** | B | 0.265 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **12.8** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **5.56** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **1.35** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 1.06 | U | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **7.74** | B | 10.6 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-3

### 1105007-03 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **8.75** | | 1.01 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **1650** | | 0.503 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.242** | B | 0.252 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **13.5** | | 1.01 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **5.91** | | 1.01 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **1.31** | | 1.01 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 1.01 | U | 1.01 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **8.13** | B | 10.1 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
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## J1HJ08-4
## 1105007-04 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **10.5** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **1620** | | 0.529 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.282** | | 0.265 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **13.3** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **6.56** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **1.35** | | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 1.06 | U | 1.06 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **8.04** | B | 10.6 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-1
## 1105007-05 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **2.81** | | 1.04 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **1250** | | 0.521 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.216** | B | 0.260 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **15.5** | | 1.04 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **5.89** | | 1.04 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Selenium | 1.04 | U | 1.04 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 1.04 | U | 1.04 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **10.7** | | 10.4 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-2
## 1105007-06 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **2.88** | | 0.913 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **818** | | 0.457 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.184** | B | 0.228 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **16.0** | | 0.913 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **5.01** | | 0.913 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Selenium | 0.913 | U | 0.913 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 0.913 | U | 0.913 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **11.9** | | 9.13 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-3
### 1105007-07 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **2.33** | | 0.802 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **870** | | 0.401 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.190** | B | 0.201 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **14.4** | | 0.802 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **4.45** | | 0.802 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **0.271** | B | 0.802 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 0.802 | U | 0.802 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **10.2** | | 8.02 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-4
## 1105007-08 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **2.64** | | 0.848 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Barium** | **828** | | 0.424 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Cadmium** | **0.231** | | 0.212 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Chromium** | **15.0** | | 0.848 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Lead** | **6.59** | | 0.848 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Selenium** | **0.255** | B | 0.848 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| Silver | 0.848 | U | 0.848 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |
| **Uranium** | **10.1** | | 8.48 | mg/kg dry | 1 | L105215 | 05/17/2011 | 06/03/2011 | 6010B |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-A1
## 1105007-17 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.150 | U | 0.150 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0385** | | 0.0250 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.0150 | U | 0.0150 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Chromium | 0.0150 | U | 0.0150 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.150 | U | 0.150 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.250 | U | 0.250 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.0250 | U | 0.0250 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 1.50 | U | 1.50 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-B1
## 1105007-18 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0464** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Chromium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-B2

## 1105007-19 (Leachate)

### Lionville Laboratory

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0448** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Chromium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ08-C1

### 1105007-20 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0465** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Chromium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-A1
### 1105007-21 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0478** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Chromium** | **0.00635** | | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-B1
## 1105007-22 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0373** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Chromium** | **0.00281** | B | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-C1
## 1105007-23 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0295** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Chromium** | **0.00195** | B | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## J1HJ09-C2
## 1105007-24 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Barium** | **0.0272** | | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| **Chromium** | **0.00184** | B | 0.00300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Lead | 0.0300 | U | 0.0300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Selenium | 0.0500 | U | 0.0500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Silver | 0.00500 | U | 0.00500 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |
| Uranium | 0.300 | U | 0.300 | mg/L | 1 | L106016 | 06/02/2011 | 06/04/2011 | 6010 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## 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 L105215 - SW 3050B** | | | | | | | | | | |
| **Blank (L105215-BLK1)** | | | | Prepared: 05/17/2011 Analyzed: 06/03/2011 | | | | | | |
| Arsenic | 0.714 | U | 0.714 | mg/kg wet | | | | | | |
| Barium | 0.357 | U | 0.357 | mg/kg wet | | | | | | |
| Cadmium | 0.179 | U | 0.179 | mg/kg wet | | | | | | |
| Chromium | 0.714 | U | 0.714 | mg/kg wet | | | | | | |
| Lead | 0.714 | U | 0.714 | mg/kg wet | | | | | | |
| Selenium | 0.714 | U | 0.714 | mg/kg wet | | | | | | |
| Silver | 0.714 | U | 0.714 | mg/kg wet | | | | | | |
| Uranium | 7.14 | U | 7.14 | mg/kg wet | | | | | | |
| **Matrix Spike (L105215-MS1)** | | **Source: 1105007-01** | | Prepared: 05/17/2011 Analyzed: 06/03/2011 | | | | | | |
| Arsenic | 214 | | 1.18 | mg/kg dry | 235.58 | 10.8 | 86 | 75-125 | | 20 |
| Barium | 1700 | | 0.589 | mg/kg dry | 235.58 | 1490 | 88 | 75-125 | | 20 |
| Cadmium | 4.98 | | 0.294 | mg/kg dry | 5.8895 | 0.262 | 80 | 75-125 | | 20 |
| Chromium | 33.5 | | 1.18 | mg/kg dry | 23.558 | 12.3 | 90 | 75-125 | | 20 |
| Lead | 50.8 | | 1.18 | mg/kg dry | 58.895 | 5.52 | 77 | 75-125 | | 20 |
| Selenium | 200 | | 1.18 | mg/kg dry | 235.58 | 0.951 | 85 | 75-125 | | 20 |
| Silver | 4.84 | | 1.18 | mg/kg dry | 5.8895 | 0.855 U | 82 | 75-125 | | 20 |
| Uranium | 493 | | 11.8 | mg/kg dry | 588.95 | 8.60 | 82 | 75-125 | | 20 |
| **Reference (L105215-SRM1)** | | | | Prepared: 05/17/2011 Analyzed: 06/03/2011 | | | | | | |
| Arsenic | 120 | | 2.11 | mg/kg wet | 114.00 | | 105 | 82.8-117.54 | | |
| Barium | 329 | | 1.06 | mg/kg wet | 307.00 | | 107 | 79.8-120.2 | | |
| Cadmium | 237 | | 0.528 | mg/kg wet | 225.00 | | 105 | 83.6-116.4 | | |
| Chromium | 85.1 | | 2.11 | mg/kg wet | 77.200 | | 110 | 73.3-126.4 | | |
| Lead | 191 | | 2.11 | mg/kg wet | 190.00 | | 100 | 81.6-118.4 | | |
| Selenium | 197 | | 2.11 | mg/kg wet | 187.00 | | 105 | 75.9-124.6 | | |
| Silver | 87.6 | | 2.11 | mg/kg wet | 83.500 | | 105 | 82.7-117.1 | | |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

# TCLP Metals by SW846 1311 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 L106016 - SW 3005A** | | | | | | | | | | |
| **Blank (L106016-BLK1)** | | | | Prepared: 06/02/2011 Analyzed: 06/04/2011 | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | | | | | | |
| Barium | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Chromium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Lead | 0.0300 | U | 0.0300 | mg/L | | | | | | |
| Selenium | 0.0500 | U | 0.0500 | mg/L | | | | | | |
| Silver | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Uranium | 0.300 | U | 0.300 | mg/L | | | | | | |
| **Blank (L106016-BLK2)** | | | | Prepared: 06/02/2011 Analyzed: 06/04/2011 | | | | | | |
| Arsenic | 0.0300 | U | 0.0300 | mg/L | | | | | | |
| Barium | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Chromium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Lead | 0.0300 | U | 0.0300 | mg/L | | | | | | |
| Selenium | 0.0500 | U | 0.0500 | mg/L | | | | | | |
| Silver | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Uranium | 0.300 | U | 0.300 | mg/L | | | | | | |
| **LCS (L106016-BS1)** | | | | Prepared: 06/02/2011 Analyzed: 06/04/2011 | | | | | | |
| Arsenic | 8.89 | | 0.0300 | mg/L | 10.000 | | 88.9 | 80-120 | | 20 |
| Barium | 4.37 | | 0.00500 | mg/L | 5.0000 | | 87.3 | 80-120 | | 20 |
| Cadmium | 0.220 | | 0.00300 | mg/L | 0.25000 | | 88.1 | 80-120 | | 20 |
| Chromium | 0.452 | | 0.00300 | mg/L | 0.50000 | | 90.5 | 80-120 | | 20 |
| Lead | 2.22 | | 0.0300 | mg/L | 2.5000 | | 89.0 | 80-120 | | 20 |
| Selenium | 8.78 | | 0.0500 | mg/L | 10.000 | | 87.8 | 80-120 | | 20 |
| Silver | 0.458 | | 0.00500 | mg/L | 0.50000 | | 91.5 | 80-120 | | 20 |
| Uranium | 4.24 | | 0.300 | mg/L | 5.0000 | | 84.8 | 80-120 | | 20 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 06/20/2011 15:29 |

## TCLP Metals by SW846 1311 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 L106016 - SW 3005A** | | | | | | | | | |
| **Matrix Spike (L106016-MS1)** | | **Source: 1105007-18** | Prepared: 06/02/2011 Analyzed: 06/04/2011 | | | | | | |
| Arsenic | 4.71 | 0.150 | mg/L | 5.0000 | 0.0300 U | 94.2 | 50-1000 | | 20 |
| Barium | 51.8 | 0.0250 | mg/L | 100.00 | 0.0464 | 51.8 | 50-1000 | | 20 |
| Cadmium | 0.952 | 0.0150 | mg/L | 1.0000 | 0.00300 U | 95.2 | 50-1000 | | 20 |
| Chromium | 4.81 | 0.0150 | mg/L | 5.0000 | 0.00300 U | 96.3 | 50-1000 | | 20 |
| Lead | 4.90 | 0.150 | mg/L | 5.0000 | 0.0300 U | 98.1 | 50-1000 | | 20 |
| Selenium | 0.894 | 0.250 | mg/L | 1.0000 | 0.0500 U | 89.4 | 50-1000 | | 20 |
| Silver | 4.46 | 0.0250 | mg/L | 5.0000 | 0.00500 U | 89.2 | 50-1000 | | 20 |
| Uranium | 4.56 | 1.50 | mg/L | 5.0000 | 0.300 U | 91.2 | 50-1000 | | 20 |

**Lionville Laboratory** Logbook #: 963

## SAMPLE DIGESTION RECORD

Digestion Batch #: L105215
Date/Time Initiated: 5/17/11 1055
Date/Time Completed: 5/17/11 1650
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 97
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1105007-01 | | 0.73 | 50 | | TO | Fine | Black | Rocks | N/A |
| * L105215-MS1 | 0.5 | 0.53 | 50 | | | | | | |
| 1105007-02 | | 0.59 | 50 | | | | | | |
| -03 | | 0.62 | 50 | | | | | | |
| -04 | | 0.59 | 50 | | | | | | |
| -05 | | 0.57 | 50 | | | Fine | Black | Rocks | |
| -06 | | 0.65 | 50 | | | | | | |
| -07 | | 0.74 | 50 | | | | | | |
| -08 | | 0.70 | 50 | | | | | | |
| -09 | | 0.78 | 50 | | | Fine | Black | Rocks | |
| -10 | | 0.74 | 50 | | | | | | |
| -11 | | 0.72 | 50 | | | | | | |
| -12 | | 0.67 | 50 | | | | | | |
| -13 | | 0.67 | 50 | | | Fine | Black | Rocks | |
| -14 | | 0.69 | 50 | | | | | | |
| -15 | | 0.74 | 50 | | | | | | |
| -16 | | 0.51 | 50 | | | | | | |
| L105215-BLK1 | | 0.70 | 50 | | | Coarse | Boiling Chips | | |
| -SPK1 | A | 0.71 | 50 | | | Fine | dusty pink sand | | |

JJS 5/17/11

Spiking IDs / Expiration Date:
MS#: 1001843
LCS# A 1100103

Reagent IDs:
$HNO_3$ K09041
HCl K12096
$H_2O_2$ J52A01
1:1 $HNO_3$ 637-041-05
1:1 HCl

File ID#:

Data Review By / Date: Qem 5/18/11

R:\group\QA\SOP\Signed\SPI\Metals Digestion log.doc

*: 6072-09-16 250 ml

Page #:

Lionville Laboratory

Logbook #: 971

# SAMPLE DIGESTION RECORD

Digestion Batch #: L106016
Date/Time Initiated: 6/2/11 1055
Date/Time Completed: 6/2/11 1620
Analyst: JS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: N/A
Balance Cal Verification: Y NA
Temp: 99
BLOCK 1 2 (circle one)

c/c-clear/colorless

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/ TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1105007-17 | | 10 | 50 | | TO | N/A | c/c | N/A | N/A |
| -18 | | 50 | 50 | | | | c/c | | |
| * L106016 MS1 | 0.5 | 50 | 50 | | | | | | |
| 1105007-19 | | 50 | 50 | | | | c/c | | |
| -20 | | 50 | 50 | | | | c/c | | |
| -21 | | 50 | 50 | | | | c/c | | |
| -22 | | 50 | 50 | | | | c/c | | |
| -23 | | 50 | 50 | | | | c/c | | |
| -24 | | 50 | 50 | | | | c/c | | |
| -25 | | 50 | 50 | | | | c/c | | |
| -26 | | 50 | 50 | | | | c/c | | |
| -27 | | 50 | 50 | | | | c/c | | |
| -28 | | 50 | 50 | | | | c/c | | |
| -29 | | 10 | 50 | | | | c/c | | |
| -30 | | 50 | 50 | | | | c/c | | |
| -31 | | 50 | 50 | | | | c/c | | |
| -32 | | 50 | 50 | | | | c/c | | |
| L106016 BLK1 | | 50 | 50 | | | | c/c | | |
| * BS1 | 0.5 | 50 | 50 | | | | c/c | | |
| † BLK2 | | 50 | 50 | | | | c/c | | |
| | | | | | | | | JS 6/2/11 | |

Spiking IDs / Expiration Date:
MS#: 1100338
1100217
LCS#: 1100240

Reagent IDs:
$HNO_3$ K09041
HCl K14054
$H_2O_2$
1:1 $HNO_3$
1:1 HCl

File ID#:

Data Review By/Date: 6/6/11

R:\group\QA\SOP\
Signed\SPI\Metals Digestion log.doc

†: Associated with L105196
*: 6072-091-16 25ml

Page #: 17

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**Lionville Laboratory**

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 966

| | | |
|---|---|---|
| Start Date: 5-16-11<br>Start Time: 13:30<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 5-17-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L105196<br>Leachate Page: 1 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-17<br>Client ID#: ~~JIH~~ JIHJ08-A1<br>pH After 5 Min: 7.74 RH 5/16/11<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 6.62 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-18<br>Client ID#: JIHJ08-B1<br>pH After 5 Min: 7.74<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 6.47 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: _____ |
| LvL # 1105007-19<br>Client ID#: JIHJ08-B2<br>pH After 5 Min: 7.74<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 6.44 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-20<br>Client ID#: JIHJ08-C1<br>pH After 5 Min: 7.74<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 6.41 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: _____ |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date RCC 5/26/11

SPI-1311.1-A-0310

Page #



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Lionville Laboratory

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 966

| | | |
|---|---|---|
| Start Date: 5-16-11<br>Start Time: 13:30<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 5-17-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L105196<br>Leachate Page: 2 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-21<br>Client ID#: JIHJ09-A1<br>pH After 5 Min: 9.05<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 8.48 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-22<br>Client ID#: JIHJ09-B1<br>pH After 5 Min: 9.05<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 8.70 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL # 1105007-23<br>Client ID#: JIHJ09-C1<br>pH After 5 Min: 9.05<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 8.86 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-24<br>Client ID#: JIHJ09-C2<br>pH After 5 Min: 9.05<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 8.93 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [illegible] 5/16/11

SPI-1311.1-A-0310

Page #

Lionville Laboratory

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 966

| | | |
|---|---|---|
| Start Date: 5-16-11<br>Start Time: 13:30<br>Analyst: RM<br>SOP: SPI-1311.1 | End Date: 5-17-11<br>End Time: 7:00<br>Analyst: RM<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L105196<br>Leachate Page: 3 of 5<br>Room Temp. (°C):<br>Start 21 /Finish<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-25<br>Client ID#: JIHHXO-A1<br>pH After 5 Min: 9.28<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 8.35 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-26<br>Client ID#: JIHHXO-A2<br>pH After 5 Min: 9.28<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 8.29 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL # 1105007-27<br>Client ID#: JIHHXO-B1<br>pH After 5 Min: 9.28<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 8.47 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-28<br>Client ID#: JIHHXO-C1<br>pH After 5 Min: 9.28<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 8.66 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [illegible] 5/26/11

SPI-1311.1-A-0310

Page #

**Lionville Laboratory**

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 966

| | | |
|---|---|---|
| Start Date: 5-16-11<br>Start Time: 13:30<br>Analyst:: RH<br>SOP: SPI-1311.1 | End Date: 5-17-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L105196<br>Leachate Page: 4 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-29<br>Client ID#: JIHHX8-A1<br>pH After 5 Min: 9.06<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 8.36 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-30<br>Client ID#: JIHHX8-B1<br>pH After 5 Min: 9.06<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 8.16 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL # 1105007-31<br>Client ID#: JIHHX8-B2<br>pH After 5 Min: 9.06<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 8.09 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |
| LvL #: 1105007-32<br>Client ID#: JIHHX8-C1<br>pH After 5 Min: 9.06<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 8.13 | Initial Filtration Data and Comments:<br>Solids: _____% / NA<br>Initial Filtrate Added: _____ |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [illegible] 5/26/11

**Lionville Laboratory**

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 966

| | | |
|---|---|---|
| Start Date: 5-16-11<br>Start Time: 13:30<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 5-17-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L105196<br>Leachate Page: 5 of 5<br>Room Temp. (°C):<br>Start 20 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: L105196<br>Client ID#: N/A<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>BLANK<br>Initial Filtrate Added: |
| LvL #:<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA 5/16/11<br>Initial Filtrate Added: |
| LvL #:<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>RH<br>Initial Filtrate Added: |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [illegible] 5/16/11

SPI-1311.1-A-0310

Page #

Lionville Laboratory Use Only: 1105007

# Custody Transfer Record/Lab Work Request



Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: WC. Hanford SAFA RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Alletta Johnson
QC: SW  Del: STD  TAT: 21 Days
Date Rec'd: 5-3-11  Date Due: 5-24-11

| Refrigerator # | | A-D | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | 4pl | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | 1L | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | Special Extract | | INORG: Metal | CN | | | | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix * | Date Collected | Time Collected | Lionville Laboratory Use Only | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1HJ08-1 | | | Soil | 4-26-11 | 0905 | | | | | X | | X | | | | | |
| 02 | 2 | | | | | | | | | | X | | X | | | | | |
| 03 | 3 | | | | | | | | | | X | | X | | | | | |
| 04 | 4 | | | | | | | | | | X | | X | | | | | |
| 05 | J1HJ09-1 | | | | 4-27-11 | 0840 | | | | | X | | X | | | | | |
| 06 | 2 | | | | | | | | | | X | | X | | | | | |
| 07 | 3 | | | | | | | | | | X | | X | | | | | |
| 08 | 4 | | | | | | | | | | X | | X | | | | | |
| 09 | J1HHX0-1 | | | | 4-27-11 | ~~0835~~ 0835 | 05/13/11 | | | | X | (2) | X | | | | | |
| 10 | 2 | | | | | | | | | | X | | X | | | | | |

Special Instructions:
Caution
Potential Beryllium Contamination

Special Instructions:
1. * Matrix (Soil) = Ash.
2. 5/16/11 samples in for Total + TCLP RCRA 6010 + U - only (no Hg)
3.
4. 6/20/11 Samples -01 thru -08 and -17 thru 24 are reported; per client other
5. samples are on hold osj
6.

See SRC

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | | |
| | | | |

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Lionville Laboratory Use Only

1105007

# Custody Transfer Record/Lab Work Request

Page 2 of 4

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF RC-214

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#: Pg 1

Lionville Laboratory Project Manager: Arlette Johnson

QC: Del: TAT:

Date Rec'd: 5-3-11 Date Due:

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | A-D | 2 | | | | | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | | 4pl | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | | 1L | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Specific Gravity | | | Metal | CN | Leachate | | | | | |
| Lionville Laboratory Use Only | | | | | | 5/6/11 | | | 6010 RCRA+4 | | TCLP RCRA+4 | | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | J1HHX0-3 | | | Other SO | 4-27-11 | 0835 | | | | | X | | X | | | | | | | | |
| 12 | 4 | | | | | | | | | | X | | X | | | | | | | | |
| 13 | J1HHX8-1 | | | S | 4-25-11 | 1415 | | | | | X | | X | | | | | | | | |
| 14 | 2 | | | | | | | | | | X | | X | | | | | | | | |
| 15 | 3 | | | | | | | | | | X | | X | | | | | | | | |
| 16 | 4 | | | | | | | | | | X | | X | | | | | | | | |
| 17 | J1H508-A1 | | | | 4-26-11 | 0905 | | | | | | | | | | X | | | | | |
| 18 | B1 | | | | | | | | | | | | | | | X | | | | | |
| 19 | B2 | | | | | | | | | | | | | | | X | | | | | |
| 20 | C1 | | | | | | | | | | | | | | | X | | | | | |

**Special Instructions:**

**Special Instructions:**

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Lionville Laboratory Use Only |
|---|
| 1105007 |

# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC HANFORD RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#: See Pg 1
Lionville Laboratory Project Manager:
QC: 5 Del: TAT:
Date Rec'd: 5-3-11 Date Due:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Isotopes

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only: TCLP RCRA4 |
|---|---|---|---|---|---|---|---|
| 21 | JH509-A1 | | | Oily Solid | 4-27-11 | 0840 | X |
| 22 | B1 | | | | | | X |
| 23 | C1 | | | | | | X |
| 24 | C2 | | | | | | X |
| 25 | JHHX0-A1 | | | | | 0835 | X |
| 26 | A2 | | | | | | X |
| 27 | B1 | | | | | | X |
| 28 | C1 | | | | | | X |
| 29 | JHHX8-A1 | | | | 4-25-11 | 1415 | X |
| 30 | B1 | | | | | | X |

Special Instructions:

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

Lionville Laboratory Use Only

1105007

# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC HANFORD RC-214

Est. Final Proj. Sampling Date:

Project#: Pg 1

Project Contact/Phone#:

Lionville Laboratory Project Manager:

QC: Del: TAT:

Date Rec'd: 5-3-11 Date Due:

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | | | | | | | | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | | |
| | Solid | | | | | | | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | | |
| | Solid | | | | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | Metal | CN | Leachate | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | | |
| | | | | | | | | | | | TCLP RCRA HL | | | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | J1HH8-B2 | | | Other Solid | 4-25-11 | 1415 | | | | | | | | | X | | | | | | |
| 32 | 2 e1 | | | 1 | 1 | 1 | | | | | | | | | X | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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Special Instructions:

Special Instructions:

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-29 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | | SAF No.: RC-214 |
| Ice Chest No.: 6W5-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES/ LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: 7970 5197 2441 |

Shipped To: EBERLINE SERVICES/ LIONVILLE

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

**Special Handling and/or Storage**

*Tie to RAD Screen J1HJ06*

Bill of Lading/Air Bill No.: See ~~OSPC~~ 7970 5197 2441 LW. 5/2/11

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 1mL | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 (K 4-22-11) | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J1HJ08 | OTHER | 4/26/11 | 0905 | X | X | X | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse KB Hulse | 4-26-11 1300 | Received By/Stored In: SSU- 1 | 4-26-11 1300 |
| Relinquished By/Removed From: SSU #1 | 5/2/11 1100 | Received By/Stored In: L.D. Wall OHPRC L.D. Wall | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall OHPRC L.D. Wall | 5/2/11 1400 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: [illegible] | 5-3-11 1050 | Received By/Stored In: [illegible] | 5-3-11 1050 |
| 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, Uranium, 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

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-30 | Page 1 of 1 |
|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER<br>Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C<br>Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658<br>COA: BESCAS | Method of Shipment: FedEx 7970 5197 2441 | |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 258S | Bill of Lading/Air Bill No.: ~~See OSPC~~ 5/2/11 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 - ~~8310~~ 8220 PS 5-28-11 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
| J1HJ09 | OTHER | 4-27-11 | 0840 | X | X | X | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| D Sparks | 4-28-11/0700 | SSU 1 | 4-28-11/0700 |
| SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | |
| FedEx | 5-3-11 1050 | | 5-31-11/1050 |
| 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, Uranium, 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
Wl=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-214-21 | Page 1 of 1 |
|---|---|---|---|
| Collector: KB Hulse D Sparling | Company Contact: JOAN KESSNER; Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C; Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658; COA: BESCAS | Method of Shipment: FedEx | |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: ~~See OSRC~~ 7970 5197 2441 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | ~~70mL~~ 125 | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | J1HHW9 | OTHER | 4-26-11 | 0955 | X | | | | | | | | | |
| 17 | J1HHX0 | OTHER | 4-27-11 | 0835 | X | X | X | | | | | | | |
| 18 | J1HHX1 | OTHER | 4-27-11 | 1230 | X | | | | | | | | | |
| 19 | J1HHX2 | OTHER | | | | | | | | | | | | |
| 20 | J1HHX3 | OTHER | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From: ~~J Sedes~~ | ~~4-27-11 / 0700~~ | ~~SSU-1~~ | |
| Relinquished By/Removed From: SSU-1 | 4/27/11 / 0700 | L.D. Wall CHPRC | 4-27-11/0700 |
| Relinquished By/Removed From: L.D. Wall CHPRC | 4/28/11/0700 | SSU-1 | 4-28-11/0700 |
| Relinquished By/Removed From: SSU#1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | 5-3-11/1050 |

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, Uranium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}

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: FEDEX 5-3-11/1050 | 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-214-22 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | | SAF No.: RC-214 |
| Ice Chest No.: GW5826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~See OSPC~~ 7970 5197 2441 |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 1 | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | 0mL | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | J1HHX4 | OTHER | 4/25/11 | 1345 | X | | | | | | | | | |
| 22 | J1HHX5 | OTHER | 4/26/11 | 0930 | X | | | | | | | | | |
| 23 | J1HHX6 | OTHER | 4/26/11 | 0935 | X | | | | | | | | | |
| 24 | J1HHX7 | OTHER | 4/26/11 | 0920 | X | | | | | | | | | |
| 25 | J1HHX8 | OTHER | 4/25/11 | 1415 | X | X | X | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From: SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| Relinquished By/Removed From: L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | |
| Relinquished By/Removed From: FedEx | 5-3-11 1050 | D. Smith | 5-3-11 1050 |
| 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, Uranium, Vanadium, Zinc}: Mercury - 7471 - (CV) {Mercury}

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

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hanford
Project/SAF/SOW/Release #: RC-214

Date: 5-3-11

LvL Batch #: 1105007

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FedEx | | Airbill # 7970 5197 2441 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 3.4 | °C | Cooler # GWS-826 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☐ Yes | ☐ No | ☑ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

10 October 2011

RECEIVED
OCT 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1105007 |
| SDG # | K3346 SPEC EXT/ ADD-ON |
| SAF # | RC-214 |
| Date Received | 05/03/11 |
| # Samples | 2 |
| Matrix | OTHER SOLID |
| Volatiles | |
| Semivolatiles | |
| Pest/PCB | |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | |
| Metals | X |
| Inorganics | |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

RECEIVED
OCT 2011

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | Reported:<br>10/07/2011 08:44 |

## Analytical Report for Metals by SW846 6000/7000 series

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1HJ08-1 | 1105007-01 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-2 | 1105007-02 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-3 | 1105007-03 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-4 | 1105007-04 | Other Solid | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09-1 | 1105007-05 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-2 | 1105007-06 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-3 | 1105007-07 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-4 | 1105007-08 | Other Solid | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ08-A1 | 1105007-17 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-B1 | 1105007-18 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-B2 | 1105007-19 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ08-C1 | 1105007-20 | Leachate | 04/26/2011 09:05 | 05/03/2011 10:50 |
| J1HJ09-A1 | 1105007-21 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-B1 | 1105007-22 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-C1 | 1105007-23 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |
| J1HJ09-C2 | 1105007-24 | Leachate | 04/27/2011 08:40 | 05/03/2011 10:50 |

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#:** 1105007
**SDG/SAF#:** K3346/RC-214

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 05-03-11

## 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 2 other solid samples analyzed in quadruplicate and 8 TCLP leachate samples.

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

   All TCLP leachate samples for ICP metals were reported with the suffix RE1.

   TCLP leachate samples J1HJ08-A1 and J1HJ09-A1 were prepared with 10-fold dilutions for ICP and Mercury analyses due to insufficient sample volume.

3. All analyses were performed within the required holding times with the exception of Mercury. The Mercury analysis was performed outside the required holding time. The TCLP procedure for Mercury was performed outside the required holding time. The analyses of all leachates 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% Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, MB value less than 5% of the RCRA limit, samples were greater than 20X MB value} with the exception of L110017-BLK1 for Chromium and Lead.

   a). The samples for Chromium and Lead were reported herein "uncorrected" for the levels found


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 52 pages.

in the MB as per the project manager.

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. All laboratory control samples (LCS) were within the 80-120% control limits.

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

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

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| J1HJ08-1 | Antimony | 100 | 110.2 |
| | Barium | 2,100 | 85.2 |
| | Beryllium | 100 | 117.5 |
| | Chromium | 100 | 111.9 |
| | Copper | 100 | 118.2 |
| | Lead | 100 | 107.4 |
| | Manganese | 1,000 | 88.7 |
| | Nickel | 100 | 113.0 |
| | Thallium | 100 | 101.1 |
| | Vanadium | 1,000 | 94.7 |

12. The TCLP extract from sample J1HJ08-C1 was selected for the matrix spike (MS) for this analytical batch.

    The MS recoveries for all analytes in the TCLP extract were above 50%.

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

10/8/11
Date

alm/05-007specext

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| B | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag) |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-1
### 1105007-01 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.657 | U | 0.657 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **11.1** | | 1.10 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **1790** | | 0.548 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.65** | | 0.219 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **69.1** | | 2.19 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.268** | | 0.219 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **14.1** | | 0.219 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **6.74** | | 2.19 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **38.5** | | 1.10 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **8.17** | | 0.548 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **269** | | 5.48 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **2.90** | | 2.19 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **15.7** | | 4.38 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **1.32** | | 0.329 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.219 | U | 0.219 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.548 | U | 0.548 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 21.9 | U | 21.9 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **52.0** | | 2.74 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **31.1** | | 11.0 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0378** | | 0.0331 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-2
### 1105007-02 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.635 | U | 0.635 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **9.25** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **2030** | | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.82** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **166** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.232** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **10.3** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **6.43** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **31.5** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **5.38** | | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **175** | | 5.29 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **2.43** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **13.8** | | 4.23 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **0.823** | | 0.317 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.212 | U | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.529 | U | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 21.2 | U | 21.2 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **49.5** | | 2.65 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **20.7** | | 10.6 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0457** | | 0.0331 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-214<br>Project Number: K3346<br>Project Manager: Joan Kessner | Reported:<br>10/07/2011 08:44 |

## J1HJ08-3
### 1105007-03 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.434** | B | 0.635 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **8.86** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **1500** | | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.43** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **56.8** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.244** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **11.0** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **5.44** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **30.6** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **6.73** | | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **228** | | 5.29 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **2.27** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **13.1** | | 4.23 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **1.39** | | 0.317 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.212 | U | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.529 | U | 0.529 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 21.2 | U | 21.2 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **41.4** | | 2.65 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **27.8** | | 10.6 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0369** | | 0.0331 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-4
## 1105007-04 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| **Antimony** | **0.397** | B | 0.720 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **11.1** | | 1.20 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **1720** | | 0.600 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.52** | | 0.240 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **57.2** | | 2.40 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.282** | | 0.240 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **13.7** | | 0.240 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **6.49** | | 2.40 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **34.3** | | 1.20 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **7.09** | | 0.600 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **254** | | 6.00 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **3.32** | | 2.40 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **15.2** | | 4.80 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **1.47** | | 0.360 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.240 | U | 0.240 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.600 | U | 0.600 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 24.0 | U | 24.0 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **47.3** | | 3.00 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **31.3** | | 12.0 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0367** | | 0.0321 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-1
### 1105007-05 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.636 | U | 0.636 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **2.66** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **910** | | 0.530 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.98** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **352** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.163** | B | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **14.9** | | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **3.31** | | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **25.7** | | 1.06 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **6.94** | | 0.530 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **52.0** | | 5.30 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **1.60** | B | 2.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **9.21** | | 4.24 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **0.343** | | 0.318 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.212 | U | 0.212 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.530 | U | 0.530 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 21.2 | U | 21.2 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **37.4** | | 2.65 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **19.4** | | 10.6 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0332** | | 0.0314 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-2
## 1105007-06 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.614 | U | 0.614 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **2.57** | | 1.02 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **866** | | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.88** | | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **317** | | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.188** | B | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **15.1** | | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **3.13** | | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **26.6** | | 1.02 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **7.00** | | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **46.8** | | 5.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **1.52** | B | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **8.90** | | 4.09 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Selenium | 0.307 | U | 0.307 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.205 | U | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.512 | U | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 20.5 | U | 20.5 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **34.3** | | 2.56 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **22.2** | | 10.2 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0354** | | 0.0314 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-3
### 1105007-07 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.614 | U | 0.614 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **2.41** | | 1.02 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **766** | | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.76** | | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **300** | | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.138** | B | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **13.3** | | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **2.88** | | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **23.3** | | 1.02 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **7.08** | | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **37.8** | | 5.12 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **1.31** | B | 2.05 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **8.22** | | 4.09 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Selenium** | **0.339** | | 0.307 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.205 | U | 0.205 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.512 | U | 0.512 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 20.5 | U | 20.5 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **32.2** | | 2.56 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **22.5** | | 10.2 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0372** | | 0.0314 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-4
### 1105007-08 (Other Solid)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **Metals by SW846 6000/7000 series** | | | | | | | | | |
| Antimony | 0.584 | U | 0.584 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Arsenic** | **2.14** | | 0.973 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Barium** | **732** | | 0.487 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Beryllium** | **1.65** | | 0.195 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Boron** | **275** | | 1.95 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cadmium** | **0.128** | B | 0.195 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Chromium** | **11.4** | | 0.195 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Cobalt** | **2.75** | | 1.95 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Copper** | **21.3** | | 0.973 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Lead** | **5.04** | | 0.487 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Manganese** | **43.5** | | 4.87 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Molybdenum** | **1.28** | B | 1.95 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Nickel** | **7.52** | | 3.89 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Selenium | 0.292 | U | 0.292 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Silver | 0.195 | U | 0.195 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Thallium | 0.487 | U | 0.487 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| Uranium | 19.5 | U | 19.5 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Vanadium** | **29.2** | | 2.43 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Zinc** | **15.8** | | 9.73 | mg/kg dry | 1 | L110017 | 10/03/2011 | 10/05/2011 | 6010B |
| **Mercury** | **0.0416** | | 0.0297 | mg/kg dry | 1 | L110016 | 10/03/2011 | 10/04/2011 | 7471A |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-A1

### 1105007-17 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.00200 | U | 0.00200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-A1
### 1105007-17RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.150 | U | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0352** | | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.0300 | U | 0.0300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Chromium | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.100 | U | 0.100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.0600 | U | 0.0600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **2.55** | | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.0806** | | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.0121** | B | 0.0300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Nickel | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.150 | U | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 2.00 | U | 2.00 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0392** | B | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.500 | U | 0.500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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## J1HJ08-B1

### 1105007-18 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-B1
## 1105007-18RE1 (Leachate)

### Lionville Laboratory

**TCLP Metals by SW846 1311 6000/7000 series**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0336** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Chromium | 0.00500 | U | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **1.55** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.0378** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.00769** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Nickel** | **0.000506** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0173** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-B2

### 1105007-19 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ08-B2
## 1105007-19RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0332** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Chromium | 0.00500 | U | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Selenium** | **0.00336** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **1.48** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.0359** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.00763** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Nickel | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0166** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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## J1HJ08-C1

### 1105007-20 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
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## J1HJ08-C1
## 1105007-20RE1 (Leachate)

### Lionville Laboratory

**TCLP Metals by SW846 1311 6000/7000 series**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0394** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Chromium | 0.00500 | U | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **1.06** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.0225** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.00799** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Nickel** | **0.000524** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0151** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-A1

### 1105007-21 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.00200 | U | 0.00200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-A1
## 1105007-21RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Lionville Laboratory** | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Arsenic | 0.150 | U | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0350** | | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.0300 | U | 0.0300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Chromium | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.100 | U | 0.100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.0600 | U | 0.0600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **5.66** | | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Manganese | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.0349** | | 0.0300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Nickel | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.150 | U | 0.150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 2.00 | U | 2.00 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0347** | B | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.500 | U | 0.500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

**J1HJ09-B1**
**1105007-22 (Leachate)**

**Lionville Laboratory**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-B1
## 1105007-22RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **0.00336** | B | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0374** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Chromium** | **0.00302** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Selenium** | **0.00309** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **3.93** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.00122** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.0106** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Nickel | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0374** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-C1

### 1105007-23 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-C1

### 1105007-23RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **0.00326** | B | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0255** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Chromium** | **0.00187** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **2.36** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.000862** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.00568** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Nickel** | **0.000544** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0318** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-C2
## 1105007-24 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | 1 | L110012 | 10/03/2011 | 10/05/2011 | 7470 |

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|---|---|---|
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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## J1HJ09-C2
### 1105007-24RE1 (Leachate)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **TCLP Metals by SW846 1311 6000/7000 series** | | | | | | | | | |
| **Arsenic** | **0.00310** | B | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Barium** | **0.0267** | | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Chromium** | **0.00184** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Lead | 0.0100 | U | 0.0100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Selenium | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Silver | 0.00600 | U | 0.00600 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Antimony | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Boron** | **2.23** | | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Copper | 0.0200 | U | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Manganese** | **0.000852** | B | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Molybdenum** | **0.00587** | | 0.00300 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Nickel** | **0.000508** | B | 0.0200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Thallium | 0.0150 | U | 0.0150 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Uranium | 0.200 | U | 0.200 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| **Vanadium** | **0.0301** | | 0.00500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |
| Zinc | 0.0500 | U | 0.0500 | mg/L | 1 | L110011 | 06/02/2011 | 10/04/2011 | 6010 |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## 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 L110016 - SW 7471A Prep** | | | | | | | | | | |
| **Blank (L110016-BLK1)** | | | | Prepared: 10/03/2011 Analyzed: 10/04/2011 | | | | | | |
| Mercury | 0.0281 | U | 0.0281 | mg/kg wet | | | | | | |
| **Matrix Spike (L110016-MS2)** | | Source: 1105007-01 | | Prepared: 10/03/2011 Analyzed: 10/04/2011 | | | | | | |
| Mercury | 0.250 | | 0.0331 | mg/kg dry | 0.18361 | 0.0378 | 115 | 75-125 | | |
| **Reference (L110016-SRM1)** | | | | Prepared: 10/03/2011 Analyzed: 10/04/2011 | | | | | | |
| Mercury | 1.26 | | 0.0281 | mg/kg wet | 1.2900 | | 97.7 | 62.6-138 | | |
| **Batch L110017 - SW 3050B** | | | | | | | | | | |
| **Blank (L110017-BLK1)** | | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Antimony | 0.566 | U | 0.566 | mg/kg wet | | | | | | |
| Arsenic | 0.943 | U | 0.943 | mg/kg wet | | | | | | |
| Barium | 0.472 | U | 0.472 | mg/kg wet | | | | | | |
| Beryllium | 0.189 | U | 0.189 | mg/kg wet | | | | | | |
| Boron | 1.89 | U | 1.89 | mg/kg wet | | | | | | |
| Cadmium | 0.189 | U | 0.189 | mg/kg wet | | | | | | |
| Chromium | 0.288 | | 0.189 | mg/kg wet | | | | | | |
| Cobalt | 1.89 | U | 1.89 | mg/kg wet | | | | | | |
| Copper | 0.943 | U | 0.943 | mg/kg wet | | | | | | |
| Lead | 0.642 | | 0.472 | mg/kg wet | | | | | | |
| Manganese | 4.72 | U | 4.72 | mg/kg wet | | | | | | |
| Molybdenum | 1.89 | U | 1.89 | mg/kg wet | | | | | | |
| Nickel | 3.77 | U | 3.77 | mg/kg wet | | | | | | |
| Selenium | 0.283 | U | 0.283 | mg/kg wet | | | | | | |
| Silver | 0.189 | U | 0.189 | mg/kg wet | | | | | | |
| Thallium | 0.472 | U | 0.472 | mg/kg wet | | | | | | |
| Uranium | 18.9 | U | 18.9 | mg/kg wet | | | | | | |
| Vanadium | 2.36 | U | 2.36 | mg/kg wet | | | | | | |
| Zinc | 9.43 | U | 9.43 | mg/kg wet | | | | | | |

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| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## 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 L110017 - SW 3050B** | | | | | | | | | |
| **Matrix Spike (L110017-MS2)** | | **Source: 1105007-01** | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Antimony | 21.0 | 0.707 | mg/kg dry | 58.895 | 0.657 U | 35.7* | 75-125 | | 20 |
| Arsenic | 205 | 1.18 | mg/kg dry | 235.58 | 11.1 | 82.3 | 75-125 | | 20 |
| Barium | 1680 | 0.589 | mg/kg dry | 235.58 | 1790 | -47.6* | 75-125 | | 20 |
| Beryllium | 5.97 | 0.236 | mg/kg dry | 5.8895 | 1.65 | 73.4* | 75-125 | | 20 |
| Boron | 167 | 2.36 | mg/kg dry | 117.79 | 69.1 | 83.0 | 75-125 | | 20 |
| Cadmium | 5.44 | 0.236 | mg/kg dry | 5.8895 | 0.268 | 87.7 | 75-125 | | 20 |
| Chromium | 28.4 | 0.236 | mg/kg dry | 23.558 | 14.1 | 60.9* | 75-125 | | 20 |
| Cobalt | 51.0 | 2.36 | mg/kg dry | 58.895 | 6.74 | 75.2 | 75-125 | | 20 |
| Copper | 53.2 | 1.18 | mg/kg dry | 29.448 | 38.5 | 50.0* | 75-125 | | 20 |
| Lead | 48.9 | 0.589 | mg/kg dry | 58.895 | 8.17 | 69.1* | 75-125 | | 20 |
| Manganese | 247 | 5.89 | mg/kg dry | 58.895 | 269 | -38.1* | 75-125 | | 20 |
| Molybdenum | 96.4 | 2.36 | mg/kg dry | 117.79 | 2.90 | 79.3 | 75-125 | | 20 |
| Nickel | 58.2 | 4.71 | mg/kg dry | 58.895 | 15.7 | 72.2* | 75-125 | | 20 |
| Selenium | 195 | 0.353 | mg/kg dry | 235.58 | 1.32 | 82.0 | 75-125 | | 20 |
| Silver | 4.82 | 0.236 | mg/kg dry | 5.8895 | 0.219 U | 81.8 | 75-125 | | 20 |
| Thallium | 167 | 0.589 | mg/kg dry | 235.58 | 0.548 U | 70.8* | 75-125 | | 20 |
| Uranium | 446 | 23.6 | mg/kg dry | 588.95 | 21.9 U | 75.8 | 75-125 | | 20 |
| Vanadium | 90.5 | 2.94 | mg/kg dry | 58.895 | 52.0 | 65.4* | 75-125 | | 20 |
| Zinc | 75.6 | 11.8 | mg/kg dry | 58.895 | 31.1 | 75.6 | 75-125 | | 20 |
| **Reference (L110017-SRM1)** | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Antimony | 47.0 | 1.67 | mg/kg wet | 53.000 | | 88.6 | 0-235.8 | | |
| Arsenic | 118 | 2.78 | mg/kg wet | 114.00 | | 103 | 82.8-117.54 | | |
| Barium | 312 | 1.39 | mg/kg wet | 307.00 | | 102 | 79.8-120.2 | | |
| Beryllium | 107 | 0.556 | mg/kg wet | 108.00 | | 99.2 | 82.8-117.6 | | |
| Boron | 82.6 | 5.56 | mg/kg wet | 85.100 | | 97.0 | 67.5-132.8 | | |
| Cadmium | 228 | 0.556 | mg/kg wet | 225.00 | | 101 | 83.6-116.4 | | |
| Chromium | 81.2 | 0.556 | mg/kg wet | 77.200 | | 105 | 73.3-126.4 | | |
| Cobalt | 166 | 5.56 | mg/kg wet | 166.00 | | 99.8 | 80.7-118.7 | | |
| Copper | 268 | 2.78 | mg/kg wet | 271.00 | | 98.8 | 80.8-119.2 | | |
| Lead | 190 | 1.39 | mg/kg wet | 190.00 | | 99.9 | 81.6-118.4 | | |
| Manganese | 927 | 13.9 | mg/kg wet | 965.00 | | 96.1 | 69.3-130.5 | | |
| Molybdenum | 242 | 5.56 | mg/kg wet | 235.00 | | 103 | 76.2-123.8 | | |
| Nickel | 225 | 11.1 | mg/kg wet | 221.00 | | 102 | 79.6-120.8 | | |
| Selenium | 192 | 0.833 | mg/kg wet | 187.00 | | 103 | 75.9-124.6 | | |
| Silver | 82.2 | 0.556 | mg/kg wet | 83.500 | | 98.5 | 82.7-117.1 | | |
| Thallium | 86.2 | 1.39 | mg/kg wet | 86.800 | | 99.4 | 77.3-122.1 | | |

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| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## 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 L110017 - SW 3050B** | | | | | | | | | |
| **Reference (L110017-SRM1)** | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Vanadium | 107 | 6.94 | mg/kg wet | 98.700 | | 108 | 75.9-123.6 | | |
| Zinc | 204 | 27.8 | mg/kg wet | 199.00 | | 102 | 78.4-121.6 | | |

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|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## TCLP Metals by SW846 1311 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 L110011 - SW 3005A** | | | | | | | | | | |
| **Blank (L110011-BLK1)** | | | | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Arsenic | 0.0150 | U | 0.0150 | mg/L | | | | | | |
| Barium | 0.00100 | U | 0.00100 | mg/L | | | | | | |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Chromium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Lead | 0.0100 | U | 0.0100 | mg/L | | | | | | |
| Selenium | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Silver | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Antimony | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | | | | | | |
| Boron | 0.0131 | B | 0.0150 | mg/L | | | | | | |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | | | | | | |
| Copper | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Manganese | 0.00177 | B | 0.00500 | mg/L | | | | | | |
| Molybdenum | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Nickel | 0.000561 | B | 0.0200 | mg/L | | | | | | |
| Thallium | 0.0150 | U | 0.0150 | mg/L | | | | | | |
| Uranium | 0.200 | U | 0.200 | mg/L | | | | | | |
| Vanadium | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Zinc | 0.0500 | U | 0.0500 | mg/L | | | | | | |
| **Blank (L110011-BLK2)** | | | | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Arsenic | 0.0150 | U | 0.0150 | mg/L | | | | | | |
| Barium | 0.00100 | U | 0.00100 | mg/L | | | | | | |
| Cadmium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Chromium | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Lead | 0.0100 | U | 0.0100 | mg/L | | | | | | |
| Selenium | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Silver | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Antimony | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Beryllium | 0.00100 | U | 0.00100 | mg/L | | | | | | |
| Boron | 0.00966 | B | 0.0150 | mg/L | | | | | | |
| Cobalt | 0.00200 | U | 0.00200 | mg/L | | | | | | |
| Copper | 0.0200 | U | 0.0200 | mg/L | | | | | | |
| Manganese | 0.00192 | B | 0.00500 | mg/L | | | | | | |
| Molybdenum | 0.00300 | U | 0.00300 | mg/L | | | | | | |
| Nickel | 0.000567 | B | 0.0200 | mg/L | | | | | | |
| Thallium | 0.0150 | U | 0.0150 | mg/L | | | | | | |

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: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

# TCLP Metals by SW846 1311 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 L110011 - SW 3005A** | | | | | | | | | | |
| **Blank (L110011-BLK2)** | | | | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Uranium | 0.200 | U | 0.200 | mg/L | | | | | | |
| Vanadium | 0.00500 | U | 0.00500 | mg/L | | | | | | |
| Zinc | 0.0500 | U | 0.0500 | mg/L | | | | | | |
| **LCS (L110011-BS1)** | | | | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Arsenic | 10.2 | | 0.0150 | mg/L | 10.000 | | 102 | 80-120 | | 20 |
| Barium | 4.97 | | 0.00100 | mg/L | 5.0000 | | 99.3 | 80-120 | | 20 |
| Cadmium | 0.264 | | 0.00300 | mg/L | 0.25000 | | 106 | 80-120 | | 20 |
| Chromium | 0.478 | | 0.00300 | mg/L | 0.50000 | | 95.7 | 80-120 | | 20 |
| Lead | 2.43 | | 0.0100 | mg/L | 2.5000 | | 97.2 | 80-120 | | 20 |
| Selenium | 10.2 | | 0.0200 | mg/L | 10.000 | | 102 | 80-120 | | 20 |
| Silver | 0.487 | | 0.00500 | mg/L | 0.50000 | | 97.4 | 80-120 | | 20 |
| Antimony | 3.12 | | 0.0200 | mg/L | 3.0000 | | 104 | 80-120 | | 20 |
| Beryllium | 0.242 | | 0.00100 | mg/L | 0.25000 | | 96.8 | 80-120 | | 20 |
| Boron | 5.10 | | 0.0150 | mg/L | 5.0000 | | 102 | 80-120 | | 20 |
| Cobalt | 2.45 | | 0.00200 | mg/L | 2.5000 | | 98.1 | 80-120 | | 20 |
| Copper | 1.27 | | 0.0200 | mg/L | 1.2500 | | 102 | 80-120 | | 20 |
| Manganese | 0.731 | | 0.00500 | mg/L | 0.75000 | | 97.4 | 80-120 | | 20 |
| Molybdenum | 5.02 | | 0.00300 | mg/L | 5.0000 | | 100 | 80-120 | | 20 |
| Nickel | 1.98 | | 0.0200 | mg/L | 2.0000 | | 99.0 | 80-120 | | 20 |
| Thallium | 9.93 | | 0.0150 | mg/L | 10.000 | | 99.3 | 80-120 | | 20 |
| Uranium | 4.74 | | 0.200 | mg/L | 5.0000 | | 94.7 | 80-120 | | 20 |
| Vanadium | 2.47 | | 0.00500 | mg/L | 2.5000 | | 98.8 | 80-120 | | 20 |
| Zinc | 1.01 | | 0.0500 | mg/L | 1.0000 | | 101 | 80-120 | | 20 |
| **Matrix Spike (L110011-MS2)** | | | Source: 1105007-20RE1 | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Arsenic | 1.84 | | 0.0150 | mg/L | 2.0000 | 0.0150 | U 91.8 | 50-1000 | | 20 |
| Barium | 1.83 | | 0.00100 | mg/L | 2.0000 | 0.0394 | 89.7 | 50-1000 | | 20 |
| Cadmium | 0.0466 | | 0.00300 | mg/L | 0.050000 | 0.00300 | U 93.3 | 50-1000 | | 20 |
| Chromium | 0.168 | | 0.00300 | mg/L | 0.20000 | 0.00500 | U 83.8 | 50-1000 | | 20 |
| Lead | 0.424 | | 0.0100 | mg/L | 0.50000 | 0.0100 | U 84.9 | 50-1000 | | 20 |
| Selenium | 1.79 | | 0.0200 | mg/L | 2.0000 | 0.0200 | U 89.4 | 50-1000 | | 20 |
| Silver | 0.0446 | | 0.00500 | mg/L | 0.050000 | 0.00600 | U 89.2 | 50-1000 | | 20 |
| Antimony | 0.457 | | 0.0200 | mg/L | 0.50000 | 0.0200 | U 91.4 | 50-1000 | | 20 |
| Beryllium | 0.0427 | | 0.00100 | mg/L | 0.050000 | 0.00100 | U 85.5 | 50-1000 | | 20 |
| Boron | 1.84 | | 0.0150 | mg/L | 1.0000 | 1.06 | 78.1 | 50-1000 | | 20 |
| Cobalt | 0.437 | | 0.00200 | mg/L | 0.50000 | 0.00200 | U 87.4 | 50-1000 | | 20 |
| Copper | 0.231 | | 0.0200 | mg/L | 0.25000 | 0.0200 | U 92.3 | 50-1000 | | 20 |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-214 | |
| 2620 Fermi Avenue | Project Number: K3346 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 10/07/2011 08:44 |

## TCLP Metals by SW846 1311 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 L110011 - SW 3005A** | | | | | | | | | | |
| **Matrix Spike (L110011-MS2)** | | | **Source: 1105007-20RE1** | Prepared & Analyzed: 10/04/2011 | | | | | | |
| Manganese | 0.436 | | 0.00500 | mg/L | 0.50000 | 0.0225 | 82.6 | 50-1000 | | 20 |
| Molybdenum | 0.900 | | 0.00300 | mg/L | 1.0000 | 0.00799 | 89.2 | 50-1000 | | 20 |
| Nickel | 0.434 | | 0.0200 | mg/L | 0.50000 | 0.000524 | 86.8 | 50-1000 | | 20 |
| Thallium | 1.70 | | 0.0150 | mg/L | 2.0000 | 0.0150 U | 85.0 | 50-1000 | | 20 |
| Uranium | 4.38 | | 0.200 | mg/L | 5.0000 | 0.200 U | 87.6 | 50-1000 | | 20 |
| Vanadium | 0.465 | | 0.00500 | mg/L | 0.50000 | 0.0151 | 90.0 | 50-1000 | | 20 |
| Zinc | 0.459 | | 0.0500 | mg/L | 0.50000 | 0.0500 U | 91.7 | 50-1000 | | 20 |
| **Batch L110012 - SW 7470A Prep** | | | | | | | | | | |
| **Blank (L110012-BLK1)** | | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | | | | | | |
| **Blank (L110012-BLK2)** | | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Mercury | 0.000200 | U | 0.000200 | mg/L | | | | | | |
| **LCS (L110012-BS1)** | | | | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Mercury | 0.00509 | | 0.000200 | mg/L | 0.0050606 | | 101 | 80-120 | | |
| **Matrix Spike (L110012-MS2)** | | | **Source: 1105007-20** | Prepared: 10/03/2011 Analyzed: 10/05/2011 | | | | | | |
| Mercury | 0.000957 | | 0.000200 | mg/L | 0.0010061 | 0.000200 U | 95.1 | 50-1000 | | |

Lionville Laboratory

Logbook #: 1008

# SAMPLE DIGESTION RECORD

Digestion Batch #: L110017
Date/Time Initiated: 10/4/11 1320
Date/Time Completed: 10/4/11 1750
Analyst: JS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: B29
Balance Cal Verification: Y NA
Temp: 99
BLOCK 1 2 (circle one)

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1105086-01 | | 0.58 | 50 | | TO | Coarse | Black/Brown | Rocks | N/A |
| * L110017-BMS1 | 0.5 | 0.54 | 50 | | | | | | |
| 1105086-02 | | 0.58 | 50 | | | | | | |
| 03 | | 0.58 | 50 | | | | | | |
| 04 | | 0.55 | 50 | | | | | | |
| 05 | | 0.54 | 50 | | | Coarse | Black/Brown | Rocks | |
| 06 | | 0.55 | 50 | | | | | | |
| 07 | | 0.53 | 50 | | | | | | |
| 08 | | 0.55 | 50 | | | | | | |
| 1105087-01 | | 0.57 | 50 | | | Coarse | Black/Brown | Rocks | |
| * L110017-MS2 | 0.5 | 0.53 | 50 | | | | | | |
| 1105087-02 | | 0.59 | 50 | | | | | | |
| 03 | | 0.59 | 50 | | | | | | |
| 04 | | 0.52 | 50 | | | | | | |
| 05 | | 0.56 | 50 | | | Coarse | Black/Brown | Rocks | |
| 06 | | 0.58 | 50 | | | | | | |
| 07 | | 0.58 | 50 | | | | | | |
| 08 | | 0.61 | 50 | | | | | | |
| L110017-BLK1 | | 0.53 | 50 | | | Coarse | Boiling Chips | | |
| SRM1 | 1 | 0.54 | 50 | | | Fine | dark brown/black | | |

JS 10/4/11

Spiking IDs / Expiration Date:
MS#: 1101064

LCS#: 1101357

Reagent IDs:
$HNO_3$ K19036
HCl K24090
$H_2O_2$ K03411
1:1 $HNO_3$ 637-050-01
1:1 HCl

File ID#:

Data Review By/Date: 10/5/11

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*6072-09-16 250ml

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Lionville Laboratory

Logbook #: 1008

# SAMPLE DIGESTION RECORD

Digestion Batch #: L110011
Date/Time Initiated: 10/3/11 1345
Date/Time Completed: 10/4/11 1130
Analyst: MW
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: N/A
Balance Cal Verification: Y NA
Temp: 99
BLOCK 1 2 (circle one)

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/ TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 1105006-09 | | 5 ⊖ | 50 | < | Ppt. sol | N/A | clear/colorless | N/A | N/A |
| 10 | | 5 ⊖ | 50 | < | | | | | |
| 11 | | 50 | 50 | < | | | | | |
| L110011-MS1 | 0.5* | 50 | 50 | < | | | | | |
| 1105006-12 | | 50 | 50 | < | | | | | |
| 13 | | 5 ⊖ | 50 | < | | | | | |
| 14 | | 50 | 50 | < | | | | | |
| 15 | | 50 | 50 | < | | | | | |
| 16 | | 50 | 50 | < | | | | | |
| 1105007-17 | | 5 ⊖ | 50 | < | | | | | |
| 18 | | 50 | 50 | < | | | | | |
| 19 | | 50 | 50 | < | | | | | |
| 20 | | 50 | 50 | < | | | | | |
| L110011-MS2 | 0.5* | 50 | 50 | < | | | | | |
| 1105007-21 | | 5 ⊖ | 50 | < | | | | | |
| 22 | | 50 | 50 | < | | | | | |
| 23 | | 50 | 50 | < | | | | | |
| 24 | | 50 | 50 | < | | | | | |
| L110011-BLK1 | | 50 | 50 | < | | | | | |
| * BLK2 | | 50 | 50 | < | | | | | |
| BS1 | 0.5 ⊖ | 50 | 50 | < | | | | | |

MW 10/3/11
JS 10/4/11

Spiking IDs / Expiration Date:
MS#: 1101064

LCS#: 1101020

Reagent IDs:
$HNO_3$ K14036
HCl K24040
$H_2O_2$
1:1 $HNO_3$
1:1 HCl

File ID#:

Data Review By/Date:
CLM 10/5/11

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Signed\SPT\Metals Digestion log.doc

* L109349-BLK1
⊖ limited volume

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Lionville Laboratory

# MERCURY PREPARATION

Logbook # 1009

Analyst: [illegible]
Date 10/3/11 – 10/4/11
Start Time/Temp: 1320 / 45°
End Time/Temp: 1353 / 47°

Instrument ID: Hg3.1
Balance # B29 /NA
Pipette Calibration (Daily) Y

Prep Batch: L110016
Worksheet: HG150401
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol. (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| blank | | | | 10ml | 50 | |
| 0.2 ug/l | | 0.100 | | 10ml | 50 | |
| 1.0 ug/l | | 0.500 | | 10ml | 50 | |
| 2.0 ug/l | | 1.000 | | 10ml | 50 | |
| 5.0 ug/l | | 2.500 | | 10ml | 50 | |
| 10.0 ug/l | | 5.000 | | 10ml | 50 | |
| ICV | | 0.125 | 2.5 | 10ml | 50 | |
| CCV | | 0.250 | 5.0 | 10ml | 50 | |
| ICB/CCB | | | | 10ml | 50 | |
| L110016-BLK1 | | | | 0.32 | 50 | |
| SRM1 | | | | 0.32 | 50 | |
| 1105006-01 | | | | 0.36 | 50 | |
| L110016-MS1 | | 0.500 | 1.0 | 0.33 | 50 | |
| 1105006-02 | | | | 0.38 | 50 | |
| 03 | | | | 0.39 | 50 | |
| 04 | | | | 0.37 | 50 | |
| 05 | | | | 0.32 | 50 | |
| 06 | | | | 0.35 | 50 | |
| 07 | | | | 0.34 | 50 | |
| 08 | | | | 0.35 | 50 | |
| 1105007-01 | | | | 0.34 | 50 | |
| L110016-MS2 | | 0.500 | 1.0 | 0.34 | 50 | |
| 1105007-02 | | | | 0.34 | 50 | |
| 03 | | | | 0.34 | 50 | |
| 04 | | | | 0.35 | 50 | |
| 05 | | | | 0.34 | 50 | |
| 06 | | | | 0.34 | 50 | |

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | RI 1101356B | 10/4/11 1030 |
| ICV/CCV/LCS | I.K 1101256A | 1 |

Reviewed By/Date: [illegible] 10/5/11

see book # 9368 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1101357

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 1009

Analyst: [illegible]
Date 10/3/11 — 10/4/11
Start Time/Temp: See page 020
End Time/Temp: See page 020

Instrument ID: HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) (Y) ____

Prep Batch: L110016
Worksheet: HG160401
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| 1105007-07 | | | | 0.34 | 50 | |
| 08 | | | | 0.36 | 50 | |

MW 10/4/11

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | See page 020 | |
| ICV/CCV/LCS | | |

Reviewed By/Date: [illegible] 10/5/11

Source book # 9368 for std traceability information

Soil LCS True Value = See page 020 mg/Kg
Standard # ____

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

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[illegible]

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 1009

Analyst: [illegible]
Date 10/3/11
Start Time/Temp: 1900/95°
End Time/Temp: 2100/97°

Instrument ID: HG3.1
Balance # (N/A)
Pipette Calibration (Daily) (Y)

Prep Batch: L110012
Worksheet: HG100501
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol. (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| blank | | | | 33 | 33 | |
| 0.2 ug/L | | 0.0667 | | 33 | 33 | |
| 1.0 ug/L | | 0.333 | | 33 | 33 | |
| 2.0 ug/L | | 0.667 | | 33 | 33 | |
| 5.0 ug/L | | 1.667 | | 33 | 33 | |
| 10.0 ug/L | | 3.333 | | 33 | 33 | |
| ICV | | 0.0835 | 2.5 | 33 | 33 | |
| CCV | | 0.167 | 5.0 | 33 | 33 | |
| ICB/CCB | | | | 33 | 33 | |
| L110012-BLK1 | | | | 33 | 33 | |
| BS1 | | 0.167 | 5.0 | 33 | 33 | |
| BLK2 | < | | | 33 | 33 | L109399 |
| 1105086-09 | < | | | 3.3 * | 33 | |
| 10 | < | | | 3.3 * | 33 | |
| 11 | < | | | 33 | 33 | |
| L110012-MS1 | < | 0.333 | 1.0 | 33 | 33 | |
| 1105086-12 | < | | | 33 | 33 | |
| 13 | < | | | 3.3 * | 33 | |
| 14 | < | | | 33 | 33 | |
| 15 | < | | | 33 | 33 | |
| 16 | < | | | 33 | 33 | |
| 1105087-17 | < | | | 3.3 * | 33 | |
| 18 | < | | | 33 | 33 | |
| 19 | < | | | 33 | 33 | |
| 20 | < | | | 33 | 33 | |
| L110012-MS2 | < | 0.333 | 1.0 | 33 | 33 | |
| 1105087-L821 | < | | | 3.3 * | 33 | |

| Standard: | ID W.E. [illegible] 10/3/11 | Prep Date/Time |
|---|---|---|
| ICAL/MS | BI 11013568 | 10/3/11 1645 |
| ICV/CCV/LCS | I.V. 11012568A | ↓ |

Reviewed By/Date: [illegible] 10/6/11

se book # 9368 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard # _____

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
ater LCS Spiking Concentration: 1.0 µg/ml

* limited volume

ME-HgCVAA-Prep0910

Page #:

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000000018

Lionville Laboratory

# MERCURY PREPARATION

Logbook # 1009

Analyst: [illegible]
Date 10/3/11
Start Time/Temp: [illegible]
End Time/Temp: [illegible]

Instrument ID: AG3.1
Balance # NA
Pipette Calibration (Daily) Y

Prep Batch: L110112
Worksheet: HG100501
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or mL) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| 1105007-22 | < | | | 33 | 33 | |
| 23 | < | | | 33 | 33 | |
| 24 | < | | | 33 | 33 | |

[illegible] 10/3/11

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS | | |
| ICV/CCV/LCS | | |

Reviewed By/Date: [illegible] 10/6/11

se book # 9368 for std traceability information

Soil LCS True Value = See page 018 mg/Kg
Standard # See page 018

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
after LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

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000000619

Lionville Laboratory

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 1006

| | | |
|---|---|---|
| Start Date: 9-30-11<br>Start Time: 13:16<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 10-1-11<br>End Time: 7:00<br>Analyst: RH<br>Method: B(1.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L109399<br>Leachate Page: 3 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-17RE<br>Client ID#: JIHJ08-A1<br>pH After 5 Min: 6.98<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 7.89 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-18RE<br>Client ID#: JIHJ08-B1<br>pH After 5 Min: 6.98<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 7.72 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-19RE<br>Client ID#: JIHJ08-B2<br>pH After 5 Min: 6.98<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 7.58 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-20RE<br>Client ID#: JIHJ08-C1<br>pH After 5 Min: 6.98<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 7.57 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [signature] 10/4/11

SPI-1311.1-A-0310

Page #

Lionville Laboratory

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 1006

| | | |
|---|---|---|
| Start Date: 9-30-11<br>Start Time: 13:16<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 10-1-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L109399<br>Leachate Page: 4 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: 1105007-21 RE<br>Client ID#: JIHJ09-A1<br>pH After 5 Min: 9.08<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 100<br>pH After Extraction: 9.18 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-22 RE<br>Client ID#: JIHJ09-B1<br>pH After 5 Min: 9.08<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 250<br>pH After Extraction: 9.22 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL # 1105007-~~22~~ 23 RE<br>Client ID#: JIHJ09-C1<br>pH After 5 Min: 9.08<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 9.52 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #: 1105007-24 RE<br>Client ID#: JIHJ09-C2<br>pH After 5 Min: 9.08<br>pH After Acid/Heat: N/A<br>Extraction Fluid/pH: 5.03<br>Sample Wt.(g): 100<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: 9.55 | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

Reviewed By/Date [signature] 10/4/11

SPI-1311.1-A-0310

Page #

Lionville Laboratory

# TCLP EXTRACTION RECORD
## (NON-VOLATILES)

LOGBOOK # 1006

| | | |
|---|---|---|
| Start Date: 9-30-11<br>Start Time: 13:16<br>Analyst: RH<br>SOP: SPI-1311.1 | End Date: 10-1-11<br>End Time: 7:00<br>Analyst: RH<br>Method: 1311.1 | Tumbler Speed: 30 RPM<br>Leachate Batch #: L109399<br>Leachate Page: 5 of 5<br>Room Temp. (°C):<br>Start 21 /Finish 21<br>Acceptance Criteria: 23°C ± 2° |

| | |
|---|---|
| LvL #: L109399<br>Client ID#: N/A<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g): —<br>Extract Fluid Vol.(mL): 500<br>pH After Extraction: N/A | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>BLANK<br>Initial Filtrate Added: |
| LvL #:<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>Initial Filtrate Added: |
| LvL #:<br>Client ID#:<br>pH After 5 Min:<br>pH After Acid/Heat:<br>Extraction Fluid/pH:<br>Sample Wt.(g):<br>Extract Fluid Vol.(mL):<br>pH After Extraction: | Initial Filtration Data and Comments:<br>Solids: ____% / NA<br>RH<br>Initial Filtrate Added: |

| Standard | ID | Prep Date | Expir Date |
|---|---|---|---|
| MS | | | |
| | | | |

aem 10/4/11

Reviewed By/Date aem 10/4/11

SPI-1311.1-A-0310

Page #

Lionville Laboratory Use Only: 1105007

# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: W.C. Hanford SAFH RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Alletta Johnson
QC: SW Del: STD TAT: 21 days
Date Rec'd: 5-3-11 Date Due: 5-24-11

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | | | | A-D 2 | | | | | | | | | | | | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | | | | | |
| | Solid | | | | | 4pl | | | | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | | | | |
| | Solid | | | | | 1L | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | | INORG | | | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Special Extract | | | | Metal | CN | | | | | | | | |
| Lionville Laboratory Use Only | | | | | | | | | | | | | | | | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | VOA | BNA | Pest/PCB | Herb 5/6/11 | Special Extract | | Metal + Hg | CN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | J1HJ08-1 | | | * Soil | 4.26.11 | 0905 | | | | | X | | X | | | | | | |
| 02 | 2 | | | | | | | | | | X | | X | | | | | | |
| 03 | 3 | | | | | | | | | | X | | X | | | | | | |
| 04 | 4 | | | | | | | | | | X | | X | | | | | | |
| 05 | J1HJ09-1 | | | | 4.27.11 | 0840 | | | | | X | | X | | | | | | |
| 06 | 2 | | | | | | | | | | X | | X | | | | | | |
| 07 | 3 | | | | | | | | | | X | | X | | | | | | |
| 08 | 4 | | | | | | | | | | X | | X | | | | | | |
| 09 | J1HHX0-1 | | | | 4.27.11 | ~~0835~~ 0845 | 05/13/11 | | | | X | (2) | X | | | | | | |
| 10 | 2 | | | | | | | | | | X | | X | | | | | | |

Special Instructions:
Caution
Potential Beryllium Contamination

Special Instructions:
1. * Matrix (Soil) = Ash.
2. ~~samples in for Total + TCLP RCRA Metals + Hg only (no Hg)~~ 05/16/11
3.
4. Samples -01 thru -08 and -17 thru -24 reanalyzed for Extended List + Hg 9/30/11
5. Extended List Total + TCLP = Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Ag, Tl, U, V, Zn + Hg
6.

See SRC

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | | |
| | | | |

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Lionville Laboratory Use Only: 1105007

# Custody Transfer Record/Lab Work Request

Page 2 of 4

Lionville Laboratory
A Division of Eberline Analytical Corporation

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC Hanford SAF RC-314
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#: Pg 1
Lionville Laboratory Project Manager: Arlette Johnson
QC: Del: TAT:
Date Rec'd: 5-3-11 Date Due:

| Refrigerator # | | A-D | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #/Type Container | Liquid | | | | | 2 | | | | | | | | | | |
| | Solid | | | | | 4pl | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | 1L | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | | | INORG | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | Specific Metals | | 8151 | | Metal | CN | Leachates | | | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only: 8151/6/11 | Metals | | 6010 + Hg Leachate | | TCLP Leachate (see list) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W Water, WW Waste Water, GW Groundwater, WST Waste, WI Wipe, SO Solid, S Soil, SL Sludge, SE Sediment, PC Paint Chips, O Oil, NAL Non-Aqueous Liquid, L Leachate, A Air, T Tissue, F Fish | 11 | JIHHX0-3 | | other | S | 4-27-11 | 0835 | | X | | X | | | | | | |
| | 12 | 4 | | | | | | | X | | X | | | | | | |
| | 13 | JIHHX8-1 | | | S | 4-25-11 | 1415 | | X | | X | | | | | | |
| | 14 | 2 | | | | | | | X | | X | | | | | | |
| | 15 | 3 | | | | | | | X | | X | | | | | | |
| | 16 | 4 | | | | | | | X | | X | | | | | | |
| | 17 | JIHJ08-A1 | | | | 4-26-11 | 0905 | | | | | | X | | | | |
| | 18 | B1 | | | | | | | | | | | X | | | | |
| | 19 | B2 | | | | | | | | | | | X | | | | |
| | 20 | C1 | | | | | | | | | | | X | | | | |

**Special Instructions:**

**Special Instructions:**

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 5-3-11 | 1050 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

000000045

Lionville Laboratory Use Only: 1105007

# Custody Transfer Record/Lab Work Request



Lionville Laboratory
A Division of Eberline Analytical Corporation

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: WC HANFORD RC-214
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#: See Pg 1
Lionville Laboratory Project Manager:
QC: 5 Del: TAT:
Date Rec'd: 5-3-11 Date Due:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; Leachate

Lionville Laboratory Use Only

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | TCLP REF#4 (see list) |
|---|---|---|---|---|---|---|---|
| 21 | JHJ09-A1 | | | OTHER Solid | 4-27-11 | 0840 | X |
| 22 | B1 | | | | | | X |
| 23 | C1 | | | | | | X |
| 24 | C2 | | | | | | X |
| 25 | JHHX0-A1 | | | | | 0835 | X |
| 26 | A2 | | | | | | X |
| 27 | B1 | | | | | | X |
| 28 | C1 | | | | | | X |
| 29 | JHHX8-A1 | | | | 4-25-11 | 1415 | X |
| 30 | B1 | | | | | | X |

Special Instructions:

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

000000046

| Lionville Laboratory Use Only |
|---|
| 1105007 |

# Custody Transfer Record/Lab Work Request



**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

000000047

Client: WC HANFORD RC-214
Est. Final Proj. Sampling Date:
Project#: Pg 1
Project Contact/Phone#: See
Lionville Laboratory Project Manager:
QC: Del: TAT:
Date Rec'd: 5-3-11 Date Due:

| Refrigerator # | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #/Type Container | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | | | | | | | | | | | |
| Volume | Liquid | | | | | | | | | | | | | | | |
| | Solid | | | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | Metal | CN | Leachates | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | | | | | | | | | | TCLP REFAU | | | | | |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | J1HH8-B2 | | | Other Solid | 4-25-11 | 1415 | | | | | | | | | X | | | | |
| 32 | 1 e1 | | | 1 | 1 | 1 | | | | | | | | | X | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
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**Special Instructions:**

**Special Instructions:**

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-29 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER<br>Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C<br>Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | SAF No.: RC-214 | |
| Ice Chest No.: 6W5-826 | Field Logbook No.: EL-1658<br>COA: BESCAS | Method of Shipment: FedEx | |
| Shipped To: EBERLINE SERVICES, LIONVILLE | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: 7970 5197 2441<br>~~See OSPC~~ 2W. 5/2/11 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 - ~~8310~~ 8270 04-22-11 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| J1HJ08 / OTHER / 4/26/11 / 0905 | X | X | X | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|---|
| Relinquished By/Removed From | KB Hulse KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From | SSU #1 | 5/2/11 1100 | L.D. Wall CHPRC L.D. Wall | 5/2/11 1100 |
| Relinquished By/Removed From | L.D. Wall CHPRC L.D. Wall | 5/2/11 1400 | FEDEX | |
| Relinquished By/Removed From | [illegible] | 5-3-11 1050 | [illegible] | 5-3-11 1050 |
| 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, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

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

000000048

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | RC-214-30 | Page 1 of 1 |
|---|---|---|---|---|
| Collector: D Sparks | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C — Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 DEPTH | | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx 7970 5197 2441 | |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~See OOPC~~ DW 5/2/11 | |

000000049

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 - ~~8310~~ 8270 DS 4-28-11 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J1HJ09 | OTHER | 4-27-11 | 0840 | X | X | X | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| D Sparks | 4-28-11/0700 | SSU 2 | 4-28-11/0700 |
| SSU#1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | |
| FedEx | 5-3-11 1050 | | 5-3-11/1050 |
| 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, Uranium, 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

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-21 | Page 1 of 1 |
|---|---|---|---|
| Collector: KB Hulse D Sparling | Company Contact: JOAN KESSNER; Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH | Price Code: 9C; Data Turnaround: 15 Days |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | SAF No.: RC-214 | |
| Ice Chest No.: GWS-826 | Field Logbook No.: EL-1658; COA: BESCAS | Method of Shipment: FedEx | |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: 2585 | Bill of Lading/Air Bill No.: ~~See OSPC~~ 2W. 5/2/11 7970 5197 2441 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 2 | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | 250mL 125 | | | | | | | |
| SAMPLE ANALYSIS | See Item (1) in Special Instructions. | PAHs ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | J1HHW9 | OTHER. | 4-26-11 | 0955 | X | | | | | | | | | |
| 17 | J1HHX0 | OTHER | 4-27-11 | 0835 | X | X | X | | | | | | | |
| 18 | J1HHX1 | OTHER | 4-27-11 | 1230 | X | | | | | | | | | |
| 19 | J1HHX2 | OTHER | | | | | | | | | | | | |
| 20 | J1HHX3 | OTHER | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|---|
| Relinquished By/Removed From | KB Hulse | 4-26-11 1300 | SSU-1 | 4-26-11 1300 |
| Relinquished By/Removed From | ~~J Sparling~~ | ~~4-27-11 / 0700~~ | ~~SSU-1~~ | |
| Relinquished By/Removed From | SSU-1 | 4/27/11 / 0700 | L.D. Wall CHPRC | 4-27-11/0700 |
| Relinquished By/Removed From | L.D. Wall CHPRC | 4/28/11/0700 | SSU-1 | 4-28-11/0700 |
| Relinquished By/Removed From | SSU#1 | 5/2/11 1100 | L.D. Wall CHPRC | 5/2/11 1100 |
| Relinquished By/Removed From | L.D. Wall CHPRC | 5/2/11 1400 | FEDEX | 5-3-11/1050 |
| LABORATORY SECTION | Received By: FedEx 5-3-11/1050 | Title | | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | | Disposed By | 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, Uranium, 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

WCH-EE-011

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-214-22 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: KB Hulse | Company Contact: JOAN KESSNER | Telephone No.: 375-4688 | Project Coordinator: KESSNER, JH |
| Price Code: 9C | Data Turnaround: 15 Days | | |
| Project Designation: Characterization of Hanford Site Coal Ash Components - Oth | Sampling Location: 126-B-1 SURFACE | | SAF No.: RC-214 |
| Ice Chest No.: GW5826 | Field Logbook No.: EL-1658 | COA: BESCAS | Method of Shipment: FedEx |
| Shipped To: EBERLINE SERVICES / LIONVILLE | Offsite Property No.: 2585 | | Bill of Lading/Air Bill No.: ~~Sec 03PC~~ 7970 5197 2441 |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Potential Beryllium contamination*

Special Handling and/or Storage

*Tie to RAD Screen J1HJ06*

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | None | Cool 4C | None | None | | | | | | | | |
| Type of Container | G/P | aG | P | G/P | | | | | | | | |
| No. of Container(s) | 1 | 1 | 2 | 1 | | | | | | | | |
| Volume | 250mL | 250mL | 1000mL | 0mL | | | | | | | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | PAHs - ~~8310~~ 8270 | SPECIAL EXTRACTION - ASTM D3987 | Total Uranium | | | | | | | | |

| | Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | J1HHX4 | OTHER | 4/25/11 | 1345 | X | | | | | | | | | |
| 22 | J1HHX5 | OTHER | 4/26/11 | 0930 | X | | | | | | | | | |
| 23 | J1HHX6 | OTHER | 4/26/11 | 0935 | X | | | | | | | | | |
| 24 | J1HHX7 | OTHER | 4/26/11 | 0920 | X | | | | | | | | | |
| 25 | J1HHX8 | OTHER | 4/25/11 | 1415 | X | X | X | | | | | | | |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| Relinquished By/Removed From: KB Hulse, Date/Time: 4-26-11 1300 | Received By/Stored In: SSU- 1, Date/Time: 4-26-11 1300 | |
| Relinquished By/Removed From: SSU #1, Date/Time: 5/2/11 1100 | Received By/Stored In: L.D. Wall CHPRC, Date/Time: 5/2/11 1100 | |
| Relinquished By/Removed From: L.D. Wall CHPRC, Date/Time: 5/2/11 1400 | Received By/Stored In: FEDEX, Date/Time: | |
| Relinquished By/Removed From: FedEx, Date/Time: 5-3-11 1050 | Received By/Stored In: DSmith, Date/Time: 5-3-11 1050 | |
| 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, Uranium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

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

000000051

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hardaro
Project/SAF/SOW/Release #: RC-214

Date: 5-3-11

LvL Batch #: 1105007

Sample Custodian: D. Spivey

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier FedEx | | Airbill # 7970 5197 2441 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 3.4 | °C | Cooler # GWS-826 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvL ) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☐ Yes | ☐ No | ☑ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted _____ Date _____