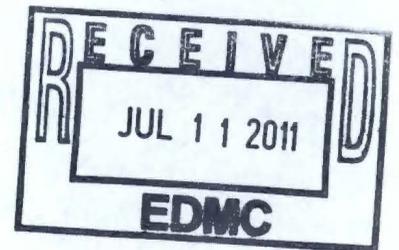


SAF-RC-194
Soil/Sediment Sampling – Integrated
Remedial Investigation/Feasibility Study,
100-F Area Boreholes
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

COMMENTS:



SDG K3159

SAF-RC-194

Rad only

Chem only

Rad & Chem

Complete

Partial

ADDITIONAL TOTAL STRONTIUM DATA ATTACHED

Sample Location: C7970 (116-F-14); I-001, I-006



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1 June 2011

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



Subject: Analytical Data Package

Dear Ms. Kessner:

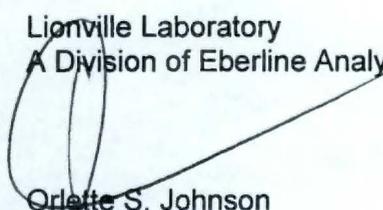
Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	1102123
SDG #	K3159 SPEC EXT
SAF #	RC-194
Date Received	02/15/11
# Samples	2
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	X

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

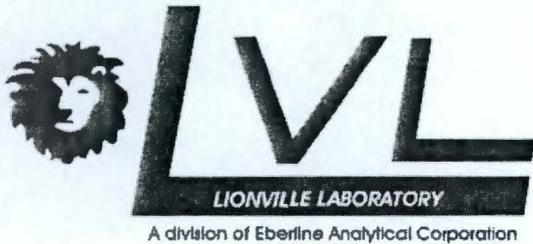


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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-194 Project Number: K3159 Project Manager: Joan Kessner	Reported: 05/31/2011 11:54
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Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B28NP0-1	1102123-01	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-2	1102123-02	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-3	1102123-03	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-4	1102123-04	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP5-1	1102123-05	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-2	1102123-06	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-3	1102123-07	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-4	1102123-08	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP0-A1	1102123-09	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-A2	1102123-10	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-B1	1102123-11	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-C1	1102123-12	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP5-A1	1102123-13	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-B1	1102123-14	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-B2	1102123-15	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-C1	1102123-16	Leachate	02/11/2011 08:25	02/15/2011 14:34



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Case Narrative

Client: WC-HANFORD RC-194
LVL#: 1102123
SDG/SAF#: K3159/RC-194

W.O.#: 60049-001-001-0001-00
Date Received: 02-15-11

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.

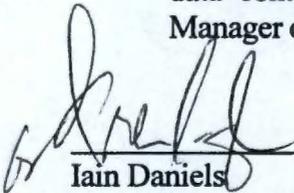
All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise.

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.

The TCLP leachate samples B28NP0-A1, B28NP0-A2, and B28NP5-A1 were prepared with 5-fold dilutions due to insufficient sample volume.

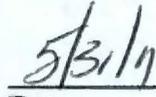
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), MB value less than 5% of the RCRA limit, samples were greater than 20X MB value}.
8. All ICP Interference Check Standards were within control limits.

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer. All laboratory control samples (LCS) were within the 80-120% control limits.
10. All soil matrix spike (MS) recoveries were within the 75-125% control limits.
11. The TCLP leachate matrix spike analyses were performed on WC-Hanford sample J1CN48-B1 within the same digestion batch. Please refer to this package for the associated QC forms.
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

alm/02-123specext



Date



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WC-Hanford, Inc.
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Richland WA, 99354

Project: RC-194
Project Number: K3159
Project Manager: Joan Kessner

Reported:
05/31/2011 11:54

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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Reported:
 05/31/2011 11:54

B28NP0-1
1102123-01 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	2.28 B	2.73	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	64.2	0.455	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.273 U	0.273	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	15.7	0.273	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	3.63	2.73	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.55 U	4.55	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.455 U	0.455	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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Reported:
 05/31/2011 11:54

B28NP0-2
1102123-02 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	2.07 B	2.99	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	61.8	0.498	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.299 U	0.299	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	14.4	0.299	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	3.32	2.99	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.98 U	4.98	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.498 U	0.498	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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Reported:
 05/31/2011 11:54

B28NP0-3
1102123-03 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	2.08 B	2.78	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	63.3	0.463	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.278 U	0.278	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	12.0	0.278	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	3.34	2.78	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.63 U	4.63	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.463 U	0.463	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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Reported:
 05/31/2011 11:54

B28NP0-4
1102123-04 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	2.34 B	2.83	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	61.6	0.471	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.283 U	0.283	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	14.8	0.283	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	3.12	2.83	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.71 U	4.71	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.471 U	0.471	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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B28NP5-1
1102123-05 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	1.70 B	2.46	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	61.9	0.411	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.246 U	0.246	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	17.8	0.246	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	2.22 B	2.46	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.11 U	4.11	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.411 U	0.411	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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B28NP5-2
1102123-06 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	1.69 B	2.54	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	59.0	0.424	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.254 U	0.254	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	20.2	0.254	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	1.98 B	2.54	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.24 U	4.24	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.424 U	0.424	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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B28NP5-3
1102123-07 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	1.78 B	2.63	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	61.8	0.439	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.263 U	0.263	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	17.8	0.263	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	2.34 B	2.63	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.39 U	4.39	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.439 U	0.439	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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Reported:
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B28NP5-4
1102123-08 (Soil)

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

Metals by SW846 6000/7000 series

Arsenic	2.36 B	2.93	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Barium	65.0	0.488	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Cadmium	0.293 U	0.293	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Chromium	19.0	0.293	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Lead	2.34 B	2.93	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Selenium	4.88 U	4.88	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B
Silver	0.488 U	0.488	mg/kg dry	1	L105087	05/05/2011	05/27/2011	6010B



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Reported:
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B28NP0-A1
1102123-09 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0250 U	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.250 U	0.250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.0250 U	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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Reported:
 05/31/2011 11:54

B28NP0-A2
1102123-10 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0101 B	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.250 U	0.250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.0250 U	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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B28NP0-B1
1102123-11 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.00649	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.0500 U	0.0500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.00500 U	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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Reported:
 05/31/2011 11:54

B28NP0-C1
1102123-12 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.00520	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.0500 U	0.0500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.00500 U	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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

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

Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/31/2011 11:54

B28NP5-A1
1102123-13 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0305	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.0150 U	0.0150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.150 U	0.150	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.250 U	0.250	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.0250 U	0.0250	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/31/2011 11:54

B28NP5-B1
1102123-14 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0300	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.0500 U	0.0500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.00500 U	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/31/2011 11:54

B28NP5-B2
1102123-15 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0289	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.0500 U	0.0500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.00500 U	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-194 Project Number: K3159 Project Manager: Joan Kessner	Reported: 05/31/2011 11:54
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B28NP5-C1
1102123-16 (Leachate)

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

TCLP Metals by SW846 1311 6000/7000 series

Arsenic	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Barium	0.0182	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Cadmium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Chromium	0.00300 U	0.00300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Lead	0.0300 U	0.0300	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Selenium	0.0500 U	0.0500	mg/L	1	L105291	05/24/2011	05/27/2011	6010
Silver	0.00500 U	0.00500	mg/L	1	L105291	05/24/2011	05/27/2011	6010



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Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/31/2011 11:54

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 L105087 - SW 3050B									
Blank (L105087-BLK1)					Prepared: 05/05/2011 Analyzed: 05/27/2011				
Arsenic	2.73 U	2.73	mg/kg wet						
Barium	0.183 B	0.455	mg/kg wet						
Cadmium	0.273 U	0.273	mg/kg wet						
Chromium	0.273 U	0.273	mg/kg wet						
Lead	2.73 U	2.73	mg/kg wet						
Selenium	4.55 U	4.55	mg/kg wet						
Silver	0.455 U	0.455	mg/kg wet						
Matrix Spike (L105087-MS1)					Source: 1102123-01 Prepared: 05/05/2011 Analyzed: 05/27/2011				
Arsenic	173	2.88	mg/kg dry	191.82	2.28	89	75-125		20
Barium	234	0.480	mg/kg dry	191.82	64.2	89	75-125		20
Cadmium	4.23	0.288	mg/kg dry	4.7955	0.273 U	88	75-125		20
Chromium	31.4	0.288	mg/kg dry	19.182	15.7	82	75-125		20
Lead	42.8	2.88	mg/kg dry	47.955	3.63	82	75-125		20
Selenium	160	4.80	mg/kg dry	191.82	4.55 U	84	75-125		20
Silver	4.05	0.480	mg/kg dry	4.7955	0.455 U	84	75-125		20
Reference (L105087-SRM1)					Prepared: 05/05/2011 Analyzed: 05/27/2011				
Arsenic	117	8.82	mg/kg wet	114.00		102	82.8-117.54		
Barium	315	1.47	mg/kg wet	307.00		103	79.8-120.2		
Cadmium	230	0.882	mg/kg wet	225.00		102	83.6-116.4		
Chromium	82.4	0.882	mg/kg wet	77.200		107	73.3-126.4		
Lead	188	8.82	mg/kg wet	190.00		99	81.6-118.4		
Selenium	184	14.7	mg/kg wet	187.00		98	75.9-124.6		
Silver	85.2	1.47	mg/kg wet	83.500		102	82.7-117.1		



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Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/31/2011 11:54

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
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Batch L105291 - SW 3005A

Blank (L105291-BLK1)			Prepared: 05/24/2011 Analyzed: 05/27/2011						
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						

Blank (L105291-BLK2)			Prepared: 05/24/2011 Analyzed: 05/27/2011						
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						

LCS (L105291-BS1)			Prepared: 05/24/2011 Analyzed: 05/27/2011						
Arsenic	10.1	0.0300	mg/L	10.000		101	80-120		20
Barium	5.04	0.00500	mg/L	5.0000		101	80-120		20
Cadmium	0.245	0.00300	mg/L	0.25000		97.9	80-120		20
Chromium	0.489	0.00300	mg/L	0.50000		97.7	80-120		20
Lead	2.48	0.0300	mg/L	2.5000		99.0	80-120		20
Selenium	10.2	0.0500	mg/L	10.000		102	80-120		20
Silver	0.497	0.00500	mg/L	0.50000		99.4	80-120		20

SAMPLE DIGESTION RECORD

Digestion Batch #: L1050 87
 Date/Time Initiated: 5/15/11 20:3
 Date/Time Completed: 5/15/11 23:00
 Analyst: BLW
 Matrix (circle): Soil Water Other
 Method (circle one): 3005A 3010A 3050 200.7 (1994)

Digested / Undigested (circle one)
 Balance #: 8-14
 Balance Cal Verification: NA
 Temp: 95°C
 BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/TC	Texture	Color / Appearance	Artifact	Turb
1102123-1		0.58	50		TD	Fine	Black		
-1-MS1	0.5	0.55	50						
-2		0.53	50						
-3		0.57	50						
-4		0.56	50						
-5		0.63	50			Fine	gray		
-6		0.61	50						
-7		0.59	50						
-8		0.53	50						
1102134-1		0.58	50			Fine	brown		
-2		0.53	50						
-3		0.57	50						
-4		0.56	50						
-5		0.54	50			Fine	brown		
-6		0.63	50						
-7		0.59	50						
-8		0.50	50						
-9		0.57	50			Fine	Brown		
-10		0.64	50						
-11		0.56	50						
-12		0.56	50						
BLK 1		0.55	50						
SRM 1		0.51	50						
BLW 5/15/11									

Spiking IDs / Expiration Date:

MS#: 1001843

LCS#: 1000:03

Reagent IDs:

HNO₃ K09041

HCl K12046

H₂O₂ K03011

1:1 HNO₃ 637-071-05

1:1 HCl _____

File ID#: _____

Data Review By/ Date:

BLW 5/19/11

SAMPLE DIGESTION RECORD

Digestion Batch #: L105291

Date/Time Initiated: 5/24/11 11:55

Date/Time Completed: 5/25/11 12:10

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: 95

BLOCK 1 2 (circle one)

C/C = clear / c/dark

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH	Type: To/Sol/TC	Texture	Color / Appearance	Artifact	Turb
1101210-09		10	50		TO	N/A	C/C	N/A	N/A
10		50	50				C/C		
11		50	50				C/C		
12		50	50				C/C		
13		10	50				C/C		
14		50	50				C/C		
15		50	50				C/C		
16		50	50				C/C		
1102123-09		10	50				C/C		
10		10	50				C/C		
11		50	50				C/C		
12		50	50				C/C		
13		10	50				C/C		
14		50	50				C/C		
15		50	50				C/C		
16		50	50				C/C		
1102161-05		10	50				C/C		
06		50	50				C/C		
07		50	50				C/C		
08		50	50				C/C		
12/1		50	50				C/C		
12/1	0.5	50	50				C/C		
12/1		50	50				C/C		
L105291-751	0.5	50	50				C/C		

JS 5/25/11

Spiking IDs / Expiration Date:

MS#: 1100338

1100217

LCS#: 1100290

Reagent IDs:

HNO₃ 1109041

HCl 1114054

H₂O₂

1:1 HNO₃

1:1 HCl

File ID#:

Data Review By/Date:

Apm 5/26/11

* Associated with Sample 1101210-10

+ Associated with L105291

TCLP EXTRACTION RECORD
(NON-VOLATILES)

Start Date: <u>5-17-11</u>	End Date: <u>5-18-11</u>	Tumbler Speed: <u>30 RPM</u>
Start Time: <u>13:00</u>	End Time: <u>7:00</u>	Leachate Batch #: <u>405207</u>
Analyst: <u>RH</u>	Analyst: <u>RH</u>	Leachate Page: <u>3</u> of <u>6</u>
SOP: <u>SPI-1311.1</u>	Method: <u>1311.1</u>	Room Temp. (°C): Start <u>21</u> / Finish <u>21</u>
Acceptance Criteria: 23°C + 2°		

LvL #: <u>1102123-09</u>	Initial Filtration Data and Comments: Solids: _____% / NA
Client ID#: <u>B28NPO-A1</u>	
pH After 5 Min: <u>9.35</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>100</u>	
pH After Extraction: <u>8.48</u>	
Initial Filtrate Added: _____	

LvL #: <u>1102123-10</u>	Initial Filtration Data and Comments: Solids: _____% / NA
Client ID#: <u>B28NPO-A2</u>	
pH After 5 Min: <u>9.35</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>100</u>	
pH After Extraction: <u>8.32</u>	
Initial Filtrate Added: _____	

LvL #: <u>1102123-11</u>	Initial Filtration Data and Comments: Solids: _____% / NA
Client ID#: <u>B28NPO-B1</u>	
pH After 5 Min: <u>9.35</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>250</u>	
pH After Extraction: <u>8.31</u>	
Initial Filtrate Added: _____	

LvL #: <u>1102123-12</u>	Initial Filtration Data and Comments: Solids: _____% / NA
Client ID#: <u>B28NPO-C1</u>	
pH After 5 Min: <u>9.35</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>500</u>	
pH After Extraction: <u>8.28</u>	
Initial Filtrate Added: _____	

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date RH/5/11 Page #

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK.# 969

Start Date: <u>5-17-11</u>	End Date: <u>5-18-11</u>	Tumbler Speed: <u>30 RPM</u>
Start Time: <u>13:00</u>	End Time: <u>7:00</u>	Leachate Batch #: <u>L105207</u>
Analyst: <u>RM</u>	Analyst: <u>RH</u>	Leachate Page: <u>4</u> of <u>6</u>
SOP: <u>SPI-1311.1</u>	Method: <u>1311.1</u>	Room Temp. (°C): Start <u>21</u> / Finish <u>21</u>
Acceptance Criteria: 23°C ± 2°		

Lvl #: <u>1102123-13</u>	Initial Filtration Data and Comments:
Client ID#: <u>B28NPS-A1</u>	Solids: _____ % / NA
pH After 5 Min: <u>8.86</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>100</u>	
pH After Extraction: <u>7.90</u>	Initial Filtrate Added: _____

Lvl #: <u>1102123-14</u>	Initial Filtration Data and Comments:
Client ID#: <u>B28NPS-B1</u>	Solids: _____ % / NA
pH After 5 Min: <u>8.86</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>250</u>	
pH After Extraction: <u>7.96</u>	Initial Filtrate Added: _____

Lvl #: <u>1102123-15</u>	Initial Filtration Data and Comments:
Client ID#: <u>B28NPS-B2</u>	Solids: _____ % / NA
pH After 5 Min: <u>8.86</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>250</u>	
pH After Extraction: <u>7.90</u>	Initial Filtrate Added: _____

Lvl #: <u>1102123-16</u>	Initial Filtration Data and Comments:
Client ID#: <u>B28NPS-C1</u>	Solids: _____ % / NA
pH After 5 Min: <u>8.86</u>	
pH After Acid/Heat: <u>N/A</u>	
Extraction Fluid/pH: <u>5.05</u>	
Sample Wt.(g): <u>100</u>	
Extract Fluid Vol.(mL): <u>500</u>	
pH After Extraction: <u>8.01</u>	Initial Filtrate Added: _____

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date RH 5/18/11

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 969

Start Date: <u>5-17-11</u> Start Time: <u>3:00</u> Analyst: <u>RA</u> SOP: <u>SPI-1311.1</u>	End Date: <u>5-18-11</u> End Time: <u>7:00</u> Analyst: <u>RA</u> Method: <u>BLR</u>	Tumbler Speed: <u>30 RPM</u> Leachate Batch #: <u>L105207</u> Leachate Page: <u>6 of 6</u> Room Temp. (°C): Start <u>21</u> / Finish <u>21</u> Acceptance Criteria: 23°C ± 2°
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Lvl #: <u>L105207</u> Client ID#: <u>N/A</u> pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): <u>500</u> pH After Extraction: <u>N/A</u>	Initial Filtration Data and Comments: Solids: _____ % / NA <p style="text-align: center; font-size: 2em;"><u>BLANK</u></p> Initial Filtrate Added: _____
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 Lvl #: _____ Client ID#: _____ pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): _____ pH After Extraction: _____ 	 Initial Filtration Data and Comments: Solids: _____ % / NA Initial Filtrate Added: _____
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 Lvl #: _____ Client ID#: _____ pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): _____ pH After Extraction: _____ 	 Initial Filtration Data and Comments: Solids: _____ % / NA Initial Filtrate Added: _____
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 Lvl #: _____ Client ID#: _____ pH After 5 Min: _____ pH After Acid/Heat: _____ Extraction Fluid/pH: _____ Sample Wt.(g): _____ Extract Fluid Vol.(mL): _____ pH After Extraction: _____ 	 Initial Filtration Data and Comments: Solids: _____ % / NA Initial Filtrate Added: _____
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Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date RA 5/17/11 Page #

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-194-002	PAGE 1 OF 1
COLLECTOR <i>Turner, Crow, Wallace</i>	COMPANY CONTACT KESSNER, JH	TELEPHONE NO. 375-4688	PROJECT COORDINATOR KESSNER, JH		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7970 (116-F-14); I-001	PROJECT DESIGNATION Soil/Sediment Sampling - Integrated Remedial Investigation/Feasibility Stud		SAF NO. RC-194		AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. <i>GWS-500</i>	FIELD LOGBOOK NO. <i>HMF-N-585-14 pg 31</i>	ACTUAL SAMPLE DEPTH <i>15-42'-17-92'</i>	COA 302513ES10		METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Lionville Laboratory Incorporated	OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR 794422738880			

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	None	
		HOLDING TIME	180 Days	
		TYPE OF CONTAINER	P	
		NO. OF CONTAINER(S)	1	
		VOLUME	500mL	
SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B28NV9		SAMPLE ANALYSIS	Special Extraction - D3987 (100 Area RIFS);	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B28NP0	SOIL	2-9-11	1245	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>A. Turner</i>	<i>2-9-11 1550</i>	<i>M0413 SS4 R2</i>	<i>2-9-11 1550</i>		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>SSU-R2</i>	<i>2-14-11 1000</i>	<i>cm Dugh</i>	<i>2-14-11 1000</i>		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>cm Dugh</i>	<i>2-14-11 1400</i>	<i>FEDLX</i>			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
<i>Fed Ex</i>	<i>2-15-11 1434</i>	<i>VICTOR HERNANDEZ</i>	<i>2-15-11 1434</i>		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-194-033	PAGE 1 OF 1
COLLECTOR <i>Turner, GWS Chamberlain</i>		COMPANY CONTACT KESSNER, JH	TELEPHONE NO. 375-4688	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7970 (116-F-14); I-006		PROJECT DESIGNATION Soil/Sediment Sampling - Integrated Remedial Investigation/Feasibility Stud		SAF NO. RC-194	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. <i>GWS-500</i>		FIELD LOGBOOK NO. <i>#NF-1-585-14 1633</i>	ACTUAL SAMPLE DEPTH <i>37.5-40'</i>	COA 302513ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Lionville Laboratory Incorporated		OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR 794422738880		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	None
		HOLDING TIME	180 Days
		TYPE OF CONTAINER	P
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B28NW1	SAMPLE ANALYSIS	Special Extraction - D3987 (100 Area RIFS);
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B28NP5	SOIL	2-11-11	0825 X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM <i>A. Turner</i>	DATE/TIME <i>2-11-11 1420</i>	RECEIVED BY/STORED IN <i>MOY13SSU R2</i>
RELINQUISHED BY/REMOVED FROM <i>SSU-R2</i>	DATE/TIME <i>2-14-11 0900</i>	RECEIVED BY/STORED IN <i>cm Agular cm Agl</i>
RELINQUISHED BY/REMOVED FROM <i>cm Agular cm Agl</i>	DATE/TIME <i>2-14-11 1400</i>	RECEIVED BY/STORED IN <i>FEDELY</i>
RELINQUISHED BY/REMOVED FROM <i>F. De</i>	DATE/TIME <i>2-15-11 1434</i>	RECEIVED BY/STORED IN <i>VICTOR HERNANDEZ</i>
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

Lionville Laboratory
 SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
 Project/SAF/SOW/Release #: RC-194

Date: 2/15/11

LvL Batch #: 1102 123

Sample Custodian: Vito Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|--|---|---|
| 1. Samples Hand Delivered <u>or Shipped?</u> | Carrier <u>FEDEX</u> | Airbill # <u>794422738880</u> |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> Comments: |
| 4. All expected paperwork received (coc & other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. Samples received cooled or ambient? | Temp <u>1-9</u> °C | Cooler # <u>GWS-500</u> |
| How was the temperature taken? | <input checked="" type="checkbox"/> X | <input type="checkbox"/> Temp. Blank <input type="checkbox"/> Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> No Seals |
| 7. COC (Client & LvL) signed & dated? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9. All samples on COC received? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| All samples received on COC? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 10. All sample label information matches COC? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No <input type="checkbox"/> N/A |
| 13. VOA, TOC, TOX free of headspace? | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input checked="" type="checkbox"/> 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.) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 16. Project Manager contacted concerning any discrepancies? | <input type="checkbox"/> Yes | <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A |
| Person Contacted _____ | Date _____ | |



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

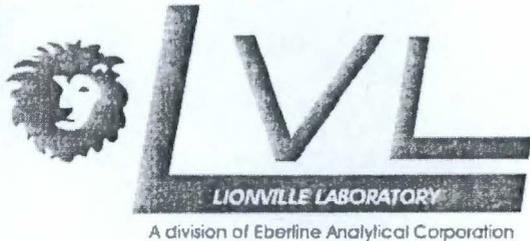
WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-194
Project Number: K3159
Project Manager: Joan Kessner

Reported:
05/26/2011 16:57

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B28NP0-1	1102123-01	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-2	1102123-02	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-3	1102123-03	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP0-4	1102123-04	Soil	02/09/2011 12:45	02/15/2011 14:34
B28NP5-1	1102123-05	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-2	1102123-06	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-3	1102123-07	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP5-4	1102123-08	Soil	02/11/2011 08:25	02/15/2011 14:34
B28NP0-A1	1102123-09	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-A2	1102123-10	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-B1	1102123-11	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP0-C1	1102123-12	Leachate	02/09/2011 12:45	02/15/2011 14:34
B28NP5-A1	1102123-13	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-B1	1102123-14	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-B2	1102123-15	Leachate	02/11/2011 08:25	02/15/2011 14:34
B28NP5-C1	1102123-16	Leachate	02/11/2011 08:25	02/15/2011 14:34



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

Client: WC-HANFORD RC-194 K3159
LVL#: 1102123

Date Received: 02-15-11

INORGANIC NARRATIVE

1. This narrative covers the analyses of 8 soil and 8 leachate samples.
2. The samples were prepared using the client prescribed leaching procedure and analyzed in accordance with the methods indicated on the data summary report.

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

3. Sample holding times as required by the method and/or contract were met for total Hexavalent Chromium (Cr^{6+}) and the leachate samples analysis were performed within 24 hours of the completion of the filtering step of the preparation procedure.
4. The method blanks were within the method criteria.
5. The Laboratory Control Samples (LCS) were within the 90-110% and 80-120% control limits.
6. The matrix spike recovery for sample B28NP5-C1 was within the 75-125% control limits.
7. Results for soil samples are reported on a dry weight basis.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory
njpl02-123

5/31/11
Date



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

Project: RC-194
Project Number: K3159
Project Manager: Joan Kessner

Reported:
05/26/2011 16:57

Notes and Definitions

- U Analyte included in the analysis, but not detected
- D Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
- 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
- LOD Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
- LOQ Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably



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Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/26/2011 16:57

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
B28NP0-1 (1102123-01) Soil									
%Solids	94.8	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP0-2 (1102123-02) Soil									
%Solids	94.8	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP0-3 (1102123-03) Soil									
%Solids	94.8	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP0-4 (1102123-04) Soil									
%Solids	94.8	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.21 U	0.21	0.53	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP5-1 (1102123-05) Soil									
%Solids	96.6	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.24	0.21	0.52	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP5-2 (1102123-06) Soil									
%Solids	96.6	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.22	0.21	0.52	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP5-3 (1102123-07) Soil									
%Solids	96.6	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.25	0.21	0.52	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A



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 2620 Fermi Avenue
 Richland WA, 99354

Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/26/2011 16:57

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
B28NP5-4 (1102123-08) Soil									
%Solids	96.6	0.1	0.1	% by Weight	1	L102265	02/17/2011	02/17/2011	SM2540G
Hexavalent Chromium	0.23	0.21	0.52	mg/kg dry	1	L103085	03/07/2011	03/07/2011	ISW846 7196A
B28NP0-A1 (1102123-09) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP0-A2 (1102123-10) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP0-B1 (1102123-11) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP0-C1 (1102123-12) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP5-A1 (1102123-13) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP5-B1 (1102123-14) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP5-B2 (1102123-15) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A
B28NP5-C1 (1102123-16) Leachate									
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L	1	L105258	05/19/2011	05/19/2011	ISW846 7196A



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

Project: RC-194
 Project Number: K3159
 Project Manager: Joan Kessner

Reported:
 05/26/2011 16:57

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L103085 - Default Prep GenChem										
Blank (L103085-BLK1) Prepared & Analyzed: 03/07/2011										
Hexavalent Chromium	0.20 U	0.20	0.50	mg/kg wet						
LCS (L103085-BS1) Prepared & Analyzed: 03/07/2011										
Hexavalent Chromium	3.69	0.20	0.50	mg/kg wet	4.0000		92	80-120		
LCS (L103085-BS2) Prepared & Analyzed: 03/07/2011										
Hexavalent Chromium	1110 D	20.0	50.0	mg/kg wet	1049.7		106	80-120		
Batch L105258 - Default Prep GenChem										
Blank (L105258-BLK1) Prepared & Analyzed: 05/19/2011										
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L						
Blank (L105258-BLK2) Prepared & Analyzed: 05/19/2011										
Hexavalent Chromium	0.01 U	0.01	0.02	mg/L						
LCS (L105258-BS1) Prepared & Analyzed: 05/19/2011										
Hexavalent Chromium	0.99	0.01	0.02	mg/L	1.0000		99	90-110		
Matrix Spike (L105258-MS1) Source: 1102123-16 Prepared & Analyzed: 05/19/2011										
Hexavalent Chromium	1.02	0.01	0.02	mg/L	1.0000	0.01 U	102	75-125		

CH2MHIII Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-194-002	PAGE 1 OF 1
COLLECTOR <i>Turner, Crow, Wallace</i>	COMPANY CONTACT KESSNER, JH	TELEPHONE NO. 375-4688	PROJECT COORDINATOR KESSNER, JH		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7970 (116-F-14); I-001	PROJECT DESIGNATION Soil/Sediment Sampling - Integrated Remedial Investigation/Feasibility Stud		SAF NO. RC-194	AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO. <i>6WS-500</i>	FIELD LOGBOOK NO. <i>HMF-N-585-14 PG 31</i>	ACTUAL SAMPLE DEPTH <i>15-42'-17.92'</i>	COA 302513ES10	METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO Lionville Laboratory Incorporated	OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR 794422738880			

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	None
		HOLDING TIME	180 Days
		TYPE OF CONTAINER	P
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B28NV9		SAMPLE ANALYSIS	Special Extraction - D3987 (100 Area RIFS);
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B28NP0	SOIL	2-9-11	1245 X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM <i>A. Turner ATZ</i>	DATE/TIME <i>2-9-11 1550</i>	RECEIVED BY/STORED IN <i>MOYIB SS4 R2</i>
RELINQUISHED BY/REMOVED FROM <i>SS4-R2</i>	DATE/TIME <i>2-14-11 1000</i>	RECEIVED BY/STORED IN <i>cm Aguilar cm Agui 2-14-11 1000</i>
RELINQUISHED BY/REMOVED FROM <i>cm Aguilar cm Agui</i>	DATE/TIME <i>2-14-11 1400</i>	RECEIVED BY/STORED IN <i>FED EX</i>
RELINQUISHED BY/REMOVED FROM <i>Fed Ex</i>	DATE/TIME <i>2-15-11 1434</i>	RECEIVED BY/STORED IN <i>VICTOR HERNANDEZ 2-15-11 1434</i>
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

 ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

COLLECTOR Turner, Clow, Chamberlain		COMPANY CONTACT KESSNER, JH	TELEPHONE NO. 375-4688	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7970 (116-F-14); I-006		PROJECT DESIGNATION Soil/Sediment Sampling - Integrated Remedial Investigation/Feasibility Stud		SAF NO. RC-194	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GWS-500		FIELD LOGBOOK NO. HNF-585-14 1633	ACTUAL SAMPLE DEPTH 37.5-40'	COA 302513ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Lionville Laboratory Incorporated		OFFSITE PROPERTY NO. SEE PTR		BILL OF LADING/AIR BILL NO. SEE PTR 794422738880		

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	None	
		HOLDING TIME	180 Days	
		TYPE OF CONTAINER	P	
		NO. OF CONTAINER(S)	1	
		VOLUME	500mL	
		SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B28NW1	SAMPLE ANALYSIS Special Extraction - D3987 (100 Area RIFS);	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B28NP5	SOIL	2-11-11	0825	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
A. Turner	2-11-11 1420	MOY13 SSK R2	2-11-11 1420	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
SSU-R2	2-14-11 0900	cmBawler cmBgl	2-14-11 0900	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
cmBawler cmBgl	2-14-11 1400	FEDLY		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
FWP	2-15-11 1434	VICTOR HERNANDEZ	2-15-11 1434	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

Lionville Laboratory
 SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
 Project/SAF/SOW/Release #: RC-194

Date: 2/15/11

LvL Batch #: 1102 123

Sample Custodian: [Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|--|--|---|
| 1. Samples Hand Delivered <u>or Shipped?</u> | Carrier <u>File E</u> | Airbill # <u>794422738880</u> |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Comments: |
| 4. All expected paperwork received (coc & other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received cooled or ambient? | Temp <u>1-9</u> °C | Cooler # <u>GWS-500</u> |
| How was the temperature taken? | <input checked="" type="checkbox"/> X <input type="checkbox"/> Temp. Blank | <input type="checkbox"/> Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 6. Custody seals on sample containers intact signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. COC (Client & LvL) signed & dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on COC received?
All samples received on COC? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches COC? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times?
Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 13. VOA, TOC, TOX free of headspace? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> 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.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning any discrepancies?
Person Contacted _____ | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A
Date _____ |



EBERLINE SERVICES

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June 20, 2011

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



Reference: **P.O. #S00W235A00**
Eberline Analytical S1-06-025-7499, SDG K3159

Dear Ms. Kessner:

Enclosed is the data report for four leachate (water) samples designated under SAF No. RC-194, received at Eberline Analytical on June 1, 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/ljb

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3159 was composed of four leachate (water) samples designated under SAF No. RC-194 with a Project Designation of:

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 June 20, 2011.

2.0 ANALYSIS NOTES

2.1 Strontium-90 Analysis

The individual sample MDA's were greater than the RDL due to very small volumes available for analysis, also by agreement with WCH, no duplicate analyses were performed. 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. Joseph Verville
Client Services Manager

6/20/11

Date

EBRLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3159

SDG 7499
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG_K3159

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

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VB

Prepared by

Reviewed by

Joseph Verville

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 06/17/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3159

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.

REPORT GUIDES

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SUMMARY DATA SECTION

Page 1

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/17/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3159

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.

REPORT GUIDES

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SUMMARY DATA SECTION

Page 2

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Protocol Hanford1
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Form DVD-RG
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
Contact N. Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3159

LAB							CHAIN OF	
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED	
S106025-01	B28NP5-A1		WATER		RC-194	RC-194, 1102123	02/11/11 08:25	
S106025-02	B28NP5-B1		WATER		RC-194	RC-194, 1102123	02/11/11 08:25	
S106025-03	B28NP5-B2		WATER		RC-194	RC-194, 1102123	02/11/11 08:25	
S106025-04	B28NP5-C1		WATER		RC-194	RC-194, 1102123	02/11/11 08:25	
S106025-05	Lab Control Sample		WATER		RC-194			
S106025-06	Method Blank		WATER		RC-194			

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 06/17/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

QC SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7499	RC-194, 1102123	B28NP5-A1	WATER		0.013 L		06/01/11 110	S106025-01	7499-001
		B28NP5-B1	WATER		0.048 L		06/01/11 110	S106025-02	7499-002
		B28NP5-B2	WATER		0.048 L		06/01/11 110	S106025-03	7499-003
		B28NP5-C1	WATER		0.050 L		06/01/11 110	S106025-04	7499-004
		Method Blank	WATER					S106025-06	7499-006
		Lab Control Sample	WATER					S106025-05	7499-005

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Hanford1
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 06/17/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG
Beta Counting										
SR	WATER	Total Strontium in Water	7302-068	10.4	4			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.

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

LAB WORK SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S106025-01 02/11/11 06/01/11	B28NP5-A1 RC-194, 1102123 RC-194		WATER	7499-001	SR		06/10/11	06/15/11	BW	Total Strontium in Water
S106025-02 02/11/11 06/01/11	B28NP5-B1 RC-194, 1102123 RC-194		WATER	7499-002	SR		06/10/11	06/15/11	BW	Total Strontium in Water
S106025-03 02/11/11 06/01/11	B28NP5-B2 RC-194, 1102123 RC-194		WATER	7499-003	SR		06/10/11	06/15/11	BW	Total Strontium in Water
S106025-04 02/11/11 06/01/11	B28NP5-C1 RC-194, 1102123 RC-194		WATER	7499-004	SR		06/10/11	06/15/11	BW	Total Strontium in Water
S106025-05	Lab Control Sample RC-194		WATER	7499-005	SR		06/10/11	06/15/11	BW	Total Strontium in Water
S106025-06	Method Blank RC-194		WATER	7499-006	SR		06/10/11	06/15/11	BW	Total Strontium in Water

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
SR	RC-194	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	4			1	1		6
TOTALS				4			1	1		6

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
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 Form DVD-LWS
 Version 3.06
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EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3159

7499-006

Method Blank

METHOD BLANK

SDG <u>7499</u>	Client/Case no <u>Hanford</u>	<u>SDG K3159</u>
Contact <u>N. Joseph Verville</u>	Contract <u>No. S00W235A00</u>	
Lab sample id <u>S106025-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7499-006</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>RC-194</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-3.05	12	<u>23.2</u>	2.00	U	SR

QC-BLANK #78698

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

7499-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7499</u> Contact <u>N. Joseph Verville</u> Lab sample id <u>S106025-05</u> Dept sample id <u>7499-005</u>	Client/Case no <u>Hanford</u> SDG <u>K3159</u> Contract <u>No. S00W235A00</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>RC-194</u>
---	--

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	1080	54	<u>23.6</u>	2.00	SR	954	38	113	80-120	80-120

QC-LCS #78697

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

Test SR Matrix WATER
 SDG 7499
 Contact N. Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN WATER
 BETA COUNTING

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3159

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 7302-068				
S106025-01		7499-001	B28NP5-A1	74.6
S106025-02		7499-002	B28NP5-B1	55.3
S106025-03		7499-003	B28NP5-B2	60.3
S106025-04		7499-004	B28NP5-C1	33.6
S106025-05		7499-005	Lab Control Sample	ok
S106025-06		7499-006	Method Blank	U
Nominal values and limits from method			RDLs (pCi/L)	2.00

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7302-068			2σ prep error 10.4 % Reference Lab Notebook No. 7302 pg.068												
S106025-01		B28NP5-A1	<u>26.8</u>	0.0130			65	100	119	06/10/11	06/10	GRB-221			
S106025-02		B28NP5-B1	<u>5.24</u>	0.0480			76	100	119	06/10/11	06/10	GRB-232			
S106025-03		B28NP5-B2	<u>4.63</u>	0.0480			82	100	119	06/10/11	06/10	GRB-222			
S106025-04		B28NP5-C1	<u>4.38</u>	0.0500			92	100	119	06/10/11	06/10	GRB-217			
S106025-05		Lab Control Sample	<u>23.6</u>	0.0100			89	120		06/10/11	06/10	GRB-225			
S106025-06		Method Blank	<u>23.2</u>	0.0100			87	120		06/10/11	06/10	GRB-227			
Nominal values and limits from method			2.00	0.0100			40-110	100			180				

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
 SPP-062 Sample Aliquoting, rev 1
 CP-380 Strontium in Water Samples, rev 5

AVERAGES ± 2 SD MDA 14.6 ± 21.8
 FOR 6 SAMPLES YIELD 82 ± 20

Lab id EBRLNE
 Protocol Hanford1
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 06/17/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499

Contact N. Joseph Verville

REPORT GUIDE

Client Hanford

Contract No. S00W235A00

Case no SDG K3159

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 06/17/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

REPORT GUIDE

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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 Protocol Hanford1
 Version Ver 1.0
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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499

Contact N. Joseph Verville

REPORT GUIDE

Client Hanford

Contract No. S00W235A00

Case no SDG K3159

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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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Hanford1

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

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.

REPORT GUIDES

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499

Contact N. Joseph Verville

Client Hanford

Contract No. S00W235A00

Case no SDG K3159

GUIDE, cont.

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3159

SDG 7499
 Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3159

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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SDG 7499
 Contact N. Joseph Verville

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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.

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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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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'

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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.
- * Preparation 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.

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- * 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

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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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RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 6/1/11 10:00 CoC No. PC-194 K3159

Container I.D. No. BOX Requested TAT (Days) 30 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 []
6. Number of samples in shipping container: 35 Sample Matrix SOIL, WATER
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:
Sample NP2 (WATER) MISSING #19, but has 2 tube for #20
14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by JHK Date: 6/1/11 Time: 15:30

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide
<u>All samples < 80</u>							

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. 100482 Calibration date 24 Sep 2010