SAF-RC-006
100-N Area D4 – Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Bill Rodgers X9-08 KW 12/11/12
INITIAL/DATE

COMMENTS:

SDG K4013 SAF-RC-006

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site(s): 1904-N Sludge

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

10 December 2012

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
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 #	1210067
SDG #	K4013
SAF #	RC-006
Date Received	10/23/12
# Samples	4
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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 18 pages.

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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R461	1210067-01	Other Solid	10/22/2012 09:25	10/23/2012 15:30
J1R462	1210067-02	Other Solid	10/22/2012 09:30	10/23/2012 15:30
J1R463	1210067-03	Other Solid	10/22/2012 09:39	10/23/2012 15:30
J1R464	1210067-04	Other Solid	10/22/2012 09:52	10/23/2012 15:30

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Case Narrative

Client: WC-HANFORD RC-006 K4013
LVL#: 1210067

W.O.#: 60049-001-001-0001-00
Date Received: 10-23-12

METALS

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) certifies that all test results meet the requirements of NELAC except as noted below.

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

1. This narrative covers the analyses of 4 other solid samples.

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

   The metals internal standard, Yttrium, was not used in the calculation of these data due to the native concentrations of Yttrium in the client samples.

   Sample J1R462 was analyzed and reported with a 5-fold dilution for Mercury due to high concentration of Mercury in the sample.

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

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

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

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

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

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

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

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10. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits.

11. For analytes where the MS is out of control, a post-digestion MS (PDS) is performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration levels for the following analytes: Aluminum, Iron, Zinc, and Silicon.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R461	Mercury	1.0	115.3

12. The duplicate analyses for 8 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Cadmium, Chromium, Nickel, Potassium, Silver, Vanadium, and Mercury were less than ten times the MDL.

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

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

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

for Iain Daniels
Laboratory Manager
Lionville Laboratory

12/10/12
Date

alm/10-067

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-006 Project Number: K4013 Project Manager: Joan Kessner	**Reported:** 10/30/2012 12:53

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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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

J1R461

1210067-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**139**		4.03	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Antimony	0.484	U	0.484	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Arsenic	0.806	U	0.806	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Barium	**15.8**		0.403	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Beryllium	0.161	U	0.161	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Boron	1.61	U	1.61	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Cadmium	**0.0922**	B	0.161	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Calcium	**618**		80.6	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Chromium	**0.780**		0.161	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Cobalt	1.61	U	1.61	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Copper	**15.6**		0.806	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Iron	**373**		16.1	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Lead	**1.03**		0.403	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Magnesium	**78.7**		60.5	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Manganese	**4.18**		4.03	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Molybdenum	**0.253**	B	1.61	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Nickel	**1.32**	B	3.23	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Potassium	**76.4**	B	323	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Selenium	0.242	U	0.242	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Silicon	**71.5**		1.61	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Silver	**0.355**		0.161	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Sodium	**56.3**		40.3	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Vanadium	**0.564**	B	2.02	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Zinc	**75.7**		8.06	mg/kg wet	1	L210203	10/24/2012	10/25/2012	6010B
Mercury	**0.0711**		0.0243	mg/kg wet	1	L210210	10/24/2012	10/25/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

J1R462
1210067-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**545**		4.03	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Antimony	**0.783**		0.484	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Arsenic	0.806	U	0.806	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Barium	**41.2**		0.403	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Beryllium	0.161	U	0.161	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Boron	**0.749**	B	1.61	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cadmium	**0.246**		0.161	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Calcium	**1890**		80.6	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Chromium	**3.90**		0.161	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cobalt	1.61	U	1.61	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Copper	**39.5**		0.806	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Iron	**1920**		16.1	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Lead	**2.78**		0.403	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Magnesium	**262**		60.5	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Manganese	**16.9**		4.03	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Molybdenum	**0.947**	B	1.61	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Nickel	**2.67**	B	3.23	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Potassium	**127**	B	323	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Selenium	**0.364**		0.242	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silicon	**86.2**		1.61	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silver	**1.03**		0.161	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Sodium	**72.1**		40.3	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Vanadium	**3.27**		2.02	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Zinc	**190**		8.06	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Mercury	**2.15**		0.115	mg/kg wet	5	L210210	10/24/2012	10/25/2012	7471A

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WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

J1R463
1210067-03 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**182**		3.85	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Antimony	0.462	U	0.462	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Arsenic	0.769	U	0.769	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Barium	**28.9**		0.385	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Beryllium	0.154	U	0.154	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Boron	**1.16**	B	1.54	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cadmium	**0.105**	B	0.154	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Calcium	**2270**		76.9	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Chromium	**0.952**		0.154	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cobalt	1.54	U	1.54	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Copper	**15.5**		0.769	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Iron	**507**		15.4	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Lead	**1.23**		0.385	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Magnesium	**180**		57.7	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Manganese	**12.4**		3.85	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Molybdenum	1.54	U	1.54	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Nickel	**0.822**	B	3.08	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Potassium	**183**	B	308	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Selenium	**0.275**		0.231	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silicon	**78.0**		1.54	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silver	**1.11**		0.154	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Sodium	**110**		38.5	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Vanadium	**0.600**	B	1.92	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Zinc	**64.4**		7.69	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Mercury	**0.0919**		0.0257	mg/kg wet	1	L210210	10/24/2012	10/25/2012	7471A

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2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

J1R464
1210067-04 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**195**		3.97	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Antimony	0.476	U	0.476	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Arsenic	0.794	U	0.794	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Barium	**31.7**		0.397	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Beryllium	0.159	U	0.159	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Boron	**1.33**	B	1.59	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cadmium	**0.115**	B	0.159	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Calcium	**2650**		79.4	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Chromium	**0.913**		0.159	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Cobalt	1.59	U	1.59	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Copper	**17.2**		0.794	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Iron	**583**		15.9	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Lead	**1.19**		0.397	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Magnesium	**211**		59.5	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Manganese	**14.7**		3.97	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Molybdenum	1.59	U	1.59	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Nickel	**1.32**	B	3.17	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Potassium	**254**	B	317	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Selenium	**0.302**		0.238	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silicon	**84.7**		1.59	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Silver	**1.26**		0.159	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Sodium	**158**		39.7	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Vanadium	**0.702**	B	1.98	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Zinc	**72.8**		7.94	mg/kg wet	1	L210203	10/24/2012	10/26/2012	6010B
Mercury	**0.0988**		0.0281	mg/kg wet	1	L210210	10/24/2012	10/25/2012	7471A

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Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210203 - SW 3050B										
Blank (L210203-BLK1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
Aluminum	4.55	U	4.55	mg/kg wet						
Antimony	0.545	U	0.545	mg/kg wet						
Arsenic	0.909	U	0.909	mg/kg wet						
Barium	0.455	U	0.455	mg/kg wet						
Beryllium	0.182	U	0.182	mg/kg wet						
Boron	1.82	U	1.82	mg/kg wet						
Cadmium	0.182	U	0.182	mg/kg wet						
Calcium	90.9	U	90.9	mg/kg wet						
Chromium	0.182	U	0.182	mg/kg wet						
Cobalt	1.82	U	1.82	mg/kg wet						
Copper	0.909	U	0.909	mg/kg wet						
Iron	18.2	U	18.2	mg/kg wet						
Lead	0.455	U	0.455	mg/kg wet						
Magnesium	68.2	U	68.2	mg/kg wet						
Manganese	4.55	U	4.55	mg/kg wet						
Molybdenum	1.82	U	1.82	mg/kg wet						
Nickel	3.64	U	3.64	mg/kg wet						
Potassium	364	U	364	mg/kg wet						
Selenium	0.273	U	0.273	mg/kg wet						
Silicon	1.82	U	1.82	mg/kg wet						
Silver	0.182	U	0.182	mg/kg wet						
Sodium	45.5	U	45.5	mg/kg wet						
Vanadium	2.27	U	2.27	mg/kg wet						
Zinc	9.09	U	9.09	mg/kg wet						
Duplicate (L210203-DUP1)			**Source: 1210067-01**	Prepared: 10/24/2012 Analyzed: 10/26/2012						
Aluminum	195		3.57	mg/kg wet		139			34*	20
Antimony	0.429	U	0.429	mg/kg wet		0.484 U				20
Arsenic	0.714	U	0.714	mg/kg wet		0.806 U				20
Barium	21.2		0.357	mg/kg wet		15.8			29*	20
Beryllium	0.143	U	0.143	mg/kg wet		0.161 U				20
Boron	0.441	B	1.43	mg/kg wet		1.61 U				20
Cadmium	0.143		0.143	mg/kg wet		0.0922			43*	20
Calcium	866		71.4	mg/kg wet		618			33*	20
Chromium	1.19		0.143	mg/kg wet		0.780			42*	20
Cobalt	1.43	U	1.43	mg/kg wet		1.61 U				20
Copper	22.7		0.714	mg/kg wet		15.6			37*	20

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2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

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 L210203 - SW 3050B										
Duplicate (L210203-DUP1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
Iron	528		14.3	mg/kg wet		373			34*	20
Lead	1.25		0.357	mg/kg wet		1.03			19	20
Magnesium	112		53.6	mg/kg wet		78.7			35*	20
Manganese	6.05		3.57	mg/kg wet		4.18			37*	20
Molybdenum	0.286	B	1.43	mg/kg wet		0.253			12	20
Nickel	0.972	B	2.86	mg/kg wet		1.32			30*	20
Potassium	99.0	B	286	mg/kg wet		76.4			26*	20
Selenium	0.279		0.214	mg/kg wet		0.242 U				20
Silicon	75.1		1.43	mg/kg wet		71.5			5	20
Silver	0.486		0.143	mg/kg wet		0.355			31*	20
Sodium	68.2		35.7	mg/kg wet		56.3			19	20
Vanadium	0.813	B	1.79	mg/kg wet		0.564			36*	20
Zinc	104		7.14	mg/kg wet		75.7			32*	20
Matrix Spike (L210203-MS1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
Aluminum	407		3.68	mg/kg wet	147.06	139	182*	75-125		
Antimony	34.3		0.441	mg/kg wet	36.765	0.484 U	93	75-125		
Arsenic	140		0.735	mg/kg wet	147.06	0.806 U	95	75-125		
Barium	181		0.368	mg/kg wet	147.06	15.8	113	75-125		
Beryllium	3.74		0.147	mg/kg wet	3.6765	0.161 U	102	75-125		
Boron	65.4		1.47	mg/kg wet	73.529	1.61 U	89	75-125		
Cadmium	3.58		0.147	mg/kg wet	3.6765	0.0922	95	75-125		
Calcium	2720		73.5	mg/kg wet	1838.2	618	114	75-125		
Chromium	15.0		0.147	mg/kg wet	14.706	0.780	97	75-125		
Cobalt	34.0		1.47	mg/kg wet	36.765	1.61 U	93	75-125		
Copper	37.9		0.735	mg/kg wet	18.382	15.6	121	75-125		
Iron	611		14.7	mg/kg wet	73.529	373	324*	75-125		
Lead	34.0		0.368	mg/kg wet	36.765	1.03	90	75-125		
Magnesium	1940		55.1	mg/kg wet	1838.2	78.7	101	75-125		
Manganese	42.8		3.68	mg/kg wet	36.765	4.18	105	75-125		
Molybdenum	71.0		1.47	mg/kg wet	73.529	0.253	96	75-125		
Nickel	34.7		2.94	mg/kg wet	36.765	1.32	91	75-125		
Potassium	2040		294	mg/kg wet	1838.2	76.4	107	75-125		
Selenium	132		0.221	mg/kg wet	147.06	0.242 U	90	75-125		
Silicon	117		1.47	mg/kg wet	73.529	71.5	61*	75-125		
Silver	4.11		0.147	mg/kg wet	3.6765	0.355	102	75-125		
Sodium	2050		36.8	mg/kg wet	1838.2	56.3	108	75-125		

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

WC-Hanford, Inc.	Project: RC-006	
2620 Fermi Avenue	Project Number: K4013	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/30/2012 12:53

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 L210203 - SW 3050B										
Matrix Spike (L210203-MS1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
Vanadium	39.3		1.84	mg/kg wet	36.765	0.564	105	75-125		
Zinc	138		7.35	mg/kg wet	36.765	75.7	169*	75-125		
Post Spike (L210203-PS1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/26/2012						
Aluminum	24900			ug/L	22000	1720	105	75-125		
Iron	27200			ug/L	22000	4620	103	75-125		
Silicon	1970			ug/L	1200.0	886	90	75-125		
Zinc	1100			ug/L	200.00	939	78	75-125		
Batch L210210 - SW 7471A Prep										
Blank (L210210-BLK1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
Mercury	0.0273	U	0.0273	mg/kg wet						
Duplicate (L210210-DUP1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Mercury	0.0547		0.0250	mg/kg wet		0.0711			26.0*	20
Matrix Spike (L210210-MS1)		**Source: 1210067-01**		Prepared: 10/24/2012 Analyzed: 10/25/2012						
Mercury	0.247		0.0243	mg/kg wet	0.13514	0.0711	130*	75-125		
Reference (L210210-SRM1)				Prepared: 10/24/2012 Analyzed: 10/25/2012						
Mercury	1.21		0.0281	mg/kg wet	1.2900		93.6	62.6-138		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L210203
Date/Time Initiated: 10/24/12 1955
Date/Time Completed: 10/25/12 1210
Analyst: CLR
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 94°
BLOCK 1 2 (circle one)
CLR 10/24/12

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
1210067-01		0.62	50		TOT	fine	Brown Sludge	NA	NA
L210203-DUP1		0.70	50			fine	Brown Sludge		
MS1	0.5	0.68	50			fine	Brown Sludge		
02		0.62	50			fine	Dark Sludge		
03		0.65	50			fine	Dark Sludge		
04		0.63	50			fine	Dark Sludge		
1210071-01		0.65	50			fine	Gray Sand		
L210203-DUP2		0.65	50			fine	Gray Sand		
MS2	0.5	0.66	50			fine	Gray Sand		
02		0.66	50			fine	Brown Soil		
03		0.52	50			fine	Dark Sand		
04		0.52	50			fine	Brown Soil		
05		0.56	50			fine	Gray Sandy		
06		0.55	50			fine	Brown Soil		
07		0.59	50			fine	Brown Soil		
08		0.61	50			fine	Brown Soil		
09		0.54	50			fine	Brown Soil		
10		0.53	50			fine	Brown Sandy		
11		0.56	50			fine	Gray Sandy		
12		0.68	50			fine	Brown Soil		
13		0.62	50			fine	Dark Sand		
L210203-BLK		0.55	50			COARSE	Boiling Chips		
SRM	*	0.54	50			fine	Pink Loamy		

CLR 10/25/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: * 1201014

Reagent IDs:
HNO_3 L08023
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-044-02
1:1 HCl

File ID#:

Data Review By/Date: CLR 10/26/12

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

Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: CLB
Date 10/24/12 (weighed)
Start Time/Temp: 1220 | 95° (10/25/12)
End Time/Temp: 1255 | 95° ⊥

Instrument ID: HG-3.1
Balance # B14 /NA
Pipette Calibration (Daily) (Y) ✓

Prep Batch: L210210
Worksheet: HG102501
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 µg/L		0.100		10mL	50	
1.0		0.500		10mL	50	
2.0		1.000		10mL	50	
5.0		2.500		10mL	50	
10.0		5.000		10mL	50	
ICV		0.125	2.5	10mL	50	
CCV		0.250	5.0	10mL	50	
ICB/CCB				10mL	50	
L210210-BLK1				0.33	50	
SRM1		*	*	0.32	50	
1210067-01				0.37	50	
L210210-Dup1				0.36	50	
MS1		0.5	1.0	0.37	50	
02				0.39	50	
03				0.35	50	
04				0.32	50	
1210069-01				0.33	50	
L210210-Dup2				0.31	50	
MS2		0.5	1.0	0.38	50	
02				0.32	50	
03				0.36	50	
04				0.35	50	
05				0.32	50	
06				0.37	50	
07				0.38	50	
08				0.38	50	

Standard:	ID	Prep Date/Time
ICAL/MS	R1 1201235	10/25/12 10:00
ICV/CCV/LCS	IV 1200532	NA

Reviewed By/Date: [signature] 10/26/12

se book # 1153 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1201014

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

ME-HgCVAA-Prep0910

Page #:

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: TEB
Date 10/24/12
Start Time/Temp: see page
End Time/Temp: 049

Instrument ID: HG3.1
Balance # B14 /NA
Pipette Calibration (Daily) ✓

Prep Batch: L210210
Worksheet: HG102501
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.
1210069 - 09				0.32	50	
10				0.35	50	

TEB 10/25/12

Standard:	ID	Prep Date/Time
ICAL/MS		
ICV/CCV/LCS		

Reviewed By/Date: [illegible] 10/26/12

see book # 1153 for std traceability information

Soil LCS True Value = see page 048A 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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Lionville Laboratory Use Only

1210067

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford RC-006

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: SH TAT: 7 Days

Date Rec'd: ~~10/24/12~~ 10/23/12 Date Due: 10/30/12

Refrigerator #		A													
#/Type Container	Liquid	1													
	Solid	1AG													
Volume	Liquid	60													
	Solid														
Preservatives		–													
ANALYSES REQUESTED →		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb				Metal	Hg CN					
		Lionville Laboratory Use Only													
									METALS						

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	J1R461			SL	10-22-12	0925							X						
02	2					0930							X						
03	3					0939							X						
04	4					0952							X						

Special Instructions:
OTHER: Sewage Sludge
METALS = HSL + B, Mo, Si (NOTL)

Special Instructions:
1. HOLD FOR POSSIBLE SUBSEQUENT TCLP
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	K. Kennedy	10/23/12	1530

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-006-372	Page 1 of 1

Collector: R. Strickland	Company Contact: Bill Rodgers	Telephone No.: 206.251.7439	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: ~~15 Days~~ 7		
Project Designation: 100-N Area D4 - Other	Sampling Location: 1904-N Sludge		SAF No.: RC-006
Ice Chest No.: WCH-12-014	Field Logbook No.: EL-1516-21	COA: RD4MXX2F00	Method of Shipment: FedEx
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A110420		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Sewage Sludge

Special Handling and/or Storage

~~None~~ 10/22/12

COOL TO 4°

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	60mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions.											

Sample No.	Matrix *	Sample Date	Sample Time										
J1R461	OTHER	10-22-12	0925	X									
J1R462	OTHER	10-22-12	0930	X									
J1R463	OTHER	10-22-12	0939	X									
J1R464	OTHER	10-22-12	0952	X									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. STRICKLAND WCH	10/22/12 1120	R. STRICKLAND MD 767 FRIDGE	10/22/12 1120
R. STRICKLAND WCH MD 767 FRIDGE	10/22/12 1400	FED EX	
FED EX	10/23/12 1530	VICTOR HERNANDEZ	10/23/12 1530

SPECIAL INSTRUCTIONS

HOLD FOR POSSIBLE SUBSEQUENT TCLP

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

REVIEWED BY JRP DATE 10/22/12

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

0000000017

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-006

Date: 10/23/12

LvL Batch #: 1210067

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FED EX		Airbill # 7939 0250 4551
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 2.1°	°C	Cooler # WCH-12-014
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 _____

SR-002-B.doc