SAF-RC-150
300 Area D4 Waste Sites – Other
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 1/16/13
INITIAL/DATE

COMMENTS:

SDG K4037 SAF-RC-150

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 300 RRLWS – Interior of Valve Box 4 (Surfaces)

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

11 January 2013

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 #	1212017
SDG #	K4037
SAF #	RC-150
Date Received	12/04/12
# Samples	2
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

R:\GROUP\PM\ORLETTE\Hanford\Data\B_ltrs.DOC

CHAIN OF CUSTODY

Lionville Laboratory Use Only
1212017

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: W.C. Hanford SAF # RC-150

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: Orlette Johnson

QC: SW Del: Std TAT: 15

Date Rec'd: 12.4.12 Date Due: 12-19-12

Refrigerator #																A							
#/Type Container	Liquid															2							
	Solid															1pl							
Volume	Liquid																						
	Solid															60							
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	METALS
01	JIR639			Wi	11.28.12	1100	X
02	JIR640			✓	✓	1110	X

Special Instructions:

METALS = HSL + B, Li, Mo, Si, U, Zr (NOTL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	12.4.12	10:10

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-150-038	Page 1 of 1

Collector M. Riddell	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH
Project Designation 300 Area D4 Waste Sites - Other	**Sampling Location** 300 RLWS - Interior of Valve Box 4 (Surfaces)		**SAF No.** RC-150
Ice Chest No. ~~N/A~~ AJ 12-3-12 WCH-11-071	**Field Logbook No.** EL-1663-04	**COA** R3RLWS2600	**Method of Shipment** Fed Ex/Hand Deliver
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE RCF AJ 12-3-12	**Offsite Property No.** ~~N/A~~ AJ 12-3-12 A120649		**Bill of Lading/Air Bill No.** See OSPC

Price Code ~~9L~~ 9G — **Data Turnaround** ~~21~~ 15 Days — WCB 11/28/2012 — CMB 11/28/12

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential Radioactive~~ < Dot limits 12-3-12 CMB

Special Handling and/or Storage

Cool 4C

* Cooling not maintained. AJ 12-3-12

Preservation	Cool 4C	None										
Type of Container	G/P	G/P										
No. of Container(s)	1	0										
Volume	60mL	60mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions. *	RCF GEA Shipping Screen AJ 12-3-12										

Sample No.	Matrix *	Sample Date	Sample Time			RCF							
J1R639	OTHER	11/28/2012	1100	✓	✓	35034							
J1R640	OTHER	11/28/2012	1110	✓	✓	35035							

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Mike Riddell [signature]	11-28-12 16:20	David Becker [signature]	11/28/12 1620
David Becker [signature]	11/28/12 1730	1060, #3B *	11/28/12 1730
1060 #3B	11-29-12 0847	A. Freier [signature]	11-29-12 0847
A. Freier [signature]	WCH 11-29-12 0900	M. Rook [signature] RCF	11-29-12 0900
[signature]	12-3-12 0855 RCF	A. Freier [signature]	12-3-12 0855
A. Freier [signature]	WCH 12-3-12 1000	Fed Ex	

SPECIAL INSTRUCTIONS

* Trans ship sample designated for RCF Shipping Screen to Lionville * [Cooling not maintained].

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

*

Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

REVIEWED BY CMB DATE 12-3-12

Matrix *

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

LABORATORY SECTION	Received By [signature] Ex 12-4-12/10:10 DSM [signature]	Title 12-4-12/10:10	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release # RC.150

Date: 12.4.12

LvL Batch #: 1212017

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7942 0293 0936
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 18.8	°C	Cooler # WCH-11-071
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-0412.doc

METALS

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

WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4037	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/19/2012 08:25

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R639	1212017-01	Other Solid	11/28/2012 11:00	12/04/2012 10:10
J1R640	1212017-02	Other Solid	11/28/2012 11:10	12/04/2012 10:10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-150
LVL#: 1212017
SDG/SAF#: K4037/RC-150

W.O.#: 60049-001-001-0001-00
Date Received: 12-04-12

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 2 other solid (wipe) samples.

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

   Each sample was divided into four, approximately equal, parts. One-fourth part of each sample was digested for ICP metals analyses and one-fourth part was digested for Mercury analysis. A duplicate and a matrix spike were performed for each analysis (sample J1R639 for ICP metals and sample J1R640 for Mercury). The initial weight for each digestate was a fourth of the original wipe.

   The samples were analyzed and reported with 5-fold dilutions for Mercury due to high concentration of Mercury in the sample.

   Samples J1R639, L212147-DUP1, and L212147-MS1 were reanalyzed and reported with 6-fold dilutions for Zinc due to high concentration of Zinc 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).

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

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

9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon (13.1%).

10. The matrix spike (MS) recoveries for 8 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, Chromium, Copper, Iron, Nickel, Mercury, Zinc, and Silicon.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R640	Mercury	1.0	111.6

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

12/20/19
Date

alm/12-017

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

WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4037	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/19/2012 08:25

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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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

J1R639
1212017-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**660**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Antimony	**11.2**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Arsenic	4.00	U	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Barium	**13.3**		2.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Beryllium	0.800	U	0.800	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Boron	**4.43**	B	8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Cadmium	**2.61**		1.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Calcium	**2710**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Chromium	**373**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Cobalt	**4.92**	B	12.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Copper	**52.1**		8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Iron	**7590**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Lead	**89.5**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Lithium	8.00	U	8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Magnesium	**524**		20.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Manganese	**76.8**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Molybdenum	**4.57**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Nickel	**352**		10.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Potassium	**706**		400	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Selenium	4.00	U	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Silicon	**377**		24.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Silver	**1.26**	B	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Sodium	**3420**		200	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Uranium	40.0	U	40.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Vanadium	**5.42**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Zinc	**7850**		72.0	ug/sample	6	L212147	12/17/2012	12/18/2012	6010B
Zirconium	**24.9**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Mercury	**2.25**		0.200	ug/sample	5	L212150	12/17/2012	12/18/2012	7471A

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

J1R640
1212017-02 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**626**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Antimony	**30.4**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Arsenic	**1.29**	B	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Barium	**14.6**		2.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Beryllium	0.800	U	0.800	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Boron	**5.42**	B	8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Cadmium	**1.91**		1.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Calcium	**1590**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Chromium	**397**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Cobalt	**5.76**	B	12.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Copper	**68.4**		8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Iron	**10200**		80.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Lead	**67.8**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Lithium	8.00	U	8.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Magnesium	**491**		20.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Manganese	**101**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Molybdenum	**4.75**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Nickel	**298**		10.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Potassium	**945**		400	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Selenium	**1.48**	B	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Silicon	**252**		24.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Silver	4.00	U	4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Sodium	**2790**		200	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Uranium	40.0	U	40.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Vanadium	**4.69**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Zinc	**1970**		12.0	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Zirconium	**10.0**		4.00	ug/sample	1	L212147	12/17/2012	12/18/2012	6010B
Mercury	**3.07**		0.200	ug/sample	5	L212150	12/17/2012	12/18/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

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 L212147 - SW 3050B										
Blank (L212147-BLK1)				Prepared: 12/17/2012 Analyzed: 12/18/2012						
Aluminum	20.0	U	20.0	ug/sample						
Antimony	1.00	U	1.00	ug/sample						
Arsenic	1.00	U	1.00	ug/sample						
Barium	0.500	U	0.500	ug/sample						
Beryllium	0.200	U	0.200	ug/sample						
Boron	2.00	U	2.00	ug/sample						
Cadmium	0.250	U	0.250	ug/sample						
Calcium	20.0	U	20.0	ug/sample						
Chromium	1.00	U	1.00	ug/sample						
Cobalt	3.00	U	3.00	ug/sample						
Copper	2.00	U	2.00	ug/sample						
Iron	20.0	U	20.0	ug/sample						
Lead	1.00	U	1.00	ug/sample						
Lithium	2.00	U	2.00	ug/sample						
Magnesium	5.00	U	5.00	ug/sample						
Manganese	1.00	U	1.00	ug/sample						
Molybdenum	1.00	U	1.00	ug/sample						
Nickel	2.50	U	2.50	ug/sample						
Potassium	100	U	100	ug/sample						
Selenium	1.00	U	1.00	ug/sample						
Silicon	6.00	U	6.00	ug/sample						
Silver	1.00	U	1.00	ug/sample						
Sodium	50.0	U	50.0	ug/sample						
Uranium	10.0	U	10.0	ug/sample						
Vanadium	1.00	U	1.00	ug/sample						
Zinc	3.00	U	3.00	ug/sample						
Zirconium	1.00	U	1.00	ug/sample						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

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 L212147 - SW 3050B									
LCS (L212147-BS1)			Prepared: 12/17/2012 Analyzed: 12/18/2012						
Aluminum	238	20.0	ug/sample	250.00		95	80-120		
Antimony	150	1.00	ug/sample	150.00		100	80-120		
Arsenic	486	1.00	ug/sample	500.00		97	80-120		
Barium	248	0.500	ug/sample	250.00		99	80-120		
Beryllium	11.9	0.200	ug/sample	12.500		95	80-120		
Boron	237	2.00	ug/sample	250.00		95	80-120		
Cadmium	11.6	0.250	ug/sample	12.500		93	80-120		
Calcium	1210	20.0	ug/sample	1250.0		96	80-120		
Chromium	24.4	1.00	ug/sample	25.000		98	80-120		
Cobalt	123	3.00	ug/sample	125.00		98	80-120		
Copper	62.2	2.00	ug/sample	62.500		100	80-120		
Iron	242	20.0	ug/sample	250.00		97	80-120		
Lead	118	1.00	ug/sample	125.00		94	80-120		
Lithium	249	2.00	ug/sample	250.00		100	80-120		
Magnesium	1180	5.00	ug/sample	1250.0		95	80-120		
Manganese	36.0	1.00	ug/sample	37.500		96	80-120		
Molybdenum	256	1.00	ug/sample	250.00		103	80-120		
Nickel	97.6	2.50	ug/sample	100.00		98	80-120		
Potassium	1200	100	ug/sample	1250.0		96	80-120		
Selenium	462	1.00	ug/sample	500.00		92	80-120		
Silicon	32.9	6.00	ug/sample	250.00		13*	80-120		
Silver	24.3	1.00	ug/sample	25.000		97	80-120		
Sodium	1240	50.0	ug/sample	1250.0		99	80-120		
Uranium	248	10.0	ug/sample	250.00		99	80-120		
Vanadium	125	1.00	ug/sample	125.00		100	80-120		
Zinc	49.4	3.00	ug/sample	50.000		99	80-120		
Zirconium	242	1.00	ug/sample	250.00		97	80-120		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

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 L212147 - SW 3050B										
Duplicate (L212147-DUP1)		**Source: 1212017-01**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Aluminum	655		80.0	ug/sample		660			0.9	20
Antimony	11.7		4.00	ug/sample		11.2			5	20
Arsenic	4.00	U	4.00	ug/sample		4.00 U				20
Barium	13.8		2.00	ug/sample		13.3			4	20
Beryllium	0.800	U	0.800	ug/sample		0.800 U				20
Boron	4.60	B	8.00	ug/sample		4.43			4	20
Cadmium	2.57		1.00	ug/sample		2.61			2	20
Calcium	2540		80.0	ug/sample		2710			6	20
Chromium	318		4.00	ug/sample		373			16	20
Cobalt	4.99	B	12.0	ug/sample		4.92			1	20
Copper	56.4		8.00	ug/sample		52.1			8	20
Iron	7020		80.0	ug/sample		7590			8	20
Lead	80.2		4.00	ug/sample		89.5			11	20
Lithium	8.00	U	8.00	ug/sample		8.00 U				20
Magnesium	502		20.0	ug/sample		524			4	20
Manganese	74.0		4.00	ug/sample		76.8			4	20
Molybdenum	3.81	B	4.00	ug/sample		4.57			18	20
Nickel	358		10.0	ug/sample		352			2	20
Potassium	691		400	ug/sample		706			2	20
Selenium	4.00	U	4.00	ug/sample		4.00 U				20
Silicon	345		24.0	ug/sample		377			9	20
Silver	1.19	B	4.00	ug/sample		1.26			5	20
Sodium	3290		200	ug/sample		3420			4	20
Uranium	40.0	U	40.0	ug/sample		40.0 U				20
Vanadium	5.12		4.00	ug/sample		5.42			6	20
Zinc	7470		72.0	ug/sample		7850			5	20
Zirconium	10.2		4.00	ug/sample		24.9			84*	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

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 L212147 - SW 3050B									
Matrix Spike (L212147-MS1)		**Source: 1212017-01**	Prepared: 12/17/2012 Analyzed: 12/18/2012						
Aluminum	1700	80.0	ug/sample	400.00	660	260*	75-125		
Antimony	111	4.00	ug/sample	100.00	11.2	99	75-125		
Arsenic	388	4.00	ug/sample	400.00	4.00 U	97	75-125		
Barium	399	2.00	ug/sample	400.00	13.3	97	75-125		
Beryllium	9.37	0.800	ug/sample	10.000	0.800 U	94	75-125		
Boron	193	8.00	ug/sample	200.00	4.43	94	75-125		
Cadmium	12.0	1.00	ug/sample	10.000	2.61	94	75-125		
Calcium	7790	80.0	ug/sample	5000.0	2710	102	75-125		
Chromium	488	4.00	ug/sample	40.000	373	290*	75-125		
Cobalt	102	12.0	ug/sample	100.00	4.92	97	75-125		
Copper	117	8.00	ug/sample	50.000	52.1	129*	75-125		
Iron	8800	80.0	ug/sample	200.00	7590	606*	75-125		
Lead	189	4.00	ug/sample	100.00	89.5	100	75-125		
Lithium	191	8.00	ug/sample	200.00	8.00 U	96	75-125		
Magnesium	5290	20.0	ug/sample	5000.0	524	95	75-125		
Manganese	193	4.00	ug/sample	100.00	76.8	116	75-125		
Molybdenum	205	4.00	ug/sample	200.00	4.57	100	75-125		
Nickel	523	10.0	ug/sample	100.00	352	171*	75-125		
Potassium	5420	400	ug/sample	5000.0	706	94	75-125		
Selenium	381	4.00	ug/sample	400.00	4.00 U	95	75-125		
Silicon	851	24.0	ug/sample	200.00	377	237*	75-125		
Silver	9.94	4.00	ug/sample	10.000	1.26	87	75-125		
Sodium	8170	200	ug/sample	5000.0	3420	95	75-125		
Uranium	967	40.0	ug/sample	1000.0	40.0 U	97	75-125		
Vanadium	104	4.00	ug/sample	100.00	5.42	98	75-125		
Zinc	7860	72.0	ug/sample	100.00	7850	4*	75-125		
Zirconium	946	4.00	ug/sample	1000.0	24.9	92	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4037 Project Manager: Joan Kessner	**Reported:** 12/19/2012 08:25

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 L212147 - SW 3050B										
Post Spike (L212147-PS1)		**Source: 1212017-01**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Aluminum	5330			ug/L	2000.0	3300	101	75-125		
Chromium	2920			ug/L	1100.0	1860	96	75-125		
Copper	375			ug/L	100.00	261	114	75-125		
Iron	58800			ug/L	22000	38000	95	75-125		
Nickel	2880			ug/L	1100.0	1760	102	75-125		
Silicon	3260			ug/L	1100.0	1890	125	75-125		
Zinc	45600			ug/L	6600.0	39300	97	75-125		
Batch L212150 - SW 7471A Prep										
Blank (L212150-BLK1)				Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	0.0100	U	0.0100	ug/sample						
LCS (L212150-BS1)				Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	0.262		0.0100	ug/sample	0.25000		105	80-120		
Duplicate (L212150-DUP1)		**Source: 1212017-02**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	2.64		0.200	ug/sample		3.07			15.1	20
Matrix Spike (L212150-MS1)		**Source: 1212017-02**		Prepared: 12/17/2012 Analyzed: 12/18/2012						
Mercury	3.64		0.200	ug/sample	0.20000	3.07	285*	75-125		

Lionville Laboratory

Logbook #: 1194

SAMPLE DIGESTION RECORD

Digestion Batch #: L212147 WE PW 12/17/12
Date/Time Initiated: 12/17/12 ~~1000~~ 1140
Date/Time Completed: 12/17/12 2030
Analyst: PW
Matrix (circle): Soil Water Other wipe
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 #: B14
Balance Cal Verification: Y NA
Temp: 94°
BLOCK 1 2 3 (circle one)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1212017-01		1/4 wipe	50		TO		foam stained wipe		
L212147-DUP1		1/4 wipe	50						
MS1	0.5*	1/4 wipe	50						
1212017-02		1/4 wipe	50						
L212147-BLK1		1	50				boiling chips		
BS1	0.5*	1	50						

PW 12/17/12

Spiking IDs / Expiration Date:
MS#: 1201581
LCS#: 1201583

Reagent IDs:
HNO_3 0000003390
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date: [illegible] 12/19/12

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

* also - 0.25ml 1200380 (U-)
0.25ml 1200386 (Zr)

Each wipe divided into 4 approximately equal portions. 3 portions of sample 01 for ICP matrix QC, 3 portions of sample 02 for Hg matrix QC.

Page #: 16

000000018

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MERCURY PREPARATION

Analyst: [illegible]
Date 12/17/12
Start Time/Temp: 1750/94°
End Time/Temp: 1820/98°

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

Logbook # 1153
Prep Batch: L212150
Worksheet: HG121801/HG121802
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				10 ml	50	
0.2 µg/L		0.100		10 ml	50	
1.0 µg/L		0.500		10 ml	50	
2.0 µg/L		1.000		10 ml	50	
5.0 µg/L		2.500		10 ml	50	
10.0 µg/L		5.000		10 ml	50	
ICV		0.125	2.5	10 ml	50	
CCV		0.250	5.0	10 ml	50	
ICB/CCB				10 ml	50	
L212150-BLK1				1	50	
BS1		0.250	5.0	1	50	
1212017-01				1/4 wipe	50	
02				1/4 wipe	50	
L212150-DUP1				1/4 wipe	50	
MS1		0.500	1.0	1/4 wipe	50	

[illegible] 12/17/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	12/17/12 1235
ICV/CCV/LCS	(IV. 1201411)	N/A

Reviewed By/Date: ____

see book # 1153 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard # ____

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

ME-HgCVAA-Prep0910

Page #:

000000019