SAF-RC-225
100K Remaining Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 1/24/13
INITIAL/DATE

COMMENTS:

SDG KP0172 SAF-RC-225

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-K-91

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

22 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 #	1301010
SDG #	KP0172
SAF #	RC-225
Date Received	01/04/13
# Samples	1
Matrix	SOIL
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.

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CHAIN OF CUSTODY

Lionville Laboratory Use Only

1301010

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 SAF# RC-225
Est. Final Proj. Sampling Date:
Project#: KP0172
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SW TAT: 7 Days
Date Rec'd: 1/4/13 Date Due: 1/11/13

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

ANALYSES REQUESTED

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb				INORG Metal	Hg	CN						
														A								
														2								
														1 Plastic								
														125								
														1								
							Lionville Laboratory Use Only															
														METALS								
01	T1R7F3	✓	✓	Soil	12-31-12	0820								X								

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

Special Instructions: /
METALS = HSL + B, Mo, Si (P)

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

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	1/4/13	1025

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-225-082	Page 1 of 1
Collector Brackett, R	Company Contact Joan Kessner	Telephone No. (509) 375-4688	Project Coordinator KESSNER, JH	Price Code 8B Data Turnaround 7 Days
Project Designation 100K Remaining Waste Sites - Soil In-Process	Sampling Location 100-K-91		SAF No. RC-225	
Ice Chest No. WCH-12-021	Field Logbook No. EL-1666	COA 010K912600	Method of Shipment FedEx	
Shipped To EBERLINE SERVICES / LIONVILLE DWS 12/31/12	Offsite Property No. A120~~628~~87		Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	AJ 1-2-13									
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time										
J1R7F3	SOIL	12/31/12	0820	X									
~~J1R7F4~~ BH 12/31/12	SOIL												

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Rob Brackett RB	12-31-12 1045	BHUDSON BHudson	12/31/12 1045
BHUDSON BHudson	12/31/12 1050	DWShea DWSHEA	12/31/12 1050
DWShea DWSHEA	12/31/12	DWShea DWSHEA	12/31/12
DWShea DWSHEA	12/31/12 1222	Cindy Bingham	12-31-12 1222
Cindy Bingham	1-2-13 1240 1060#1	Fed Ex	
Fed Ex	1-4-13 1025	VICTOR HERNANDEZ	1-4-13 1025

SPECIAL INSTRUCTIONS

(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) {Mercury}

DWShea 12/31/12

REVIEWED BY AJ DATE 1-2-13

KP0172

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

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

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-225

Date: 1/4/13

LvL Batch #: 1301010

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7944 2753 5476
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** 2.3	°C	Cooler # WCH-12-021
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, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) 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-1112.doc

METALS

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R7F3	1301010-01	Soil	12/31/2012 08:20	01/04/2013 10:25

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-225
LVL#: 1201010
SDG/SAF#: KP0172/RC-225

W.O.#: 60049-001-001-0001-00
Date Received: 01-04-13

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 1 soil sample.

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

   The sample was analyzed and reported with a 3-fold dilution for ICP metals due to sample matrix.

   The sample was analyzed and reported with a 2-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.

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 6 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, Antimony, Iron, Mercury Silicon, and Zinc.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R7F3	Mercury	1.0	96.1

12. The duplicate analysis for 1 analyte was 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.

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

1/15/13
Date

alm/01-010

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

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-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

J1R7F3
1301010-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**9030**		14.1	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Antimony	1.69	U	1.69	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Arsenic	**2.61**	B	2.82	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Barium	**63.3**		1.41	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Beryllium	**0.336**	B	0.564	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Boron	**1.70**	B	5.64	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Cadmium	0.564	U	0.564	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Calcium	**4510**		282	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Chromium	**10.8**		0.564	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Cobalt	**6.80**		5.64	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Copper	**14.8**		2.82	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Iron	**21100**		56.4	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Lead	**4.34**		1.41	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Magnesium	**3840**		211	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Manganese	**318**		14.1	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Molybdenum	5.64	U	5.64	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Nickel	**12.5**		11.3	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Potassium	**3650**		1130	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Selenium	0.845	U	0.845	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Silicon	**312**		5.64	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Silver	0.564	U	0.564	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Sodium	**291**		141	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Vanadium	**52.8**		7.04	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Zinc	**109**		28.2	mg/kg dry	3	L301032	01/07/2013	01/09/2013	6010B
Mercury	**1.48**		0.0525	mg/kg dry	2	L301036	01/07/2013	01/08/2013	7471A

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

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 L301032 - SW 3050B										
Blank (L301032-BLK1)				Prepared: 01/07/2013 Analyzed: 01/09/2013						
Aluminum	5.00	U	5.00	mg/kg wet						
Antimony	0.600	U	0.600	mg/kg wet						
Arsenic	1.00	U	1.00	mg/kg wet						
Barium	0.500	U	0.500	mg/kg wet						
Beryllium	0.200	U	0.200	mg/kg wet						
Boron	2.00	U	2.00	mg/kg wet						
Cadmium	0.200	U	0.200	mg/kg wet						
Calcium	100	U	100	mg/kg wet						
Chromium	0.200	U	0.200	mg/kg wet						
Cobalt	2.00	U	2.00	mg/kg wet						
Copper	1.00	U	1.00	mg/kg wet						
Iron	20.0	U	20.0	mg/kg wet						
Lead	0.500	U	0.500	mg/kg wet						
Magnesium	3.06	B	75.0	mg/kg wet						
Manganese	5.00	U	5.00	mg/kg wet						
Molybdenum	2.00	U	2.00	mg/kg wet						
Nickel	4.00	U	4.00	mg/kg wet						
Potassium	400	U	400	mg/kg wet						
Selenium	0.300	U	0.300	mg/kg wet						
Silicon	2.00	U	2.00	mg/kg wet						
Silver	0.200	U	0.200	mg/kg wet						
Sodium	50.0	U	50.0	mg/kg wet						
Vanadium	2.50	U	2.50	mg/kg wet						
Zinc	10.0	U	10.0	mg/kg wet						
Duplicate (L301032-DUP1)		**Source: 1301010-01**		Prepared: 01/07/2013 Analyzed: 01/09/2013						
Aluminum	9630		14.8	mg/kg dry		9030			6	20
Antimony	1.78	U	1.78	mg/kg dry		1.69 U				20
Arsenic	2.79	B	2.97	mg/kg dry		2.61			7	20
Barium	70.1		1.48	mg/kg dry		63.3			10	20
Beryllium	0.342	B	0.594	mg/kg dry		0.336			2	20
Boron	1.86	B	5.94	mg/kg dry		1.70			9	20
Cadmium	0.594	U	0.594	mg/kg dry		0.564 U				20
Calcium	4220		297	mg/kg dry		4510			7	20
Chromium	12.4		0.594	mg/kg dry		10.8			14	20
Cobalt	7.32		5.94	mg/kg dry		6.80			7	20
Copper	15.9		2.97	mg/kg dry		14.8			7	20

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

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 L301032 - SW 3050B										
Duplicate (L301032-DUP1)		**Source: 1301010-01**		Prepared: 01/07/2013 Analyzed: 01/09/2013						
Iron	21400		59.4	mg/kg dry		21100			2	20
Lead	4.69		1.48	mg/kg dry		4.34			8	20
Magnesium	3920		223	mg/kg dry		3840			2	20
Manganese	323		14.8	mg/kg dry		318			1	20
Molybdenum	5.94	U	5.94	mg/kg dry		5.64 U				20
Nickel	11.6	B	11.9	mg/kg dry		12.5			7	20
Potassium	3830		1190	mg/kg dry		3650			5	20
Selenium	0.891	U	0.891	mg/kg dry		0.845 U				20
Silicon	472		5.94	mg/kg dry		312			41*	20
Silver	0.594	U	0.594	mg/kg dry		0.564 U				20
Sodium	278		148	mg/kg dry		291			5	20
Vanadium	52.3		7.42	mg/kg dry		52.8			0.8	20
Zinc	119		29.7	mg/kg dry		109			8	20
Matrix Spike (L301032-MS1)		**Source: 1301010-01**		Prepared: 01/07/2013 Analyzed: 01/09/2013						
Aluminum	11200		13.4	mg/kg dry	178.77	9030	1190*	75-125		
Antimony	14.9		1.61	mg/kg dry	44.693	1.69 U	33*	75-125		
Arsenic	166		2.68	mg/kg dry	178.77	2.61	91	75-125		
Barium	243		1.34	mg/kg dry	178.77	63.3	101	75-125		
Beryllium	4.57		0.536	mg/kg dry	4.4693	0.336	95	75-125		
Boron	84.0		5.36	mg/kg dry	89.385	1.70	92	75-125		
Cadmium	4.84		0.536	mg/kg dry	4.4693	0.564 U	108	75-125		
Calcium	7060		268	mg/kg dry	2234.6	4510	114	75-125		
Chromium	27.8		0.536	mg/kg dry	17.877	10.8	95	75-125		
Cobalt	48.9		5.36	mg/kg dry	44.693	6.80	94	75-125		
Copper	36.6		2.68	mg/kg dry	22.346	14.8	97	75-125		
Iron	21300		53.6	mg/kg dry	89.385	21100	190*	75-125		
Lead	44.6		1.34	mg/kg dry	44.693	4.34	90	75-125		
Magnesium	6180		201	mg/kg dry	2234.6	3840	105	75-125		
Manganese	367		13.4	mg/kg dry	44.693	318	109	75-125		
Molybdenum	81.6		5.36	mg/kg dry	89.385	5.64 U	91	75-125		
Nickel	52.9		10.7	mg/kg dry	44.693	12.5	90	75-125		
Potassium	5930		1070	mg/kg dry	2234.6	3650	102	75-125		
Selenium	163		0.804	mg/kg dry	178.77	0.845 U	91	75-125		
Silicon	547		5.36	mg/kg dry	89.385	312	263*	75-125		
Silver	3.87		0.536	mg/kg dry	4.4693	0.564 U	87	75-125		
Sodium	2540		134	mg/kg dry	2234.6	291	101	75-125		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

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 L301032 - SW 3050B									
Matrix Spike (L301032-MS1)		**Source: 1301010-01**	Prepared: 01/07/2013 Analyzed: 01/09/2013						
Vanadium	92.4	6.70	mg/kg dry	44.693	52.8	89	75-125		
Zinc	194	26.8	mg/kg dry	44.693	109	188*	75-125		
Post Spike (L301032-PS1)		**Source: 1301010-01**	Prepared: 01/07/2013 Analyzed: 01/09/2013						
Aluminum	157000		ug/L	66000	96100	92	75-125		
Antimony	312		ug/L	300.00	3.70	103	75-125		
Iron	338000		ug/L	128000	225000	88	75-125		
Silicon	6870		ug/L	3300.0	3320	108	75-125		
Zinc	1490		ug/L	300.00	1160	108	75-125		
Reference (L301032-SRM1)			Prepared: 01/07/2013 Analyzed: 01/09/2013						
Aluminum	10800	14.4	mg/kg wet	6670.0		162	0-200.89		
Antimony	49.2	1.73	mg/kg wet	53.000		93	0-235.8		
Arsenic	119	2.88	mg/kg wet	114.00		105	82.8-117.54		
Barium	312	1.44	mg/kg wet	307.00		102	79.8-120.2		
Beryllium	112	0.577	mg/kg wet	108.00		103	82.8-117.6		
Boron	84.9	5.77	mg/kg wet	85.100		100	67.5-132.8		
Cadmium	236	0.577	mg/kg wet	225.00		105	83.6-116.4		
Calcium	3410	288	mg/kg wet	3360.0		101	83.3-116.9		
Chromium	81.9	0.577	mg/kg wet	77.200		106	73.3-126.4		
Cobalt	169	5.77	mg/kg wet	166.00		102	80.7-118.7		
Copper	274	2.88	mg/kg wet	271.00		101	80.8-119.2		
Iron	8730	57.7	mg/kg wet	8420.0		104	78.6-121.1		
Lead	191	1.44	mg/kg wet	190.00		101	81.6-118.4		
Magnesium	8690	216	mg/kg wet	8570.0		101	83.2-116.7		
Manganese	903	14.4	mg/kg wet	965.00		94	69.3-130.5		
Molybdenum	246	5.77	mg/kg wet	235.00		105	76.2-123.8		
Nickel	228	11.5	mg/kg wet	221.00		103	79.6-120.8		
Potassium	14800	1150	mg/kg wet	14400		103	81.9-118.1		
Selenium	193	0.865	mg/kg wet	187.00		103	75.9-124.6		
Silicon	391	5.77	mg/kg wet	807.00		48	0-219.3		
Silver	84.1	0.577	mg/kg wet	83.500		101	82.7-117.1		
Sodium	9570	144	mg/kg wet	9730.0		98	82.5-117.2		
Vanadium	107	7.21	mg/kg wet	98.700		108	75.9-123.6		
Zinc	208	28.8	mg/kg wet	199.00		105	78.4-121.6		

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0172	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/10/2013 09:09

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 L301036 - SW 7471A Prep										
Blank (L301036-BLK1)				Prepared: 01/07/2013 Analyzed: 01/08/2013						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L301036-DUP1)		**Source: 1301010-01**		Prepared: 01/07/2013 Analyzed: 01/08/2013						
Mercury	1.51		0.0554	mg/kg dry		1.48			1.80	20
Matrix Spike (L301036-MS1)		**Source: 1301010-01**		Prepared: 01/07/2013 Analyzed: 01/08/2013						
Mercury	1.78		0.0539	mg/kg dry	0.14978	1.48	199*	75-125		20
Reference (L301036-SRM1)				Prepared: 01/07/2013 Analyzed: 01/08/2013						
Mercury	1.34		0.0290	mg/kg wet	1.2900		104	62.6-138		

Lionville Laboratory

Logbook #: 1194

SAMPLE DIGESTION RECORD

Digestion Batch #: L301032
Date/Time Initiated: 1/7/13 1300
Date/Time Completed: 1/8/13 1745
Analyst: [illegible]
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 3 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1301010-01		0.59	50		TO	fine	brown soil	rocks, sticks	
L301032-DUP1		0.56	50						
MS1	0.5	0.62	50						
BLK1		0.50	50			coarse	boiling dry	N/A	
SRM1		0.52	50			fine	pink sandy		

[illegible] 1/7/13

Spiking IDs / Expiration Date:
MS#: 1201581

LCS#: 1201014

Reagent IDs:
HNO_3 0000003590
HCl L13079
H_2O_2 L11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date: [illegible] 1/9/13

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Signed\SPI\Metals Digestion log.doc

Page #:

PREPARATION BENCH SHEET

L301032

Lionville Laboratory

Printed: 1/9/2013 9:14:08AM

000000017

Matrix: Solid **Prepared using: METALS - SW 3050B** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1301010-01	6010B ICP Trace	01/07/2013 13:00	0.59	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
L301032-BLK1	QC	01/07/2013 13:00	0.5	50						
L301032-DUP1	QC	01/07/2013 13:00	0.56	50		1301010-01				
L301032-MS1	QC	01/07/2013 13:00	0.62	50	1201581	1301010-01	500			
L301032-PS1	QC	01/07/2013 13:00	0.59	50	1201582	1301010-01	100			
L301032-SRM1	QC	01/07/2013 13:00	0.52	50	1201014		520			

Extracts Relinquished By — Date: 1/9/13

Extracts Received By — Date: 01/09/13

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1198

Analyst: [illegible]
Date 1/7/13
Start Time/Temp: 2050/97°
End Time/Temp: 2125/95°

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

Prep Batch: L301036
Worksheet: HG010802
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		10 ml	50	
1.0 µg/l		0.500		10ml	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		10ml	50	
ICV		0.125	2.5	10 ml	50	
CCV		0.250	5.0	10 ml	50	
ICB/CCB				10 ml	50	
L301036-BLK1				0.31	50	
SRM1				0.31	50	
L301010-07				0.38	50	
L301036-DUP1				0.36	50	
MS1		0.500	1.0	0.37	50	
L301014-01				0.32	50	
L301036-DUP2				0.39	50	
MS2		0.500	1.0	0.37	50	
L301014-02				0.38	50	
03				0.38	50	
04				0.35	50	
05				0.37	50	
06				0.38	50	
07				0.37	50	
08				0.36	50	
09				0.35	50	
10				0.35	50	
11				0.34	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	1/7/13 1210
ICV/CCV/LCS	(I.V. 1201411)	N/A

Reviewed By/Date: [illegible] 1/9/13

se book # 1198 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 #:

000000018

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1198

Analyst: Mikell
Date 1/7/13
Start Time/Temp: See pg 08
End Time/Temp:

Instrument ID: HG32
Balance # B14 /NA
Pipette Calibration (Daily) (Y)

Prep Batch: L301036
Worksheet: HG010802
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.
1301014-12				0.34	50	

MM 1/7/13

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

Reviewed By/Date: 1/9/13

se book # 1198 for std traceability information

Soil LCS True Value = See pg 08 mg/Kg
Standard # _____

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