SAF-RC-149
300 Area D4 Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 6/25/12
INITIAL/DATE

COMMENTS:

SDG KP0104 SAF-RC-149

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 300-284, Garnet Sand Blasting Site

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

8 June 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 #	1206010
SDG #	KP0104
SAF #	RC-149
Date Received	06/06/12
# Samples	4
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

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 30 pages.

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

CHAIN OF CUSTODY

REVISION

Lionville Laboratory Use Only: 1206010

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-149
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: STD TAT: 7 Day

Date Rec'd: 6-6-12 Date Due: 6-13-12

Refrigerator #		A		B		C
#/Type Container	Liquid	2		2		2
	Solid	1AG		1AG		1AG
Volume	Liquid					
	Solid	60		120		60
Preservatives		—		—		—
ANALYSES REQUESTED		ORGANIC: VOA, BNA, Pest/PCB, Herb		INORG: Metal, Hg, CN		TCLP Met, TCLP Hg, pH

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: Metal		TCLP RCRA		pH
01	T1PP84			Soil	5-31-12	1115	X		X	X	X
02	T1PP85					1128	X		X	X	X
03	T1PP86					1136	X		X	X	X
04	T1PP87					1149	X		X	X	X

Special Instructions: Run matrix QC

Met ① = HSL + B, Li, Mo, Si, U, Zr

Special Instructions:
1. Leach and Hold TCLP metals
2. 6/14/12 Leachates cancelled per client
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	V. Hernandez	6/6/12	0930

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-149-092	Page 1 of ~~2~~ 1

Collector M. Simonds	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH
Price Code ~~8L~~ AJ 6-4-12 2D	**Data Turnaround** ~~21~~ 7 Days 5/31/12		
Project Designation 300 Area D4 Waste Sites - Soil In-Process	**Sampling Location** 300-284, Garnet Sand Blasting Site		**SAF No.** RC-149
Ice Chest No. RCC-07-002	**Field Logbook No.** EL-1663-02	**COA** 0302842000	**Method of Shipment** FedEx/Hand Deliever
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE 5/31/12	**Offsite Property No.** A110361		**Bill of Lading/Air Bill No.** See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potential~~ Radioactive < Dot limits 6-4-12 cmB

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	None	None	None	None	None	None	None	None	None	None
Type of Container	G/P	aG	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1	1
Volume	60mL	120mL	60mL	500mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	pH - 9045	See item (3) in Special Instructions.	Gross Alpha & Gross Beta	Isotopic Uranium	Isotopic Plutonium	Americium-241	Strontium-89,90 -- Total Sr	Technetium-99 RCF	

Sample No.	Matrix *	Sample Date	Sample Time										
J1PP84	SOIL	5/31/12	1115	✓	✓	✓							33303
J1PP85	SOIL	5/31/12	1128	✓	✓	✓							33304
J1PP86	SOIL	5/31/12	1136	✓	✓	✓							33305
J1PP87	SOIL	5/31/12	1149	✓	✓	✓							33306

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS	5/31/12 1345	DAVID BECKER	5/31/12 1345
DAVID BECKER	5/31/12 1505	Birchan	1060#2 5-31-12 1505
Birchan	1060#2 6-4-12 1050	Fed Ex	
Fed Ex	6-6-12 0930	VICTOR HERNANDEZ	6-6-12 0930

SPECIAL INSTRUCTIONS
Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further direction is provided.

(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)
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470
(3) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65}

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

KP0104

REVIEWED BY AJ DATE 6-4-12

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

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford Date: 6/1/12

Project/SAP/SOW/Release #: RC-149

LvL Batch #: 1206010 Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7984 6833 5590
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°	°C	Cooler # RCC-07-002
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

METALS

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PP84	1206010-01	Soil	05/31/2012 11:15	06/06/2012 09:30
J1PP85	1206010-02	Soil	05/31/2012 11:28	06/06/2012 09:30
J1PP86	1206010-03	Soil	05/31/2012 11:36	06/06/2012 09:30
J1PP87	1206010-04	Soil	05/31/2012 11:49	06/06/2012 09:30

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

Case Narrative

Client: WC-HANFORD RC-149
LVL#: 1206010
SDG/SAF#: KP0104/RC-149

W.O.#: 60049-001-001-0001-00
Date Received: 06-06-12

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 soil samples.

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

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. The preparation/method blanks were within method criteria. {less than the Limit of Quantitation, samples 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 with the exception of Magnesium at 81.6% (83.2-116.7% range). The sample result for Magnesium may be slightly biased low. There is no Uranium or Zirconium result for reference sample L206043-SRM1 due to the standard reference material does not contain Uranium or Zirconium. The soil samples were reported for Uranium and Zirconium as per the project manager

10. The matrix spike (MS) recoveries for 18 analytes were outside the 75-125% control limits.

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

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PP84	Aluminum	24,000	119.6
	Antimony	100	90.5
	Arsenic	100	95.6
	Beryllium	100	91.8
	Boron	100	93.6
	Cadmium	100	92.7
	Chromium	100	145.7
	Cobalt	100	98.6
	Iron	44,000	139.7
	Lead	100	105.1
	Manganese	500	99.2
	Molybdenum	100	93.0
	Nickel	100	118.4
	Selenium	100	88.5
	Silicon	2,100	134.0
	Silver	100	85.1
	Uranium	1,000	81.5
	Zirconium	1,000	86.6

12. The duplicate analyses for 6 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 Arsenic, Beryllium, Boron, Cadmium, and Molybdenum 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

6/20/12
Date

alm/06-010stc

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

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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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264 Welsh Pool Road
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-149 Project Number: KP0104 Project Manager: Joan Kessner	**Reported:** 06/12/2012 10:22

J1PP84
1206010-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**2930**		4.37	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Antimony	0.525	U	0.525	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Arsenic	**1.13**		0.875	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Barium	**33.2**		0.437	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Beryllium	**0.118**	B	0.175	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Boron	**2.11**		1.75	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cadmium	**0.0981**	B	0.175	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Calcium	**2860**		87.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Chromium	**16.0**		0.175	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cobalt	**3.21**		1.75	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Copper	**8.53**		0.875	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Iron	**10500**		17.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lead	**6.85**		0.437	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lithium	**3.20**		2.19	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Magnesium	**1860**		65.6	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Manganese	**151**		4.37	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Molybdenum	**0.489**	B	1.75	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Nickel	**9.61**		3.50	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Potassium	**498**		350	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Selenium	0.262	U	0.262	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silicon	**202**		1.75	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silver	0.175	U	0.175	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Sodium	**197**		43.7	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Uranium	17.5	U	17.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Vanadium	**30.3**		2.19	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zinc	**37.4**		8.75	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zirconium	**10.5**		2.19	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Mercury	0.0265	U	0.0265	mg/kg dry	1	L206050	06/07/2012	06/08/2012	7471A

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

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

J1PP85
1206010-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**3690**		3.89	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Antimony	0.466	U	0.466	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Arsenic	**1.41**		0.777	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Barium	**34.1**		0.389	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Beryllium	**0.127**	B	0.155	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Boron	**1.97**		1.55	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cadmium	**0.305**		0.155	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Calcium	**2780**		77.7	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Chromium	**7.99**		0.155	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cobalt	**5.84**		1.55	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Copper	**18.4**		0.777	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Iron	**10900**		15.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lead	**11.3**		0.389	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lithium	**2.39**		1.94	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Magnesium	**1900**		58.3	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Manganese	**146**		3.89	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Molybdenum	**0.810**	B	1.55	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Nickel	**26.1**		3.11	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Potassium	**466**		311	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Selenium	0.233	U	0.233	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silicon	**174**		1.55	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silver	0.155	U	0.155	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Sodium	**317**		38.9	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Uranium	15.5	U	15.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Vanadium	**24.0**		1.94	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zinc	**136**		7.77	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zirconium	**11.6**		1.94	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Mercury	0.0292	U	0.0292	mg/kg dry	1	L206050	06/07/2012	06/08/2012	7471A

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-149 Project Number: KP0104 Project Manager: Joan Kessner	**Reported:** 06/12/2012 10:22

J1PP86
1206010-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	**2950**		3.84	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Antimony	0.460	U	0.460	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Arsenic	**1.59**		0.767	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Barium	**34.3**		0.384	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Beryllium	**0.131**	B	0.153	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Boron	**2.46**		1.53	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cadmium	**0.378**		0.153	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Calcium	**2190**		76.7	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Chromium	**9.00**		0.153	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cobalt	**2.86**		1.53	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Copper	**9.09**		0.767	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Iron	**9900**		15.3	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lead	**13.6**		0.384	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lithium	**2.87**		1.92	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Magnesium	**1750**		57.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Manganese	**142**		3.84	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Molybdenum	**0.448**	B	1.53	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Nickel	**9.84**		3.07	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Potassium	**503**		307	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Selenium	0.230	U	0.230	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silicon	**183**		1.53	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silver	0.153	U	0.153	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Sodium	**138**		38.4	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Uranium	15.3	U	15.3	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Vanadium	**26.0**		1.92	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zinc	**87.1**		7.67	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zirconium	**10.4**		1.92	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Mercury	**0.00893**	B	0.0243	mg/kg dry	1	L206050	06/07/2012	06/08/2012	7471A

LIONVILLE LABORATORY
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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-149 Project Number: KP0104 Project Manager: Joan Kessner	**Reported:** 06/12/2012 10:22

J1PP87
1206010-04 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**4580**		3.68	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Antimony	0.441	U	0.441	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Arsenic	**2.11**		0.735	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Barium	**60.2**		0.368	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Beryllium	**0.187**		0.147	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Boron	**3.56**		1.47	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cadmium	**0.134**	B	0.147	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Calcium	**3530**		73.5	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Chromium	**7.17**		0.147	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Cobalt	**4.17**		1.47	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Copper	**10.3**		0.735	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Iron	**12800**		14.7	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lead	**11.0**		0.368	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Lithium	**4.09**		1.84	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Magnesium	**2710**		55.1	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Manganese	**205**		3.68	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Molybdenum	**0.315**	B	1.47	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Nickel	**9.33**		2.94	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Potassium	**817**		294	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Selenium	0.221	U	0.221	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silicon	**189**		1.47	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Silver	0.147	U	0.147	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Sodium	**218**		36.8	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Uranium	14.7	U	14.7	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Vanadium	**35.5**		1.84	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zinc	**61.5**		7.35	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Zirconium	**13.9**		1.84	mg/kg dry	1	L206043	06/06/2012	06/07/2012	6010B
Mercury	**0.0270**	B	0.0276	mg/kg dry	1	L206050	06/07/2012	06/08/2012	7471A

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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 L206043 - SW 3050B										
Blank (L206043-BLK1)				Prepared: 06/06/2012 Analyzed: 06/07/2012						
Aluminum	3.68	U	3.68	mg/kg wet						
Antimony	0.441	U	0.441	mg/kg wet						
Arsenic	0.735	U	0.735	mg/kg wet						
Barium	0.368	U	0.368	mg/kg wet						
Beryllium	0.147	U	0.147	mg/kg wet						
Boron	1.47	U	1.47	mg/kg wet						
Cadmium	0.147	U	0.147	mg/kg wet						
Calcium	5.72	B	73.5	mg/kg wet						
Chromium	0.147	U	0.147	mg/kg wet						
Cobalt	1.47	U	1.47	mg/kg wet						
Copper	0.735	U	0.735	mg/kg wet						
Iron	14.7	U	14.7	mg/kg wet						
Lead	0.368	U	0.368	mg/kg wet						
Lithium	1.84	U	1.84	mg/kg wet						
Magnesium	55.1	U	55.1	mg/kg wet						
Manganese	3.68	U	3.68	mg/kg wet						
Molybdenum	1.47	U	1.47	mg/kg wet						
Nickel	2.94	U	2.94	mg/kg wet						
Potassium	294	U	294	mg/kg wet						
Selenium	0.221	U	0.221	mg/kg wet						
Silicon	1.47	U	1.47	mg/kg wet						
Silver	0.147	U	0.147	mg/kg wet						
Sodium	36.8	U	36.8	mg/kg wet						
Uranium	14.7	U	14.7	mg/kg wet						
Vanadium	1.84	U	1.84	mg/kg wet						
Zinc	7.35	U	7.35	mg/kg wet						
Zirconium	0.181	B	1.84	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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 L206043 - SW 3050B										
Duplicate (L206043-DUP1)		**Source: 1206010-01**		Prepared: 06/06/2012 Analyzed: 06/07/2012						
Aluminum	3620		4.30	mg/kg dry		2930			21.2*	20
Antimony	0.516	U	0.516	mg/kg dry		0.525 U				20
Arsenic	1.42		0.860	mg/kg dry		1.13			22.8*	20
Barium	55.0		0.430	mg/kg dry		33.2			49.6*	20
Beryllium	0.153	B	0.172	mg/kg dry		0.118			25.8*	20
Boron	3.08		1.72	mg/kg dry		2.11			37.4*	20
Cadmium	0.126	B	0.172	mg/kg dry		0.0981			24.8*	20
Calcium	3260		86.0	mg/kg dry		2860			13.2	20
Chromium	7.75		0.172	mg/kg dry		16.0			69.7*	20
Cobalt	3.41		1.72	mg/kg dry		3.21			5.81	20
Copper	8.77		0.860	mg/kg dry		8.53			2.85	20
Iron	11900		17.2	mg/kg dry		10500			12.3	20
Lead	8.19		0.430	mg/kg dry		6.85			17.8	20
Lithium	3.73		2.15	mg/kg dry		3.20			15.2	20
Magnesium	2140		64.5	mg/kg dry		1860			14.0	20
Manganese	169		4.30	mg/kg dry		151			11.4	20
Molybdenum	0.368	B	1.72	mg/kg dry		0.489			28.2*	20
Nickel	6.24		3.44	mg/kg dry		9.61			42.5*	20
Potassium	650		344	mg/kg dry		498			26.4*	20
Selenium	0.258	U	0.258	mg/kg dry		0.262 U				20
Silicon	220		1.72	mg/kg dry		202			8.53	20
Silver	0.172	U	0.172	mg/kg dry		0.175 U				20
Sodium	237		43.0	mg/kg dry		197			18.3	20
Uranium	17.2	U	17.2	mg/kg dry		17.5 U				20
Vanadium	33.3		2.15	mg/kg dry		30.3			9.48	20
Zinc	48.8		8.60	mg/kg dry		37.4			26.4*	20
Zirconium	12.3		2.15	mg/kg dry		10.5			16.1	20

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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 L206043 - SW 3050B									
Matrix Spike (L206043-MS1)		**Source: 1206010-01**	Prepared: 06/06/2012 Analyzed: 06/07/2012						
Aluminum	4420	3.58	mg/kg dry	143.37	2930	1040*	75-125		
Antimony	13.1	0.430	mg/kg dry	35.842	0.525 U	36.7*	75-125		
Arsenic	104	0.717	mg/kg dry	143.37	1.13	71.5*	75-125		
Barium	154	0.358	mg/kg dry	143.37	33.2	84.3	75-125		
Beryllium	2.62	0.143	mg/kg dry	3.5842	0.118	69.8*	75-125		
Boron	49.7	1.43	mg/kg dry	71.684	2.11	66.3*	75-125		
Cadmium	2.47	0.143	mg/kg dry	3.5842	0.0981	66.2*	75-125		
Calcium	4910	71.7	mg/kg dry	1792.1	2860	114	75-125		
Chromium	20.0	0.143	mg/kg dry	14.337	16.0	27.7*	75-125		
Cobalt	27.6	1.43	mg/kg dry	35.842	3.21	68.1*	75-125		
Copper	22.0	0.717	mg/kg dry	17.921	8.53	75.1	75-125		
Iron	12300	14.3	mg/kg dry	71.684	10500	2470*	75-125		
Lead	30.1	0.358	mg/kg dry	35.842	6.85	64.8*	75-125		
Lithium	57.4	1.79	mg/kg dry	71.684	3.20	75.6	75-125		
Magnesium	3540	53.8	mg/kg dry	1792.1	1860	93.8	75-125		
Manganese	213	3.58	mg/kg dry	35.842	151	171*	75-125		
Molybdenum	50.6	1.43	mg/kg dry	71.684	0.489	70.0*	75-125		
Nickel	31.0	2.87	mg/kg dry	35.842	9.61	59.6*	75-125		
Potassium	1910	287	mg/kg dry	1792.1	498	79.0	75-125		
Selenium	97.7	0.215	mg/kg dry	143.37	0.262 U	68.1*	75-125		
Silicon	325	1.43	mg/kg dry	71.684	202	172*	75-125		
Silver	2.10	0.143	mg/kg dry	3.5842	0.175 U	58.7*	75-125		
Sodium	1620	35.8	mg/kg dry	1792.1	197	79.2	75-125		
Uranium	247	14.3	mg/kg dry	358.42	17.5 U	68.9*	75-125		
Vanadium	62.2	1.79	mg/kg dry	35.842	30.3	89.0	75-125		
Zinc	73.2	7.17	mg/kg dry	35.842	37.4	99.9	75-125		
Zirconium	262	1.79	mg/kg dry	358.42	10.5	70.1*	75-125		

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

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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 L206043 - SW 3050B									
Reference (L206043-SRM1)				Prepared: 06/06/2012 Analyzed: 06/07/2012					
Aluminum	7680	12.5	mg/kg wet	6670.0		115	0-200.89		
Antimony	37.7	1.50	mg/kg wet	53.000		71.2	0-235.8		
Arsenic	104	2.50	mg/kg wet	114.00		91.4	82.8-117.54		
Barium	274	1.25	mg/kg wet	307.00		89.2	79.8-120.2		
Beryllium	94.7	0.500	mg/kg wet	108.00		87.7	82.8-117.6		
Boron	72.1	5.00	mg/kg wet	85.100		84.8	67.5-132.8		
Cadmium	203	0.500	mg/kg wet	225.00		90.3	83.6-116.4		
Calcium	2900	250	mg/kg wet	3360.0		86.5	83.3-116.9		
Chromium	71.8	0.500	mg/kg wet	77.200		93.0	73.3-126.4		
Cobalt	146	5.00	mg/kg wet	166.00		88.2	80.7-118.7		
Copper	242	2.50	mg/kg wet	271.00		89.5	80.8-119.2		
Iron	7440	50.0	mg/kg wet	8420.0		88.4	78.6-121.1		
Lead	166	1.25	mg/kg wet	190.00		87.3	81.6-118.4		
Lithium	108	6.25	mg/kg wet	114.00		94.8	50.9-148.2		
Magnesium	6990	188	mg/kg wet	8570.0		81.6*	83.2-116.7		
Manganese	818	12.5	mg/kg wet	965.00		84.7	69.3-130.5		
Molybdenum	213	5.00	mg/kg wet	235.00		90.5	76.2-123.8		
Nickel	198	10.0	mg/kg wet	221.00		89.6	79.6-120.8		
Potassium	13000	1000	mg/kg wet	14400		90.6	81.9-118.1		
Selenium	168	0.750	mg/kg wet	187.00		90.0	75.9-124.6		
Silicon	390	5.00	mg/kg wet	807.00		48.3	0-219.3		
Silver	76.7	0.500	mg/kg wet	83.500		91.8	82.7-117.1		
Sodium	8130	125	mg/kg wet	9730.0		83.6	82.5-117.2		
Vanadium	93.8	6.25	mg/kg wet	98.700		95.0	75.9-123.6		
Zinc	186	25.0	mg/kg wet	199.00		93.4	78.4-121.6		
Batch L206050 - SW 7471A Prep									
Blank (L206050-BLK1)				Prepared: 06/07/2012 Analyzed: 06/08/2012					
Mercury	0.0300 U	0.0300	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/12/2012 10:22

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 L206050 - SW 7471A Prep										
Duplicate (L206050-DUP3)		**Source: 1206010-01**		Prepared: 06/07/2012 Analyzed: 06/08/2012						
Mercury	0.0238	U	0.0238	mg/kg dry		0.0265 U				20
Matrix Spike (L206050-MS3)		**Source: 1206010-01**		Prepared: 06/07/2012 Analyzed: 06/08/2012						
Mercury	0.163		0.0251	mg/kg dry	0.13949	0.0265 U	117	75-125		20
Reference (L206050-SRM1)				Prepared: 06/07/2012 Analyzed: 06/08/2012						
Mercury	1.26		0.0290	mg/kg wet	1.2900		97.9	62.6-138		

Lionville Laboratory Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L206093
Date/Time Initiated: 6/6/12 1340
Date/Time Completed: 6/6/12 1910
Analyst: JJ
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 #: B14
Balance Cal Verification: Y NA
Temp: 95
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
1206010-01		0.59	50		TO	med	Brown	Rocks/H2O	N/A
L206043-Rp1		0.60	50						
* -MS1	0.5	0.72	50						
1206010-02		0.69	50			Fine	Brown		
-03		0.67	50			Fine	Brown	Rocks	
-04		0.75	50			Fine	Brown	Rocks	
L206043-BLK1		0.68	50			Coarse	Boiling chips		
-SRM1		0.60	50			Fine	pink sand		

JJS
6/6/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: 1101357

Reagent IDs:
HNO_3 K44023
HCl L01031
H_2O_2 K09A03
1:1 HNO_3 677-66-02
1:1 HCl

File ID#:

Data Review By/Date: [signature] 6/7/12

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

6072-091-16 2 same
1 1 12 1

Page #:

7

000000021

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 6/7/12
Start Time/Temp: 2035/94°
End Time/Temp: 2110/97°

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

Logbook # 1123
Prep Batch: L206050
Worksheet: H6060802
SOP No. ME-HgCVAA
BLOCK 1 2 (3) (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10ml	50	
0.2 ug/l		0.100		10ml	50	
1.0 ug/l		0.500		10ml	50	
2.0 ug/l		1.000		10ml	50	
5.0 ug/l		2.500		10ml	50	
10.0 ug/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L206050-BLK1				0.30	50	
SRM1		⊗	⊗	0.31	50	
1206003-01				0.33	50	
L206050-DUP1				0.35	50	
MS1		0.500	1.0	0.34	50	
1206004-01				0.36	50	
L206050-DUP2				0.35	50	
MS2		0.500	1.0	0.37	50	
1206010-01				0.35	50	
L206050-DUP3				0.39	50	
MS3		0.500	1.0	0.37	50	
1206010-02				0.33	50	
03				0.38	50	
04				0.36	50	
1206011-01				0.34	50	
L206050-DUP4				0.36	50	
MS4		0.500	1.0	0.37	50	
1206012-01				0.33	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200585	6/7/12 1030
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 6/11/12

se book # 9368 for std traceability information

Soil LCS True Value = 1.24 mg/Kg
Standard # 1101357

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

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 6/7/12
Start Time/Temp: See page 024
End Time/Temp:

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

Logbook # 1173
Prep Batch: L206050
Worksheet: HG060802
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one) 3

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.
L206050-DUP5				0.37	50	
MS5		0.500	1.0	0.38	50	
1206013-01				0.36	50	
L206050-DUP6				0.37	50	
MS6		0.500	1.0	0.37	50	
1206013-02				0.39	50	

[illegible] 6/7/12

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

Reviewed By/Date: [illegible] 6/11/12

Soil LCS True Value = See page 024 mg/Kg
Standard # See page 024

se book # 9368 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
ater LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

PREPARATION BENCH SHEET

L206043

Lionville Laboratory

Printed: 6/20/2012 11:12:27AM

00000024

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
1206010-01	6010B HSL Metals	06/06/2012 13:30	0.59	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
1206010-02	6010B HSL Metals	06/06/2012 13:30	0.69	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
1206010-03	6010B HSL Metals	06/06/2012 13:30	0.67	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
1206010-04	6010B HSL Metals	06/06/2012 13:30	0.75	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
L206043-BLK1	QC	06/06/2012 13:30	0.68	50						
L206043-DUP1	QC	06/06/2012 13:30	0.6	50		1206010-01				
L206043-MS1	QC	06/06/2012 13:30	0.72	50	1200457	1206010-01	500			
L206043-SRM1	QC	06/06/2012 13:30	0.6	50	1101357		600			

JS 6/7/12
Extracts Relinquished By Date

Brooter 06/07/12
Extracts Received By Date

INORGANICS

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

WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/11/2012 14:14

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PP84	1206010-01	Soil	05/31/2012 11:15	06/06/2012 09:30
J1PP85	1206010-02	Soil	05/31/2012 11:28	06/06/2012 09:30
J1PP86	1206010-03	Soil	05/31/2012 11:36	06/06/2012 09:30
J1PP87	1206010-04	Soil	05/31/2012 11:49	06/06/2012 09:30

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A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-149 KP0104
LVL#: 1206010 **Date Received:** 06-06-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the data summary report. Results for soil or solid pH are measured in water at 25°C unless otherwise specified.

   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.

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy.

5. The Laboratory Control Sample (LCS) for pH was within the method criteria.

6. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

7. 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

6/13/12
Date

njp\i06-010

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 8 pages.

LIONVILLE LABORATORY
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-149 Project Number: KP0104 Project Manager: Joan Kessner	**Reported:** 06/11/2012 14:14

Notes and Definitions

*	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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Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PP84 (1206010-01) Soil								
%Solids	96.9	0.1	% by Weight	1	L206041	06/06/2012	06/06/2012	SM2540G
pH	8.53	0.10	pH Units	1	L206051	06/07/2012	06/07/2012	SW846 9045D
J1PP85 (1206010-02) Soil								
%Solids	93.3	0.1	% by Weight	1	L206041	06/06/2012	06/06/2012	SM2540G
pH	8.57	0.10	pH Units	1	L206051	06/07/2012	06/07/2012	SW846 9045D
J1PP86 (1206010-03) Soil								
%Solids	97.3	0.1	% by Weight	1	L206041	06/06/2012	06/06/2012	SM2540G
pH	8.86	0.10	pH Units	1	L206051	06/07/2012	06/07/2012	SW846 9045D
J1PP87 (1206010-04) Soil								
%Solids	90.7	0.1	% by Weight	1	L206041	06/06/2012	06/06/2012	SM2540G
pH	8.50	0.10	pH Units	1	L206051	06/07/2012	06/07/2012	SW846 9045D

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WC-Hanford, Inc.	Project: RC-149	
2620 Fermi Avenue	Project Number: KP0104	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/11/2012 14:14

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206041 - % Solids									
Duplicate (L206041-DUP1)		**Source: 1206010-01**	Prepared & Analyzed: 06/06/2012						
%Solids	97.1	0.1	% by Weight		96.9			0.3	20
Batch L206051 - Default Prep GenChem									
Duplicate (L206051-DUP1)		**Source: 1206010-01**	Prepared & Analyzed: 06/07/2012						
pH	8.54	0.10	pH Units		8.53			0.117	20
Reference (L206051-SRM1)			Prepared & Analyzed: 06/07/2012						
pH	9.99	0.10	pH Units	10.000		99.9	99-101		