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

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 8/28/12
INITIAL/DATE

COMMENTS:

SDG KP0119 **SAF-RC-150**

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: **323 Tank 3 – Tank Sediment/Sludge**

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

24 August 2012

RECEIVED
AUG 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 #	1208019
SDG #	KP0119
SAF #	RC-150
Date Received	08/07/12
# Samples	1
Matrix	OTHER SOLID
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 35 pages.

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

CHAIN OF CUSTODY

*Revision # 2

Lionville Laboratory Use Only: 1208019

Custody Transfer Record/Lab Work Request

Page 1 of 1

Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: WC Hanford SAF# RC-150 KP0119
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SW TAT: 7 Day

Date Rec'd: 8/7/12 Date Due: 8/14/12

Refrigerator #									A 1		B 2					
#/Type Container	Liquid															
	Solid								1AG		1AG					
Volume	Liquid															
	Solid								60		120					
Preservatives									—							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal Hg CN		TCLP met	TCLP Hg	IC Anions	TOC		
Lionville Laboratory Use Only									METO		TCLP Metals	Hg	Anions	TOC		

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
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	01	T1PX32	✓	✓	SL	8-2-12	0914							X		X	X	X	Analysis Stopped		

Special Instructions:
METO = HSLt B, Li, Mo, Si, U, Zr (NOTE)
RAD II

Special Instructions:
1. 8/15/12 TOC cancelled - matrix not amenable to the analysis
2. 8/16/12 TCLP metals added leachates for analyses per client;
3. due Thurs 8/23/12
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	8/7/12	1350

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

000000003

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-150-029	Page 1 of 1
Collector ~~M. Simonds~~ S. Clark per telecom w/ Dave Becker	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code ~~91~~ 9B (WDB 8/2/12); Data Turnaround 7 ~~21~~ Days (WDB 8/2/12)
Project Designation: 300 Area D4 Waste Sites - Other	Sampling Location: 323 TANK 3 - Tank Sediment/Sludge	SAF No.: RC-150	
Ice Chest No.: WCH-11-072	Field Logbook No.: EL-1663-03; COA: R323T32600	Method of Shipment: Fed Ex/Hand Deliver	
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE (WDB 8/2/12)	Offsite Property No.: NA	Bill of Lading/Air Bill No.: ~~See OSPC~~ AJ 8-6-12 See RSR	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive DOT LTD QTY

Special Handling and/or Storage

~~Cool 4C~~ NONE AJ 8-6-12 Cooling not maintained

Preservation	Cool 4C	None	Cool 4C	Cool 4C							
Type of Container	G/P	aG	G/P	aG	0						
No. of Container(s)	1	1			0						
Volume	60mL	120mL	60mL	60mL	0						
SAMPLE ANALYSIS	See item (1) in Special Instructions. *	See item (2) in Special Instructions.	IC Anions - 300.0	TOC - 415.1	RCF GHEA GHTRIPIN SCREEN	WDB 8/2/12					

Sample No.	Matrix *	Sample Date	Sample Time										
J1PX32	OTHER	8/2/12	0914	✓	✓	✓	✓	✓	34/24	Tray			
						8/2/12							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Steve Clark/Stephen A. Clark; Date/Time 8-2-12 10:40	Received By/Stored In: DAVID BECKER; Date/Time 8/2/12 1046
Relinquished By/Removed From: DAVID BECKER; Date/Time 8/2/12 1525	Received By/Stored In: Dennis Newman; Date/Time 8/2/12 1525
Relinquished By/Removed From: Dennis Newman; Date/Time 8/2/12 1530	Received By/Stored In: 1060#2 A. Freier; Date/Time 8-2-12 1530
Relinquished By/Removed From: WCH A. Freier; Date/Time 8-2-12 1550	Received By/Stored In: RCF; Date/Time 8-2-12 1550
Relinquished By/Removed From: RCF D. Miller; Date/Time 8-6-12 1035	Received By/Stored In: A. Freier; Date/Time 8-6-12 1035
Relinquished By/Removed From: WCH A. Freier; Date/Time 8-6-12 1105	Received By/Stored In: Fed Ex; Date/Time

SPECIAL INSTRUCTIONS

~~Please Note: Samples designated for TCLP Metals Analysis. Reach~~ and Hold until further direction is provided. (WDB 8/2/12)

(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}

(2) ~~Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium~~, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470 {Mercury} (WDB 8/2/12)

* Cooling not maintained on sample container AJ 8-6-12

Matrix *: S=Soil; SB=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

KP0119

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

REVIEWED BY RCF DATE 8-6-12

WCH-EE-011 Relinquished FedEx 8-7-12 1350 Received Victor Hernandez 8-7-12 @ 1350

000000004

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-150-029	Page 1 of 1

Collector ~~M. Simonds~~ S. Clark AJ 8-6-12	Company Contact Joan Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Project Designation 300 Area D4 Waste Sites - Other Per T2K-Com with Dave Becker	Sampling Location 323 TANK 3 - Tank Sediment/Sludge		SAF No. RC-150
Ice Chest No. WCH-11-072	Field Logbook No. EL-1663-03	COA R323T32600	Method of Shipment Fed Ex/Hand Deliver
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE	Offsite Property No. NA		Bill of Lading/Air Bill No. ~~See OSPC~~ See RSR

Price Code ~~9L~~ 9B

Data Turnaround 7 ~~21~~ Days

8/2/12 8/2/12

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive DOT LTD QTY AJ 8-6-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	Cool 4C	Cool 4C	AJ 8-6-12							
Type of Container	G/P	aG	G/P	aG								
No. of Container(s)	1	1	~~0~~ 1	~~0~~ 1								
Volume	~~60mL~~	120mL	~~60mL~~ 120ml	~~60mL~~ 120ml								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	IC Anions - 300.0	TOC - 415.1	RCF	34124						
Sample No.	Matrix *	Sample Date	Sample Time									
J1PX32	OTHER	8/2/12	0914	✓	✓	✓	✓					

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By/Removed From: Steve Clark/Stephen A. Clark	Received By/Stored In: DAVID BECKER	10:46 8-2-12 / 8/2/12 1046
Relinquished By/Removed From: DAVID BECKER	Received By/Stored In: Dennis Newman	8/2/12 1525 / 8/2/12 1525
Relinquished By/Removed From: Dennis Newman	Received By/Stored In: A. Freier (1060#2)	1530 / 8-2-12 1550
Relinquished By/Removed From: A. Freier (WCH 1060#2)	Received By/Stored In: Fed Ex	8-6-12 1105
Relinquished By/Removed From: Fed Ex	Received By/Stored In: VICTOR HERNANDEZ	8-7-12 1350 / 8-7-12 1350
Relinquished By/Removed From:	Received By/Stored In:	

SPECIAL INSTRUCTIONS

Please Note: 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) {Mercury}

(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470 {Mercury}

KP0119

REVIEWED BY JRE DATE 8-6-12

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

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

WCH-EE-011

000000005

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford Date: 8/7/12 @ 1550

Project/SAF/SOW/Release #: RC-150

LvL Batch #: 1208019 Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill #
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 3.7	°C	Cooler # WCH-11-072
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 NO2 NO3 OPO4 out of hold	
Short holds taken to wet lab?	☐ Yes 8/8/12	☐ 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 08/8/12
Person Contacted Gthason		Date 8/8/12	

SR-002-B.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: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PX32	1208019-01	Other Solid	08/02/2012 09:14	08/07/2012 13:50

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#: 1208019
SDG/SAF#: KP0119/RC-150

W.O.#: 60049-001-001-0001-00
Date Received: 08-07-12

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 1 other solid sample and 1 TCLP leachate sample.

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

   The leachate sample was analyzed and reported with a 5-fold dilution for ICP metals due to sample matrix.

   The other solid sample was analyzed and reported with a 12-fold dilution for ICP metals due to sample matrix and a high concentration of Uranium in the sample.

   The other solid sample was redigested and reanalyzed with a 12-fold dilution for Zirconium, and reported with the suffix "...RE1", due to low matrix spike recovery for Zirconium. The redigested matrix spike recovery for Zirconium was also low. The Zirconium result for sample J1PX32 could possibly be biased low due to sample matrix interference.

   The other solid sample was analyzed and reported with a 10-fold dilution for Mercury due to high concentration of analyte in sample.

   The low level standard in file ICP081512A was above the 50-150% control limit for Barium, however the Barium concentration for the low level QC sample CRL2 is below the RCRA limit for Barium. The leach blank L208139-BLK2 was the only sample reported from file ICP081512A for Barium. All sample results contained in this report were surrounded by QC within control.

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

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greater than ten times the MDL. The sample results for Copper, Nickel, and Zirconium were less than ten times the MDL.

13. All TCLP duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits.

14. The TCLP extract from sample J1PX32 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

    The matrix spike (MS) concentration for Mercury was equivalent to the regulatory level (200 ppb) as per SW846 method 1311. The required spike concentration is above the linear range of the instrument, resulting in a 50-fold dilution. The MS recovery was greater than 50% as per method criteria.

15. 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.

16. 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.

17. 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

8/23/12
Date

alm/08-019tclphgn%

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

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, MB value less than 5% of the RCRA limit, samples were greater than 20X MB value}.

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer. All laboratory control samples (LCS) were within the 80-120% control limits.

10. The other solid matrix spike (MS) recoveries for 13 analytes were outside the 75-125% control limits.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PX32	Aluminum	22,000	96.0
	Calcium	10,800	97.6
	Chromium	100	95.3
	Copper	100	120.1
	Iron	22,000	94.0
	Manganese	250	95.8
	Silicon	1,100	106.9
	Silver	100	113.6
	Uranium	4,000	88.5
	Zinc	100	124.3
	Zirconium	250	101.8
	Mercury	1	118.3
	ZirconiumRE1	500	109.6

12. The other solid duplicate analyses for 4 analyses were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

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-150	
2620 Fermi Avenue	Project Number: KP0119	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

J1PX32
1208019-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**53400**		56.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Antimony	6.79	U	6.79	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Arsenic	11.3	U	11.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Barium	**14.6**		5.66	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Beryllium	0.566	U	0.566	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Boron	22.6	U	22.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Cadmium	**1.85**	B	2.26	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Calcium	**7850**		1130	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Chromium	**596**		2.26	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Cobalt	**15.4**	B	22.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Copper	**76.4**		11.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Iron	**38900**		226	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Lead	**64.8**		5.66	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Lithium	28.3	U	28.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Magnesium	**1260**		849	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Manganese	**354**		56.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Molybdenum	22.6	U	22.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Nickel	**46.5**		45.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Potassium	**2800**	B	4530	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Selenium	11.3	U	11.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Silicon	**609**		22.6	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Silver	2.26	U	2.26	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Sodium	**909**		566	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Uranium	**71600**		226	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Vanadium	**7.72**	B	28.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Zinc	**80.6**	B	113	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Zirconium	**4.36**	B	28.3	mg/kg wet	12	L208064	08/09/2012	08/13/2012	6010B
Mercury	**5.42**		0.250	mg/kg wet	10	L208055	08/08/2012	08/09/2012	7471A

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

J1PX32
1208019-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Metals by SW846 1311 6000/7000 series									
Arsenic	0.0750	U	0.0750	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Barium	**0.0128**		0.00500	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Cadmium	**0.0116**	B	0.0150	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Chromium	**0.0324**		0.0250	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Lead	**0.0300**	B	0.0500	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Selenium	0.100	U	0.100	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Silver	0.0300	U	0.0300	mg/L	5	L208139	08/16/2012	08/17/2012	6010
Mercury	0.000200	U	0.000200	mg/L	1	L208171	08/20/2012	08/21/2012	7470

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

J1PX32

1208019-01RE1 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Zirconium	**8.95**	B	28.8	mg/kg wet	12	L208126	08/09/2012	08/17/2012	6010B

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/22/2012 12:20

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 L208055 - SW 7471A Prep										
Blank (L208055-BLK1)				Prepared: 08/08/2012 Analyzed: 08/09/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L208055-DUP4)		**Source: 1208019-01**		Prepared: 08/08/2012 Analyzed: 08/09/2012						
Mercury	5.50		0.290	mg/kg wet		5.42			1.53	20
Matrix Spike (L208055-MS4)		**Source: 1208019-01**		Prepared: 08/08/2012 Analyzed: 08/09/2012						
Mercury	9.56		0.257	mg/kg wet	0.14286	5.42	2900*	75-125		20
Reference (L208055-SRM1)				Prepared: 08/08/2012 Analyzed: 08/09/2012						
Mercury	1.29		0.0290	mg/kg wet	1.2900		100	62.6-138		
Batch L208064 - SW 3050B										
Blank (L208064-BLK1)				Prepared: 08/09/2012 Analyzed: 08/13/2012						
Aluminum	4.72	U	4.72	mg/kg wet						
Antimony	0.566	U	0.566	mg/kg wet						
Arsenic	0.943	U	0.943	mg/kg wet						
Barium	0.472	U	0.472	mg/kg wet						
Beryllium	0.0472	U	0.0472	mg/kg wet						
Boron	1.89	U	1.89	mg/kg wet						
Cadmium	0.189	U	0.189	mg/kg wet						
Calcium	9.35	B	94.3	mg/kg wet						
Chromium	0.189	U	0.189	mg/kg wet						
Cobalt	1.89	U	1.89	mg/kg wet						
Copper	0.943	U	0.943	mg/kg wet						
Iron	18.9	U	18.9	mg/kg wet						
Lead	0.472	U	0.472	mg/kg wet						
Lithium	2.36	U	2.36	mg/kg wet						
Magnesium	1.78	B	70.8	mg/kg wet						
Manganese	4.72	U	4.72	mg/kg wet						
Molybdenum	1.89	U	1.89	mg/kg wet						
Nickel	3.77	U	3.77	mg/kg wet						
Potassium	377	U	377	mg/kg wet						
Selenium	0.943	U	0.943	mg/kg wet						
Silicon	1.89	U	1.89	mg/kg wet						
Silver	0.189	U	0.189	mg/kg wet						
Sodium	47.2	U	47.2	mg/kg wet						
Uranium	18.9	U	18.9	mg/kg wet						
Vanadium	2.36	U	2.36	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

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 L208064 - SW 3050B										
Blank (L208064-BLK1)				Prepared: 08/09/2012 Analyzed: 08/13/2012						
Zinc	9.43	U	9.43	mg/kg wet						
Zirconium	0.234	B	2.36	mg/kg wet						
Duplicate (L208064-DUP5)		**Source: 1208019-01**		Prepared: 08/09/2012 Analyzed: 08/13/2012						
Aluminum	35900		57.7	mg/kg wet		53400			39.2*	20
Antimony	6.92	U	6.92	mg/kg wet		6.79 U				20
Arsenic	11.5	U	11.5	mg/kg wet		11.3 U				20
Barium	20.5		5.77	mg/kg wet		14.6			33.3*	20
Beryllium	0.577	U	0.577	mg/kg wet		0.566 U				20
Boron	23.1	U	23.1	mg/kg wet		22.6 U				20
Cadmium	1.77	B	2.31	mg/kg wet		1.85			4.43	20
Calcium	9340		1150	mg/kg wet		7850			17.4	20
Chromium	600		2.31	mg/kg wet		596			0.662	20
Cobalt	23.1	U	23.1	mg/kg wet		15.4				20
Copper	54.9		11.5	mg/kg wet		76.4			32.7*	20
Iron	37600		231	mg/kg wet		38900			3.33	20
Lead	49.4		5.77	mg/kg wet		64.8			27.0*	20
Lithium	28.8	U	28.8	mg/kg wet		28.3 U				20
Magnesium	1230		865	mg/kg wet		1260			2.40	20
Manganese	332		57.7	mg/kg wet		354			6.23	20
Molybdenum	23.1	U	23.1	mg/kg wet		22.6 U				20
Nickel	35.4	B	46.2	mg/kg wet		46.5			27.0*	20
Potassium	3290	B	4620	mg/kg wet		2800			16.2	20
Selenium	11.5	U	11.5	mg/kg wet		11.3 U				20
Silicon	472		23.1	mg/kg wet		609			25.3*	20
Silver	2.31	U	2.31	mg/kg wet		2.26 U				20
Sodium	861		577	mg/kg wet		909			5.43	20
Uranium	86900		231	mg/kg wet		71600			19.2	20
Vanadium	8.19	B	28.8	mg/kg wet		7.72			5.97	20
Zinc	74.6	B	115	mg/kg wet		80.6			7.67	20
Zirconium	5.71	B	28.8	mg/kg wet		4.36			26.7*	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/22/2012 12:20

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 L208064 - SW 3050B										
Matrix Spike (L208064-MS5)		**Source: 1208019-01**		Prepared: 08/09/2012 Analyzed: 08/13/2012						
Aluminum	45000		60.0	mg/kg wet	200.00	53400	-4220*	75-125		
Antimony	47.8		7.20	mg/kg wet	50.000	6.79 U	95.6	75-125		
Arsenic	210		12.0	mg/kg wet	200.00	11.3 U	105	75-125		
Barium	223		6.00	mg/kg wet	200.00	14.6	104	75-125		
Beryllium	5.10		0.600	mg/kg wet	5.0000	0.566 U	102	75-125		
Boron	106		24.0	mg/kg wet	100.00	22.6 U	106	75-125		
Cadmium	7.84		2.40	mg/kg wet	5.0000	1.85	120	75-125		
Calcium	12100		1200	mg/kg wet	2500.0	7850	169*	75-125		
Chromium	646		2.40	mg/kg wet	20.000	596	250*	75-125		
Cobalt	60.2		24.0	mg/kg wet	50.000	15.4	89.5	75-125		
Copper	88.0		12.0	mg/kg wet	25.000	76.4	46.2*	75-125		
Iron	38000		240	mg/kg wet	100.00	38900	-836*	75-125		
Lead	105		6.00	mg/kg wet	50.000	64.8	79.8	75-125		
Lithium	105		30.0	mg/kg wet	100.00	28.3 U	105	75-125		
Magnesium	3640		900	mg/kg wet	2500.0	1260	95.3	75-125		
Manganese	368		60.0	mg/kg wet	50.000	354	29.2*	75-125		
Molybdenum	105		24.0	mg/kg wet	100.00	22.6 U	105	75-125		
Nickel	86.2		48.0	mg/kg wet	50.000	46.5	79.4	75-125		
Potassium	5930		4800	mg/kg wet	2500.0	2800	125	75-125		
Selenium	208		12.0	mg/kg wet	200.00	11.3 U	104	75-125		
Silicon	1120		24.0	mg/kg wet	100.00	609	510*	75-125		
Silver	6.75		2.40	mg/kg wet	5.0000	2.26 U	135*	75-125		
Sodium	3450		600	mg/kg wet	2500.0	909	102	75-125		
Uranium	90900		240	mg/kg wet	500.00	71600	3840*	75-125		
Vanadium	59.1		30.0	mg/kg wet	50.000	7.72	103	75-125		
Zinc	147		120	mg/kg wet	50.000	80.6	133*	75-125		
Zirconium	13.7	B	30.0	mg/kg wet	500.00	4.36	1.87*	75-125		

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

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 L208064 - SW 3050B										
Reference (L208064-SRM1)				Prepared: 08/09/2012 Analyzed: 08/13/2012						
Aluminum	8400		14.4	mg/kg wet	6670.0		126	0-200.89		
Antimony	27.1		1.73	mg/kg wet	53.000		51.1	0-235.8		
Arsenic	111		2.88	mg/kg wet	114.00		97.3	82.8-117.54		
Barium	297		1.44	mg/kg wet	307.00		96.8	79.8-120.2		
Beryllium	103		0.144	mg/kg wet	108.00		95.3	82.8-117.6		
Boron	79.0		5.77	mg/kg wet	85.100		92.8	67.5-132.8		
Cadmium	221		0.577	mg/kg wet	225.00		98.4	83.6-116.4		
Calcium	3090		288	mg/kg wet	3360.0		92.0	83.3-116.9		
Chromium	75.8		0.577	mg/kg wet	77.200		98.1	73.3-126.4		
Cobalt	160		5.77	mg/kg wet	166.00		96.5	80.7-118.7		
Copper	258		2.88	mg/kg wet	271.00		95.1	80.8-119.2		
Iron	8080		57.7	mg/kg wet	8420.0		95.9	78.6-121.1		
Lead	180		1.44	mg/kg wet	190.00		94.7	81.6-118.4		
Lithium	117		7.21	mg/kg wet	114.00		103	50.9-148.2		
Magnesium	7560		216	mg/kg wet	8570.0		88.2	83.2-116.7		
Manganese	710		14.4	mg/kg wet	965.00		73.6	69.3-130.5		
Molybdenum	229		5.77	mg/kg wet	235.00		97.5	76.2-123.8		
Nickel	216		11.5	mg/kg wet	221.00		97.8	79.6-120.8		
Potassium	13700		1150	mg/kg wet	14400		95.3	81.9-118.1		
Selenium	185		2.88	mg/kg wet	187.00		99.1	75.9-124.6		
Silicon	257		5.77	mg/kg wet	807.00		31.8	0-219.3		
Silver	80.3		0.577	mg/kg wet	83.500		96.1	82.7-117.1		
Sodium	9360		144	mg/kg wet	9730.0		96.2	82.5-117.2		
Vanadium	97.9		7.21	mg/kg wet	98.700		99.2	75.9-123.6		
Zinc	193		28.8	mg/kg wet	199.00		97.1	78.4-121.6		
Batch L208126 - SW 3050B										
Blank (L208126-BLK1)				Prepared: 08/15/2012 Analyzed: 08/17/2012						
Zirconium	0.226	B	2.05	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/22/2012 12:20

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 L208126 - SW 3050B										
Duplicate (L208126-DUP1)		**Source: 1208019-01RE1**		Prepared: 08/15/2012 Analyzed: 08/17/2012						
Zirconium	6.91	B	27.8	mg/kg wet		8.95			25.7*	20
Matrix Spike (L208126-MS1)		**Source: 1208019-01RE1**		Prepared: 08/15/2012 Analyzed: 08/17/2012						
Zirconium	13.4	B	25.9	mg/kg wet	431.03	8.95	1.03*	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/22/2012 12:20

TCLP Metals by SW846 1311 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208139 - SW 3010A										
Blank (L208139-BLK1)				Prepared: 08/16/2012 Analyzed: 08/17/2012						
Arsenic	0.0150	U	0.0150	mg/L						
Barium	0.00100	U	0.00100	mg/L						
Cadmium	0.00300	U	0.00300	mg/L						
Chromium	0.00500	U	0.00500	mg/L						
Lead	0.0100	U	0.0100	mg/L						
Selenium	0.0200	U	0.0200	mg/L						
Silver	0.00600	U	0.00600	mg/L						
Blank (L208139-BLK2)				Prepared: 08/13/2012 Analyzed: 08/15/2012						
Arsenic	0.0750	U	0.0750	mg/L						
Barium	0.00500	U	0.00500	mg/L						
Cadmium	0.0150	U	0.0150	mg/L						
Chromium	0.00256	B	0.0250	mg/L						
Lead	0.0500	U	0.0500	mg/L						
Selenium	0.100	U	0.100	mg/L						
Silver	0.0300	U	0.0300	mg/L						
LCS (L208139-BS1)				Prepared: 08/16/2012 Analyzed: 08/17/2012						
Arsenic	9.84		0.0150	mg/L	10.000		98.4	80-120		
Barium	4.85		0.00100	mg/L	5.0000		97.0	80-120		
Cadmium	0.240		0.00300	mg/L	0.25000		96.1	80-120		
Chromium	0.486		0.00500	mg/L	0.50000		97.3	80-120		
Lead	2.35		0.0100	mg/L	2.5000		93.9	80-120		
Selenium	9.65		0.0200	mg/L	10.000		96.5	80-120		
Silver	0.475		0.00600	mg/L	0.50000		95.0	80-120		
Duplicate (L208139-DUP1)		**Source: 1208019-01**		Prepared: 08/16/2012 Analyzed: 08/17/2012						
Arsenic	0.0750	U	0.0750	mg/L		0.0750 U				20
Barium	0.0121		0.00500	mg/L		0.0128			5.26	20
Cadmium	0.0112	B	0.0150	mg/L		0.0116			3.07	20
Chromium	0.0311		0.0250	mg/L		0.0324			3.92	20
Lead	0.0250	B	0.0500	mg/L		0.0300			18.4	20
Selenium	0.100	U	0.100	mg/L		0.100 U				20
Silver	0.0300	U	0.0300	mg/L		0.0300 U				20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/22/2012 12:20

TCLP Metals by SW846 1311 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208139 - SW 3010A										
Matrix Spike (L208139-MS1)		**Source: 1208019-01**		Prepared: 08/16/2012 Analyzed: 08/17/2012						
Arsenic	5.21		0.0750	mg/L	5.0000	0.0750 U	104	50-1000		
Barium	96.9		0.00500	mg/L	100.00	0.0128	96.9	50-1000		
Cadmium	1.03		0.0150	mg/L	1.0000	0.0116	102	50-1000		
Chromium	5.07		0.0250	mg/L	5.0000	0.0324	101	50-1000		
Lead	4.80		0.0500	mg/L	5.0000	0.0300	95.4	50-1000		
Selenium	1.03		0.100	mg/L	1.0000	0.100 U	103	50-1000		
Silver	4.85		0.0300	mg/L	5.0000	0.0300 U	96.9	50-1000		
Batch L208171 - SW 7470A Prep										
Blank (L208171-BLK1)				Prepared: 08/20/2012 Analyzed: 08/21/2012						
Mercury	0.000200	U	0.000200	mg/L						
Blank (L208171-BLK2)				Prepared: 08/20/2012 Analyzed: 08/21/2012						
Mercury	0.000200	U	0.000200	mg/L						
LCS (L208171-BS1)				Prepared: 08/20/2012 Analyzed: 08/21/2012						
Mercury	0.00543		0.000200	mg/L	0.0050000		109	80-120		
Duplicate (L208171-DUP1)		**Source: 1208019-01**		Prepared: 08/20/2012 Analyzed: 08/21/2012						
Mercury	0.000200	U	0.000200	mg/L		0.000200 U				20
Matrix Spike (L208171-MS1)		**Source: 1208019-01**		Prepared: 08/20/2012 Analyzed: 08/21/2012						
Mercury	0.210		0.0100	mg/L	0.20000	0.000200 U	105	50-1000		

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208064
Date/Time Initiated: 8/9/12 1900
Date/Time Completed: 8/10/12 0130
Analyst: EB
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: 96°
BLOCK 1 2 (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
1207052-01		0.56	50		TOT	MIXED	PAPER, FOIL, DUST	NA	NA
01R		0.52	50			MIXED	PAPER, FOIL, DUST		
01S	0.5	0.54	50			MIXED	PAPER, FOIL, DUST		
02		0.51	50			MIXED	PAPER, FOIL, DUST		
1208001-01		0.57	50			SAND	DARK SANDY		
01R		0.52	50			SAND	DARK SANDY		
01S	0.5	0.58	50			SAND	DARK SANDY		
02		0.56	50			SAND	DARK SANDY		
03		0.52	50			fine	BROWN SOIL		
1208007-01		0.50	50			SAND	DARK SANDY		
01R		0.54	50			SAND	DARK SANDY		
* 01S	0.5	0.51	50			SAND	DARK SANDY		
1208008-01		0.59	50			fine	BROWN SANDY		
01R		0.54	50			fine	BROWN SANDY		
* 01S	0.5	0.53	50			fine	BROWN SANDY		
1208019-01		0.53	50			fine	yellow loamy		
01R		0.52	50			fine	yellow loamy		
* 01S	0.5	0.50	50			fine	yellow loamy		
BLK		0.53	50			COARSE	Boiling Chips		
(*) SRM	TEGn (*) 8/9/12	0.52	50			fine	Pink LOAMY		

EEn 8/9/12

Spiking IDs / Expiration Date:
MS#: 1200457
LCS#: (*) 1101357

Reagent IDs:
HNO_3 L08023
HCl L01031
H_2O_2 K09A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: 8/10/12

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TEGn 8/9/12
* (*) ALSO spiked w/ 0.25mL 1200380 (W) 1200386 (Zr)

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Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208126
Date/Time Initiated: 8/15/12 2030
Date/Time Completed: 8/16/12 0130
Analyst: TEB
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: ✓ NA
Temp: 94°
BLOCK 1 2 (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
1208019-01		0.52	50		TOT	fine	Yellow loamy	NA	NA
01R		0.54	50			fine	Yellow loamy		
+ 01S	0.5	0.58	50			fine	Yellow loamy		
1208040-01		0.51	50			fine	Brown Sand		
01R		0.52	50			fine	Brown Sand		
+ 01S	0.5	0.56	50			fine	Brown Sand		
1208018-01		0.55	50			fine	Black powder		
01R		0.52	50			fine	Black Powder		
01S	0.5	0.51	50			fine	Black Powder		
L208126-BLK		0.61	50			Coarse	Boiling chips		
SRM	✗	0.55	50			fine	Pink loamy		

strong reaction w/ H_2O_2

TEB 8/16/12

Spiking IDs / Expiration Date:
MS#: 1200457
LCS#: ✗ 1101357

Reagent IDs:
HNO_3 L08023
HCl L01031
H_2O_2 K09A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: 8/20/12

+ Also spiked w/ 0.250 mL ~~U-1200380~~ TE 8/15/12 Zr 1200386
+ Also spiked w/ 0.250 mL U-1200380 & Zr 1200386

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1143

Analyst: TCB
Date 8/8/12
Start Time/Temp: 2305 | 96°
End Time/Temp: 2335 | 96°

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

Prep Batch: L208055
Worksheet: HG080901
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10mL	50	
0.2 µg/L		0.100		10mL	50	
1.0		0.500		10mL	50	
2.0		1.000		10mL	50	
5.0		2.500		10mL	50	
10.0		5.000		10mL	50	
ICV		0.125	2.5	10mL	50	
CCV		0.250	5.0	10mL	50	
ICB/CCB				10mL	50	
L208055-BLK1				0.31	50	
SRM1		*	*	0.31	50	
1208014-02				0.30	50	
1208024-02				0.30	50	
04				0.32	50	
1208037-01				0.34	50	
01R				0.36	50	
01S		0.500	1.0	0.36	50	
1208038-01				0.35	50	
01R				0.31	50	
01S		0.500	1.0	0.37	50	
1208010-01				0.30	50	
01R				0.33	50	
01S		0.500	1.0	0.32	50	
1208019-01				0.36	50	R
01R				0.31	50	
01S		0.500	1.0	0.35	50	

TCB 8/8/12

Reviewed By/Date: [signature] 8/10/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	8/8/12 1900
ICV/CCV/LCS	IV 1200532	NA

Soil LCS True Value = 1.29 mg/Kg
Standard # 1101357

se book # 1143 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
ater LCS Spiking Concentration: 1.0 µg/ml

Page #:

ME-HgCVAA-Prep0910

000000025331

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208090
Date/Time Initiated: 8/13/12 1510
Date/Time Completed: 8/13/12 2200
Analyst: MW
Matrix (circle): Soil Water Other TCLP
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #:
Balance Cal Verification: Y NA
Temp: 96°
BLOCK 1 2 (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
1208002-01		50	50	<	TO	N/A	yellowish / clear		
L208090-DP1		50	50	<					
MS1	0.5	50	50						
1208015-01		10	50	<			tan / clear		
L208090-DP2		10	50	<					
MS2	0.1	10	50						
1208015-02		10	50	<			tan / clear		
03		10	50	<			tan / clear		
04		10	50	<			tan / clear		
1208018-01		50	50	<			amber / clear		
L208090-DP3		50	50	<					
MS3	0.5	50	50						
BLK1		50	50	<			clear / colorless		
BS1		50	50	<					
BLK2		50	50	<					
BLK3		50	50	<					

MW 8/13/12

Spiking IDs / Expiration Date:
MS#: 1101384
~~1200459~~ WE
1200388 MJ 8/14/12
LCS#: 1200458

Reagent IDs:
HNO_3 L08023
HCl
H_2O_2
1:1 HNO_3
1:1 HCl 637-069-01

File ID#:

Data Review By/Date:
RW 9/16/12

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BLK2 = L208025 (1208015)
BLK3 = L208046 (1208002, 1208018)

Page #:

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208139
Date/Time Initiated: 8/16/12 1945
Date/Time Completed: 8/17/12 0230
Analyst: EA
Matrix (circle): Soil Water Other leach.
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 #:
Balance Cal Verification: Y NA
Temp: 97°
BLOCK 1 2 (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
1208019-01		50	50	✓	TC	NA	Clear Colorless	NA	NA
~~1208019-01SR~~		50	50	✓	↓	↓	Clear Colorless	↓	↓
01S	0.5	50	50				Clear Colorless		
L208139-BLK		50	50				Clear Colorless		
BS	0.5	50	50				Clear Colorless		

EA 8/14/12

Spiking IDs / Expiration Date:
MS#: 1101384
~~1201459~~ EA 8/14/12
1200388
LCS#: 1200458 8/22/12

Reagent IDs:
HNO_3 L08023
HCl
H_2O_2
1:1 HNO_3 ~~637-066-02~~ EA 8/16/12
1:1 HCl 637-069-01

File ID#:

Data Review By/Date: 8/20/12

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Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1143

Analyst: [illegible]
Date 8/20/12
Start Time/Temp: 1900/95°
End Time/Temp: 2100/95°

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

Prep Batch: L208171
Worksheet: HG082012
SOP No. ME-HgCVAA
BLOCK 1 (3) 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				35	35	
0.2 µg/l		0.070		35	35	
1.0 µg/l		0.350		35	35	
2.0 µg/l		0.700		35	35	
5.0 µg/l		1.750		35	35	
10.0 µg/l		3.500		35	35	
ICV		0.0875	2.5	35	35	
CCV		0.175	5.0	35	35	
ICB/CCB				35	35	
L208171-BLK1				35	35	
BS1		0.175	5.0	35	35	
BLK2	<			35	35	L208046
1208019-01	<			35	35	RM1
L208171-DUP1	<			35	35	
MS1		0.700	200 *	35	35	

MW 8/20/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	8/20/12 1400
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 8/22/12

se book # 1145/1 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

* used 1200587 (10 µg/ml)

ME-HgCVAA-Prep0910

Page #:

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1146

Start Date: 8-8-12 Start Time: 11:37 Analyst: RH SOP: SPI-1311.1	End Date: 8-9-12 End Time: 5:30 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L208046 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria: 23°C ± 2°**

LvL #: 1208002-01 Client ID#: PAINT CHIPS pH After 5 Min: 5.49 pH After Acid/Heat: 1.87 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 25 Extract Fluid Vol.(mL): 500 pH After Extraction: 4.79	Initial Filtration Data and Comments: Solids: ____% / NA RAD I Initial Filtrate Added:
LvL #: 1208018-01 Client ID#: SHOT#97 A3+94 pH After 5 Min: 8.71 pH After Acid/Heat: 1.77 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 25 Extract Fluid Vol.(mL): 500 pH After Extraction: 4.94	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL # RH ~~1208019~~ 1208019-01 Client ID#: J1PX32 pH After 5 Min: 7.95 pH After Acid/Heat: 1.78 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 50 Extract Fluid Vol.(mL): 1000 pH After Extraction: 4.99	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL #: 1208046 Client ID#: N/A pH After 5 Min: N/A pH After Acid/Heat: Extraction Fluid/pH: N/A Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: ____% / NA Blank Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date	pH Acceptance Criteria
Fluid #1	1200956	7-30-12	1-30-13	4.93 ± 0.05
Fluid # 2				2.88 ± 0.05

SPI-1311.1-A-0310 Reviewed By/Date Rec 8/17/12 Page #

INORGANICS

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-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/15/2012 12:50

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PX32	1208019-01	Other Solid	08/02/2012 09:14	08/07/2012 13:50

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 KP0119
LVL#: 1208019 **Date Received:** 08-07-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 solid sample.

2. The sample was prepared and analyzed in accordance with the method indicated on the data summary report.

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

3. Sample holding times as required by the method and/or contract were met with the exception of Nitrate, Nitrite and Orthophosphate that were received past hold.

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy with the exceptions noted on the Sample Receipt Checklist.

5. TOC analysis could not be performed as the matrix was not amenable to the analysis.

6. The method blanks were within the method criteria.

7. The Laboratory Control Samples (LCS) were within the laboratory control limits.

8. The matrix spike recoveries were within the 75-125% control limits.

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

10. Results for solid samples are reported on an "as-received" weight basis.

11. 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

8/15/12
Date

njp\i08-019

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 9 pages.

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: KP0119	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/15/2012 12:50

Notes and Definitions

U	Analyte included in the analysis, but not detected
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
Dry	Sample results reported on a dry weight basis
Wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference
LOD	Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
LOQ	Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/15/2012 12:50

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PX32 (1208019-01) Other Solid									
Bromide	1.0 U	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Chloride	**5.8**	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Fluoride	1.0 U	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Nitrate	1.0 U	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Nitrite	1.0 U	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Orthophosphate	**20.3**	2.0	10.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)
Sulfate	**22.4**	1.0	5.0	mg/kg wet	1	L208119	08/14/2012	08/14/2012	EPA 300.0 (1993)

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: KP0119 Project Manager: Joan Kessner	**Reported:** 08/15/2012 12:50

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208119 - Default Prep GenChem										
Blank (L208119-BLK1)				Prepared & Analyzed: 08/14/2012						
Fluoride	1.0 U	1.0	5.0	mg/kg wet						
Chloride	1.0 U	1.0	5.0	mg/kg wet						
Bromide	1.0 U	1.0	5.0	mg/kg wet						
Orthophosphate	2.0 U	2.0	10.0	mg/kg wet						
Sulfate	1.0 U	1.0	5.0	mg/kg wet						
Nitrate	1.0 U	1.0	5.0	mg/kg wet						
Nitrite	1.0 U	1.0	5.0	mg/kg wet						
LCS (L208119-BS1)				Prepared & Analyzed: 08/14/2012						
Fluoride	49.6	1.0	5.0	mg/kg wet	50.000		99.2	80-120		
Chloride	48.7	1.0	5.0	mg/kg wet	50.000		97.4	80-120		
Bromide	49.8	1.0	5.0	mg/kg wet	50.000		99.6	80-120		
Orthophosphate	48.0	2.0	10.0	mg/kg wet	50.000		96.0	80-120		
Sulfate	50.3	1.0	5.0	mg/kg wet	50.000		101	80-120		
Nitrate	49.3	1.0	5.0	mg/kg wet	50.000		98.6	80-120		
Nitrite	50.2	1.0	5.0	mg/kg wet	50.000		100	80-120		
Duplicate (L208119-DUP1)		**Source: 1208019-01**		Prepared & Analyzed: 08/14/2012						
Fluoride	0.9 U	0.9	4.5	mg/kg wet		1.0 U				20
Chloride	6.3	0.9	4.5	mg/kg wet		5.8			7.77	20
Bromide	0.9 U	0.9	4.5	mg/kg wet		1.0 U				20
Orthophosphate	18.4	1.8	9.0	mg/kg wet		20.3			9.56	20
Sulfate	23.6	0.9	4.5	mg/kg wet		22.4			5.01	20
Nitrate	0.9 U	0.9	4.5	mg/kg wet		1.0 U				20
Nitrite	0.9 U	0.9	4.5	mg/kg wet		1.0 U				20
Matrix Spike (L208119-MS1)		**Source: 1208019-01**		Prepared & Analyzed: 08/14/2012						
Fluoride	50.0	1.0	4.9	mg/kg wet	49.245	1.0 U	102	75-125		
Chloride	55.4	1.0	4.9	mg/kg wet	49.245	5.8	101	75-125		
Bromide	50.4	1.0	4.9	mg/kg wet	49.245	1.0 U	102	75-125		
Orthophosphate	67.0	2.0	9.8	mg/kg wet	49.245	20.3	94.8	75-125		
Sulfate	71.8	1.0	4.9	mg/kg wet	49.245	22.4	100	75-125		
Nitrate	49.3	1.0	4.9	mg/kg wet	49.245	1.0 U	100	75-125		
Nitrite	51.0	1.0	4.9	mg/kg wet	49.245	1.0 U	104	75-125		