SAF-RC-154
618-10 & 618-11 Field Remediation – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 9/6/12
INITIAL/DATE

COMMENTS:

SDG K3975 SAF-RC-154

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 618-10 Pyro Drum (Sparky) R-1458

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

5 September 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 #	1208055
SDG #	K3975
SAF #	RC-154
Date Received	08/16/12
# Samples	2
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 27 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1208055

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-154

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: BW Del: Std TAT: 15 Days

Date Rec'd: 8/14/12 Date Due: 8/31/12

Refrigerator #										1							
#/Type Container	Liquid																
	Solid									1AG							
Volume	Liquid																
	Solid									250							
Preservatives																	
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal Hg	SN	I.C. Anions	NO2 NO3	pH				
		Lionville Laboratory Use Only															
									Met/Hg		Anions	Nitrates	pH				

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
W Water	01	J1PXF4			Soil	8-14-12	1220							X		X	X	X			
WW Waste Water	02	J1PXF5			↓	↓	1225							X		X	X	X			
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:

(1) Met = HSL + B + Mo + Si, Zr, W (no TL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
FedEx	V. Humandy	8/16/12	1515

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-154-093	Page 1 of 1

Collector: B. JOHNSON	Company Contact: Joan Kessner Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: 8L Data Turnaround: ~~21 Days~~ 15 DAYS RTC 8/13/12
Project Designation: 618-10 & 618-11 Field Remediation - Soil In-Process	Sampling Location: 618-10 Pyro Drum (Sparky) R-1458	SAF No.: RC-154	
Ice Chest No.: WCH-11-025	Field Logbook No.: EL-1648-02 COA: R618102600	Method of Shipment: FedEx	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A 110478	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive. L DOT Limits AJ 8-15-12

Special Handling and/or Storage

~~Cool 4 Deg C~~ NONE AJ 8-14-12

Preservation	Cool 4C	Cool 4C	None								
Type of Container	aG	aG	aG								
No. of Container(s)	1	0 RTC 8/13/12	1								
Volume	250mL	250mL	250mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; NO2/NO3 - 353.2; pH (Soil) - 9045	RCF GEA Shipping Screen AJ 8-15-12								

Sample No.	Matrix *	Sample Date	Sample Time	~~RCF~~ AJ 8-15-12				RCF					
J1PXF4	SOIL	8-14-12	1220	~~34212~~ X	288g X	X		34212					
J1PXF5	SOIL	8-14-12	1225	~~34213~~ X	287g X	X		34213					

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Brady Johnson / [signature]	1240 8-14-12	R Coffman / R Coffman	1240 8/14/12
R Coffman / R Coffman	1345 8/14/12	A Freier / A. Freier	1345 8-14-12
A Freier / A. Freier	WCH 8-14-12 1430	R Zimmerman / [signature]	RCF 1430 8-14-12
D Miller / D Miller	RCF 0915 8-15-12	A. Freier / A. Freier	0915 8-15-12
A. Freier / A. Freier	WCH 8-15-12 1225	Fed Ex	
Fed Ex	8/16/12 15:15	VICTOR HERNANDEZ	8/16/12 15:15

SPECIAL INSTRUCTIONS

Tranship Samples after RCF analysis is complete, to LVLI for the remaining analysis.

(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, Uranium, Vanadium, Zinc, Zirconium}; Mercury - 7471 - (CV) {Mercury}

Sample cooling not maintained AJ 8-14-12

Matrix *

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

REVIEWED BY MWS Lea DATE 8/15/12

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

WCH-EE-011

000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAE/SOW/Release #: RC-154

Date: 8/16/12

LvL Batch #: 1208055

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 798751211674
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-11-025
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 OS 8/17/12	☑ No NO2, NO3 rec'd out of hold	
Short holds taken to wet lab?	☐ Yes	☐ No OP04	☑ 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 OS 8/17/12	☑ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted_____ Date_____

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-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PXF4	1208055-01	Soil	08/14/2012 12:20	08/16/2012 15:15
J1PXF5	1208055-02	Soil	08/14/2012 12:25	08/16/2012 15:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-154
LVL#: 1208055
SDG/SAF#: K3975/RC-154

W.O.#: 60049-001-001-0001-00
Date Received: 08-16-12

METALS

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

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

1. This narrative covers the analyses of 2 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 blank 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. There is no Uranium or Zirconium result for reference sample L208192-SRM1 due to the standard reference material does not contain Uranium and Zirconium. The matrix spike recoveries for Uranium and Zirconium were below the 75-125% control limit, however the soil samples were reported for Uranium and Zirconium as per the project manager.

10. The matrix spike (MS) recoveries for 15 analytes were outside the 75-125% control limits.

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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
J1PXF4	Aluminum	22,000	70.6
	Antimony	100	75.3
	Beryllium	100	72.4
	Boron	100	70.2
	Cadmium	100	74.7
	Cobalt	100	67.9
	Iron	42,000	38.5
	Lead	100	66.0
	Manganese	1,000	63.8
	Molybdenum	100	72.7
	Nickel	100	68.6
	Selenium	100	71.7
	Silicon	2,100	78.6
	Uranium	500	75.1
	Zirconium	500	78.0

12. The duplicate analyses for 2 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 result for Molybdenum was 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.

Iain Daniels
Laboratory Manager
Lionville Laboratory

8/27/12
Date

alm/08-055hg%

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

WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

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-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

J1PXF4

1208055-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**4370**		4.65	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Antimony	0.558	U	0.558	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Arsenic	**1.73**		0.930	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Barium	**52.3**		0.465	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Beryllium	**0.191**		0.186	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Boron	1.86	U	1.86	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Cadmium	**0.0567**	B	0.186	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Calcium	**5490**		93.0	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Chromium	**4.06**		0.186	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Cobalt	**6.17**		1.86	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Copper	**11.0**		0.930	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Iron	**21700**		18.6	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Lead	**2.66**		0.465	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Magnesium	**3500**		69.8	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Manganese	**270**		4.65	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Molybdenum	**0.514**	B	1.86	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Nickel	**5.47**		3.72	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Potassium	**616**		372	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Selenium	0.279	U	0.279	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Silicon	**290**		1.86	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Silver	0.186	U	0.186	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Sodium	**291**		46.5	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Uranium	18.6	U	18.6	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Vanadium	**69.3**		2.33	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Zinc	**41.2**		9.30	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Zirconium	**23.0**		4.65	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Mercury	0.0249	U	0.0249	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

J1PXF5

1208055-02 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**4730**		4.71	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Antimony	0.565	U	0.565	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Arsenic	**1.93**		0.942	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Barium	**68.1**		0.471	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Beryllium	**0.202**		0.188	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Boron	**0.634**	B	1.88	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Cadmium	**0.0789**	B	0.188	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Calcium	**5100**		94.2	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Chromium	**4.45**		0.188	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Cobalt	**6.35**		1.88	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Copper	**10.5**		0.942	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Iron	**20300**		18.8	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Lead	**2.70**		0.471	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Magnesium	**3600**		70.6	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Manganese	**274**		4.71	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Molybdenum	**0.591**	B	1.88	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Nickel	**6.24**		3.77	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Potassium	**692**		377	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Selenium	0.282	U	0.282	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Silicon	**345**		1.88	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Silver	0.188	U	0.188	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Sodium	**235**		47.1	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Uranium	**260**		18.8	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Vanadium	**61.9**		2.35	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Zinc	**39.1**		9.42	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Zirconium	**21.4**		4.71	mg/kg dry	1	L208192	08/21/2012	08/23/2012	6010B
Mercury	0.0282	U	0.0282	mg/kg dry	1	L208227	08/23/2012	08/24/2012	7471A

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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

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 L208192 - SW 3050B										
Blank (L208192-BLK1)				Prepared: 08/21/2012 Analyzed: 08/23/2012						
Aluminum	4.90	U	4.90	mg/kg wet						
Antimony	0.588	U	0.588	mg/kg wet						
Arsenic	0.980	U	0.980	mg/kg wet						
Barium	0.490	U	0.490	mg/kg wet						
Beryllium	0.196	U	0.196	mg/kg wet						
Boron	1.96	U	1.96	mg/kg wet						
Cadmium	0.196	U	0.196	mg/kg wet						
Calcium	98.0	U	98.0	mg/kg wet						
Chromium	0.196	U	0.196	mg/kg wet						
Cobalt	1.96	U	1.96	mg/kg wet						
Copper	0.980	U	0.980	mg/kg wet						
Iron	19.6	U	19.6	mg/kg wet						
Lead	0.490	U	0.490	mg/kg wet						
Magnesium	73.5	U	73.5	mg/kg wet						
Manganese	4.90	U	4.90	mg/kg wet						
Molybdenum	1.96	U	1.96	mg/kg wet						
Nickel	3.92	U	3.92	mg/kg wet						
Potassium	392	U	392	mg/kg wet						
Selenium	0.294	U	0.294	mg/kg wet						
Silicon	1.96	U	1.96	mg/kg wet						
Silver	0.196	U	0.196	mg/kg wet						
Sodium	49.0	U	49.0	mg/kg wet						
Uranium	19.6	U	19.6	mg/kg wet						
Vanadium	2.45	U	2.45	mg/kg wet						
Zinc	9.80	U	9.80	mg/kg wet						
Zirconium	0.197	B	4.90	mg/kg wet						
Duplicate (L208192-DUP2)		**Source: 1208055-01**		Prepared: 08/21/2012 Analyzed: 08/23/2012						
Aluminum	4290		4.49	mg/kg dry		4370			2	20
Antimony	0.539	U	0.539	mg/kg dry		0.558 U				20
Arsenic	1.60		0.898	mg/kg dry		1.73			8	20
Barium	48.4		0.449	mg/kg dry		52.3			8	20
Beryllium	0.185		0.180	mg/kg dry		0.191			3	20
Boron	0.557	B	1.80	mg/kg dry		1.86 U				20
Cadmium	0.0550	B	0.180	mg/kg dry		0.0567			3	20
Calcium	5180		89.8	mg/kg dry		5490			6	20
Chromium	8.31		0.180	mg/kg dry		4.06			69*	20

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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

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 L208192 - SW 3050B										
Duplicate (L208192-DUP2)		**Source: 1208055-01**		Prepared: 08/21/2012 Analyzed: 08/23/2012						
Cobalt	6.04		1.80	mg/kg dry		6.17			2	20
Copper	10.5		0.898	mg/kg dry		11.0			4	20
Iron	20600		18.0	mg/kg dry		21700			5	20
Lead	2.60		0.449	mg/kg dry		2.66			2	20
Magnesium	3750		67.3	mg/kg dry		3500			7	20
Manganese	268		4.49	mg/kg dry		270			0.7	20
Molybdenum	0.367	B	1.80	mg/kg dry		0.514			33*	20
Nickel	9.33		3.59	mg/kg dry		5.47			52*	20
Potassium	591		359	mg/kg dry		616			4	20
Selenium	0.269	U	0.269	mg/kg dry		0.279 U				20
Silicon	309		1.80	mg/kg dry		290			6	20
Silver	0.180	U	0.180	mg/kg dry		0.186 U				20
Sodium	248		44.9	mg/kg dry		291			16	20
Uranium	18.0	U	18.0	mg/kg dry		18.6 U				20
Vanadium	65.2		2.24	mg/kg dry		69.3			6	20
Zinc	39.5		8.98	mg/kg dry		41.2			4	20
Zirconium	21.9		4.49	mg/kg dry		23.0			5	20
Matrix Spike (L208192-MS2)		**Source: 1208055-01**		Prepared: 08/21/2012 Analyzed: 08/23/2012						
Aluminum	6430		4.74	mg/kg dry	189.48	4370	1080*	75-125		
Antimony	18.9		0.568	mg/kg dry	47.370	0.558 U	40*	75-125		
Arsenic	145		0.947	mg/kg dry	189.48	1.73	75	75-125		
Barium	206		0.474	mg/kg dry	189.48	52.3	81	75-125		
Beryllium	3.70		0.189	mg/kg dry	4.7370	0.191	74*	75-125		
Boron	64.6		1.89	mg/kg dry	94.741	1.86 U	68*	75-125		
Cadmium	3.57		0.189	mg/kg dry	4.7370	0.0567	74*	75-125		
Calcium	8340		94.7	mg/kg dry	2368.5	5490	120	75-125		
Chromium	19.6		0.189	mg/kg dry	18.948	4.06	82	75-125		
Cobalt	41.1		1.89	mg/kg dry	47.370	6.17	74*	75-125		
Copper	29.3		0.947	mg/kg dry	23.685	11.0	77	75-125		
Iron	22600		18.9	mg/kg dry	94.741	21700	1000*	75-125		
Lead	35.1		0.474	mg/kg dry	47.370	2.66	68*	75-125		
Magnesium	5740		71.1	mg/kg dry	2368.5	3500	94	75-125		
Manganese	340		4.74	mg/kg dry	47.370	270	149*	75-125		
Molybdenum	70.5		1.89	mg/kg dry	94.741	0.514	74*	75-125		
Nickel	39.9		3.79	mg/kg dry	47.370	5.47	73*	75-125		
Potassium	2500		379	mg/kg dry	2368.5	616	79	75-125		

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

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 L208192 - SW 3050B									
Matrix Spike (L208192-MS2)		**Source: 1208055-01**	Prepared: 08/21/2012 Analyzed: 08/23/2012						
Selenium	134	0.284	mg/kg dry	189.48	0.279 U	71*	75-125		
Silicon	541	1.89	mg/kg dry	94.741	290	265*	75-125		
Silver	3.75	0.189	mg/kg dry	4.7370	0.186 U	79	75-125		
Sodium	2400	47.4	mg/kg dry	2368.5	291	89	75-125		
Uranium	343	18.9	mg/kg dry	473.70	18.6 U	72*	75-125		
Vanadium	109	2.37	mg/kg dry	47.370	69.3	83	75-125		
Zinc	80.2	9.47	mg/kg dry	47.370	41.2	82	75-125		
Zirconium	374	4.74	mg/kg dry	473.70	23.0	74*	75-125		
Reference (L208192-SRM1)			Prepared: 08/21/2012 Analyzed: 08/23/2012						
Aluminum	10900	13.9	mg/kg wet	6670.0		164	0-200.89		
Antimony	37.2	1.67	mg/kg wet	53.000		70	0-235.8		
Arsenic	118	2.78	mg/kg wet	114.00		104	82.8-117.54		
Barium	321	1.39	mg/kg wet	307.00		104	79.8-120.2		
Beryllium	108	0.556	mg/kg wet	108.00		100	82.8-117.6		
Boron	79.9	5.56	mg/kg wet	85.100		94	67.5-132.8		
Cadmium	227	0.556	mg/kg wet	225.00		101	83.6-116.4		
Calcium	3400	278	mg/kg wet	3360.0		101	83.3-116.9		
Chromium	84.3	0.556	mg/kg wet	77.200		109	73.3-126.4		
Cobalt	165	5.56	mg/kg wet	166.00		100	80.7-118.7		
Copper	272	2.78	mg/kg wet	271.00		100	80.8-119.2		
Iron	8620	55.6	mg/kg wet	8420.0		102	78.6-121.1		
Lead	191	1.39	mg/kg wet	190.00		101	81.6-118.4		
Magnesium	8170	208	mg/kg wet	8570.0		95	83.2-116.7		
Manganese	1010	13.9	mg/kg wet	965.00		105	69.3-130.5		
Molybdenum	236	5.56	mg/kg wet	235.00		100	76.2-123.8		
Nickel	228	11.1	mg/kg wet	221.00		103	79.6-120.8		
Potassium	14800	1110	mg/kg wet	14400		103	81.9-118.1		
Selenium	188	0.833	mg/kg wet	187.00		101	75.9-124.6		
Silicon	699	5.56	mg/kg wet	807.00		87	0-219.3		
Silver	83.8	0.556	mg/kg wet	83.500		100	82.7-117.1		
Sodium	9670	139	mg/kg wet	9730.0		99	82.5-117.2		
Vanadium	109	6.94	mg/kg wet	98.700		111	75.9-123.6		
Zinc	201	27.8	mg/kg wet	199.00		101	78.4-121.6		

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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/24/2012 12:29

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 L208227 - SW 7471A Prep										
Blank (L208227-BLK1)				Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L208227-DUP2)		**Source: 1208055-01**		Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.0249	U	0.0249	mg/kg dry		0.0249 U				20
Matrix Spike (L208227-MS2)		**Source: 1208055-01**		Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	0.151		0.0256	mg/kg dry	0.14211	0.0249 U	106	75-125		
Reference (L208227-SRM1)				Prepared: 08/23/2012 Analyzed: 08/24/2012						
Mercury	1.28		0.0281	mg/kg wet	1.2900		99.4	62.6-138		

Lionville Laboratory Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208192
Date/Time Initiated: 8/21/12 2130
Date/Time Completed: 8/22/12 0305
Analyst: [illegible]
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:
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
1208065-01		0.59	50		TOT	fine	TAN SOIL	NA	NA
L208192-DUP1		0.56	50			fine	TAN SOIL		
MS1	0.5	0.53	50			fine	TAN SOIL		
1208065-02		0.54	50			fine	TAN SOIL		
03		0.53	50			fine	TAN SOIL		
04		0.54	50			fine	TAN SOIL		
05		0.52	50			fine	TAN SOIL		
06		0.59	50			fine	TAN SOIL		
07		0.54	50			fine	TAN SOIL		
08		0.55	50			fine	TAN SOIL		
09		0.51	50			fine	TAN SOIL		
10		0.52	50			fine	TAN SOIL		
11		0.59	50			fine	TAN SOIL		
12		0.52	50			fine	TAN SOIL		
13		0.52	50			fine	TAN SOIL		
14		0.59	50			fine	TAN SOIL		
L208192-BLK		0.51	50			coarse	Boiling Chips		
* SRM	*	0.54	50			fine	Pink Loamy		
1208055-01		0.55	50			fine	Brown Sandy		
L208192-DUP2		0.57	50			fine	~~TAN SOIL~~ Brown Sandy		
* MS2	0.5	0.54	50			fine	Brown Sandy		
1208055-02		0.55	50			fine	Brown Sandy		

[illegible] 8/21/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: * 1201014

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: [illegible] 8/22/12

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

* Also spiked 0.250 mL Ti - 1200380
0.250 mL Zr 1200386

Page #: 95

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: TLB
Date 8/23/12
Start Time/Temp: 23 ~~4~~45 | 94°
End Time/Temp: TEC 8/23/12 5015 | 96°

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

Prep Batch: L208227
Worksheet: HG082401
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	
L208227-BLK				0.31	50	
SRM		*	*	0.32	50	
1208040-01				0.34	50	
L208227-DUP1				0.37	50	
MS1		0.5	1.0	0.36	50	
1208055-01				0.37	50	
L208227-DUP2				0.37	50	
MS2		0.5	1.0	0.36	50	
1208055-02				0.33	50	
1208056-01				0.31	50	
L2080227-DUP3				0.35	50	
MS3		0.5	1.0	0.31	50	
1208066-01				0.34	50	
L208227-DUP4				0.37	50	
MS4		0.5	1.0	0.34	50	
1208066-02				0.33	50	
128077-01				0.32	50	
L208227-DUP5				0.35	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	8/23/12 1900
ICV/CCV/LCS	IV 1200532	NA

Reviewed By/Date: [signature] 8/24/12

se book # 1153 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # * 1201514

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

ME-HgCVAA-Prep0910

Page #:

000000018

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: EP
Date 8/23/12
Start Time/Temp: see page 03
End Time/Temp:

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

Prep Batch: L208227
Worksheet: HG082401
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.
L208227-MS5		0.5	1.0	0.35	50	
1208077-02				0.36	50	
03				0.37	50	
04				0.33	50	
05				0.31	50	
06				0.39	50	
07				0.31	50	
08				0.36	50	
1208078-01				0.38	50	
L208227-DUP6				0.34	50	
MS6		0.5	1.0	0.38	50	

MW for TLB 8/24/12

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

see page 03

Reviewed By/Date: MW 8/24/12

se book # 1153 for std traceability information

Soil LCS True Value = see page 03 mg/kg
Standard # _____

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

WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 17:41

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PXF4	1208055-01	Soil	08/14/2012 12:20	08/16/2012 15:15
J1PXF5	1208055-02	Soil	08/14/2012 12:25	08/16/2012 15:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-154 K3975
LVL#: 1208055 **Date Received:** 08-16-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 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 with the exceptions 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. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits and method criteria.

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

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

9. Results for soil samples are reported on a dry weight basis.

10. 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

9/4/12
Date

njp\i08-055

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 10 pages.

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 17:41

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.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 17:41

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PXF4 (1208055-01) Soil										
%Solids	**97.7**			0.1	% by Weight	1	L208149	08/17/2012 14:30	08/17/2012 14:30	SM2540G
Bromide	1.0	U	1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Chloride	**14.0**		1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrate	1.0	U	1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Orthophosphate	2.0	U	2.0	9.8	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Sulfate	**8.5**		1.0	4.9	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.10	U	0.10	0.49	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:00	EPA 353.2
pH	**8.87**		0.10	0.10	pH Units	1	L208215	08/22/2012 20:29	08/22/2012 20:29	SW846 9045
J1PXF5 (1208055-02) Soil										
%Solids	**96.6**			0.1	% by Weight	1	L208149	08/17/2012 14:30	08/17/2012 14:30	SM2540G
Bromide	1.0	U	1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Chloride	**35.4**		1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrate	1.0	U	1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Orthophosphate	2.1	U	2.1	10.4	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Sulfate	**10.5**		1.0	5.2	mg/kg dry	1	L208208	08/22/2012 15:00	08/22/2012 23:50	EPA 300.0 (1993)
Nitrate/Nitrite as N	0.10	U	0.10	0.52	mg/kg dry	1	L208210	08/28/2012 13:00	08/29/2012 10:03	EPA 353.2
pH	**8.69**		0.10	0.10	pH Units	1	L208215	08/22/2012 20:29	08/22/2012 20:29	SW846 9045

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-154 Project Number: K3975 Project Manager: Joan Kessner	**Reported:** 08/30/2012 17:41

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208149 - % Solids										
Duplicate (L208149-DUP1)	**Source: 1208055-01**			Prepared: 08/17/2012 14:30 Analyzed: 08/17/2012 14:30						
%Solids	97.6		0.1	% by Weight		97.7			0.2	20
Batch L208208 - Default Prep GenChem										
Blank (L208208-BLK1)				Prepared: 08/22/2012 15:00 Analyzed: 08/22/2012 23:50						
Fluoride	1.0 U	1.0	4.8	mg/kg wet						
Chloride	1.0 U	1.0	4.8	mg/kg wet						
Bromide	1.0 U	1.0	4.8	mg/kg wet						
Orthophosphate	1.9 U	1.9	9.6	mg/kg wet						
Sulfate	1.0 U	1.0	4.8	mg/kg wet						
Nitrate	1.0 U	1.0	4.8	mg/kg wet						
Nitrite	1.0 U	1.0	4.8	mg/kg wet						
LCS (L208208-BS1)				Prepared: 08/22/2012 15:00 Analyzed: 08/22/2012 23:50						
Fluoride	45.4	1.0	4.8	mg/kg wet	47.619		95.4	80-120		
Chloride	44.2	1.0	4.8	mg/kg wet	47.619		92.8	80-120		
Bromide	45.1	1.0	4.8	mg/kg wet	47.619		94.8	80-120		
Orthophosphate	46.5	1.9	9.5	mg/kg wet	47.619		97.6	80-120		
Sulfate	45.6	1.0	4.8	mg/kg wet	47.619		95.8	80-120		
Nitrate	45.0	1.0	4.8	mg/kg wet	47.619		94.4	80-120		
Nitrite	45.6	1.0	4.8	mg/kg wet	47.619		95.8	80-120		
Duplicate (L208208-DUP2)	**Source: 1208055-01**			Prepared: 08/22/2012 15:00 Analyzed: 08/22/2012 23:50						
Fluoride	1.0 U	1.0	5.0	mg/kg dry		1.0 U				20
Chloride	13.7	1.0	5.0	mg/kg dry		14.0			2.80	20
Bromide	1.0 U	1.0	5.0	mg/kg dry		1.0 U				20
Orthophosphate	2.0 U	2.0	10.0	mg/kg dry		2.0 U				20
Sulfate	8.9	1.0	5.0	mg/kg dry		8.5			3.75	20
Nitrate	1.0 U	1.0	5.0	mg/kg dry		1.0 U				20
Nitrite	1.0 U	1.0	5.0	mg/kg dry		1.0 U				20

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WC-Hanford, Inc.	Project: RC-154	
2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 17:41

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208208 - Default Prep GenChem										
Matrix Spike (L208208-MS2)	**Source: 1208055-01**			Prepared: 08/22/2012 15:00 Analyzed: 08/22/2012 23:50						
Fluoride	50.3	1.0	5.0	mg/kg dry	49.574	1.0 U	101	75-125		
Chloride	63.9	1.0	5.0	mg/kg dry	49.574	14.0	100	75-125		
Bromide	48.6	1.0	5.0	mg/kg dry	49.574	1.0 U	98.0	75-125		
Orthophosphate	56.4	2.0	9.9	mg/kg dry	49.574	2.0 U	114	75-125		
Sulfate	58.9	1.0	5.0	mg/kg dry	49.574	8.5	102	75-125		
Nitrate	49.7	1.0	5.0	mg/kg dry	49.574	1.0 U	100	75-125		
Nitrite	49.9	1.0	5.0	mg/kg dry	49.574	1.0 U	101	75-125		
Batch L208210 - Default Prep GenChem										
Blank (L208210-BLK1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 09:57						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L208210-BS1)				Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 09:56						
Nitrate/Nitrite as N	4.77	0.10	0.50	mg/kg wet	5.0000		95.4	90-110		
Duplicate (L208210-DUP2)	**Source: 1208055-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 10:02						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg dry		0.10 U				20
Matrix Spike (L208210-MS2)	**Source: 1208055-01**			Prepared: 08/28/2012 13:00 Analyzed: 08/29/2012 10:31						
Nitrate/Nitrite as N	4.90	0.10	0.50	mg/kg dry	5.0305	0.10 U	97.4	75-125		
Batch L208215 - Default Prep GenChem										
Duplicate (L208215-DUP1)	**Source: 1208055-01**			Prepared: 08/22/2012 20:29 Analyzed: 08/22/2012 20:29						
pH	8.92	0.10	0.10	pH Units		8.87			0.562	20

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2620 Fermi Avenue	Project Number: K3975	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/30/2012 17:41

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208215 - Default Prep GenChem										
Reference (L208215-SRM1)				Prepared: 08/22/2012 20:29 Analyzed: 08/22/2012 20:29						
pH	10.0	0.10	0.10	pH Units	10.000		100	99-101		
Reference (L208215-SRM2)				Prepared: 08/22/2012 20:29 Analyzed: 08/22/2012 20:29						
pH	10.0	0.10	0.10	pH Units	10.000		100	99-101		
Reference (L208215-SRM3)				Prepared: 08/22/2012 20:29 Analyzed: 08/22/2012 20:29						
pH	10.0	0.10	0.10	pH Units	10.000		100	99-101		