SAF-RC-029
Remaining Sites Confirmation Sampling – Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

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

COMMENTS:

SDG K3964 SAF RC-029

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Waste Site: 100-D-98:2

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

20 August 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 #	1208012
SDG #	K3964
SAF #	RC-029
Date Received	08/03/12
# Samples	5
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
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 55 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1208012

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: W C Hanford SAF# RC-029
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: Std. TAT: 15 days

Date Rec'd: 8.3.12 Date Due: 8.18.12

Refrigerator #			A		B			C			D		E		
			1		1			1			1		1		
#/Type Container	Liquid														
	Solid		1AG		1AG			1AG			1AG		1AG		
Volume	Liquid														
	Solid		120		120			60			120		120		
Preservatives			—		—			—			—		—		
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb	8270/HD		INORG: Metal Hg	CN		TC Anions		PH		
Lionville Laboratory Use Only				8082		Diq/HD		Met/Hg			Anions		pH		

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	J1PWH5			Soil	8-1-12	1000			X		X			X				
	02	6					1005			X		X			X				
	03	7					1305			X		X			X		X		X
	04	8					1310			X		X			X		X		X
	05	9					1415			X		X			X				

Special Instructions:

① Met = HBL + B, Mo, Si (no TL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	8/3/12	1000

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-145	Page 1 of 1

Collector Q. Stowe	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code 8C	Data Turnaround 15 Days		
Project Designation Remaining Sites Confirmation Sampling - Soil Full Protocol	Sampling Location 100-D-98:2		SAF No. RC-029
Ice Chest No. RCC-08-027	Field Logbook No. EL-1662-01	COA C10D98A000	Method of Shipment AT 8-1-12 Hac Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A110479		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly.

Special Handling and/or Storage

Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	120mL	120mL	120mL	120mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PCBs - 8082	IC Anions 300	pH 9045						
Sample No. / Matrix * / Sample Date / Sample Time											
J1PWH5 / SOIL / 8/1/12 / 1000	X	X	X								
J1PWH6 / SOIL / 8/1/12 / 1005	X	X	X								
J1PWH7 / SOIL / 8/1/12 / 1305	X	X	X	X	X						
J1PWH8 / SOIL / 8/1/12 / 1310	X	X	X	X	X						
J1PWH9 / SOIL / 8/1/12 / 1415	X	X	X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	1445 8/1/12	MZM MSTankovich	1445 Cold 8/1/12
MZM MSTankovich	WCH 1535 8-1-12	A. Freier	1060#1 1535 8-1-12
A. Freier	WCH 1060#1 8-2-12 0940	Fed Ex	
Fed Ex	8/3/12 1000	VICTOR HERNANDEZ	8-3-12 1000

SPECIAL INSTRUCTIONS

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

REVIEWED BY JEB DATE 8-2-12

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

000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-029

Date: 8/ /12

LvL Batch #: 1208

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7938 6063 2602
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 # RCC-08-027
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 _____

PCBs

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/15/2012 20:15

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PWH5	1208012-01	Soil	08/01/2012 10:00	08/03/2012 10:00
J1PWH6	1208012-02	Soil	08/01/2012 10:05	08/03/2012 10:00
J1PWH7	1208012-03	Soil	08/01/2012 13:05	08/03/2012 10:00
J1PWH8	1208012-04	Soil	08/01/2012 13:10	08/03/2012 10:00
J1PWH9	1208012-05	Soil	08/01/2012 14:15	08/03/2012 10:00

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-029 K3964
LVL #: 1208012

W.O. #: 60049-001-001-0001-00
Received: 08-03-2012

PCBs

Five (5) soil samples were collected on 08-01-2012.

The samples and associated QC samples were extracted 08-08-2012 and analyzed 08-14-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

Lionville Laboratory (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. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The samples are reported on a dry weight basis.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. Per SW846 Method 8000B, the attached table lists compounds where the %difference or drift was greater than 15%, and the mean across all compounds was used for evaluation of the continuing calibration. The data reflected an increase in instrument response, so the ability to identify targets was not impaired.
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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

8/20/12
Date

r:\group\data\2012\pcb\wc hanford\1208012oj.doc

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.

8082/A PCBs
Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 08.14.12 8:30:26 AM		CCV2 08.14.12 2:41:54 PM		CCV3 08.14.12 8:46:25 PM		CCV4		CCV5		CCV6		CCV7		CCV8	
	OK Primary	OK Secondary	OK Primary	Secondary	OK Primary	OK Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)																
Aroclor 1016-1				✓												
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1																
Aroclor 1260-2																
Aroclor 1260-3				✓												
Aroclor 1260-4				✓												
Aroclor 1260-5				✓												
Mean %D or %Drift	1.2	9.3	7.4	16.9	3.6	12.6										

Sample results reported from affected CCV:

CCV1: _____

CCV2: 1208012 - 01, 02, 03, 04, 05; L208053- MS1, MSD1

CCV3: _____

CCV4: _____

CCV5: _____

CCV6: _____

CCV7: _____

CCV8: _____

GLOSSARY OF DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.
.I	=	Indicates an interference on one analytical column only. Result is reported from remaining analytical column.
P	=	This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/15/2012 20:15

J1PWH5
1208012-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1221	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1232	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1242	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1248	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1254	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1260	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1262	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1268	13.5	U	13.5	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Surrogate: Decachlorobiphenyl	*115 %*		*43-144*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*107 %*		*52-141*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3964 Project Manager: Joan Kessner	**Reported:** 08/15/2012 20:15

J1PWH6
1208012-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1221	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1232	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1242	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1248	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1254	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1260	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1262	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1268	13.6	U	13.6	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Surrogate: Decachlorobiphenyl	*114 %*		*43-144*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*100 %*		*52-141*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/15/2012 20:15

J1PWH7
1208012-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1221	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1232	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1242	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1248	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1254	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1260	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1262	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1268	13.8	U	13.8	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Surrogate: Decachlorobiphenyl	*104 %*		*43-144*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*104 %*		*52-141*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3964 Project Manager: Joan Kessner	**Reported:** 08/15/2012 20:15

J1PWH8
1208012-04 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1221	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1232	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1242	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1248	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1254	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1260	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1262	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1268	14.0	U	14.0	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Surrogate: Decachlorobiphenyl	*114 %*		*43-144*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*108 %*		*52-141*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3964 Project Manager: Joan Kessner	**Reported:** 08/15/2012 20:15

J1PWH9
1208012-05 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1221	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1232	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1242	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1248	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1254	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1260	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1262	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Aroclor 1268	13.2	U	13.2	ug/kg dry	1	L208053	08/08/2012	08/14/2012	8082
Surrogate: Decachlorobiphenyl	*113 %*		*43-144*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*108 %*		*52-141*			*L208053*	*08/08/2012*	*08/14/2012*	*8082*

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/15/2012 20:15

Polychlorinated Biphenyls by SW846 8082 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208053 - SW 3540C										
Blank (L208053-BLK1)				Prepared: 08/08/2012 Analyzed: 08/14/2012						
Aroclor 1016	13.3	U	13.3	ug/kg wet						
Aroclor 1221	13.3	U	13.3	ug/kg wet						
Aroclor 1232	13.3	U	13.3	ug/kg wet						
Aroclor 1242	13.3	U	13.3	ug/kg wet						
Aroclor 1248	13.3	U	13.3	ug/kg wet						
Aroclor 1254	13.3	U	13.3	ug/kg wet						
Aroclor 1260	13.3	U	13.3	ug/kg wet						
Aroclor 1262	13.3	U	13.3	ug/kg wet						
Aroclor 1268	13.3	U	13.3	ug/kg wet						
Surrogate: Decachlorobiphenyl	*37.1*			*ug/kg wet*	*33.333*		*111*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.6*			*ug/kg wet*	*33.337*		*101*	*52-141*		
LCS (L208053-BS1)				Prepared: 08/08/2012 Analyzed: 08/14/2012						
Aroclor 1016	136		13.3	ug/kg wet	166.67		82	50-138		
Aroclor 1260	152		13.3	ug/kg wet	166.67		91	50-148		
Surrogate: Decachlorobiphenyl	*35.7*			*ug/kg wet*	*33.333*		*107*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.0*			*ug/kg wet*	*33.337*		*105*	*52-141*		
Matrix Spike (L208053-MS1)		**Source: 1208012-05**		Prepared: 08/08/2012 Analyzed: 08/14/2012						
Aroclor 1016	150		13.6	ug/kg dry	169.83	13.2 U	88	50-138		
Aroclor 1260	167		13.6	ug/kg dry	169.83	13.2 U	98	50-148		
Surrogate: Decachlorobiphenyl	*38.4*			*ug/kg dry*	*33.967*		*113*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*38.0*			*ug/kg dry*	*33.970*		*112*	*52-141*		
Matrix Spike Dup (L208053-MSD1)		**Source: 1208012-05**		Prepared: 08/08/2012 Analyzed: 08/14/2012						
Aroclor 1016	144		13.5	ug/kg dry	169.10	13.2 U	85	50-138	4	40
Aroclor 1260	159		13.5	ug/kg dry	169.10	13.2 U	94	50-148	4	40
Surrogate: Decachlorobiphenyl	*37.3*			*ug/kg dry*	*33.821*		*110*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*37.6*			*ug/kg dry*	*33.824*		*111*	*52-141*		

PREPARATION BENCH SHEET

L208053

Lionville Laboratory

Printed: 8/9/2012 2:00:57PM

000000017

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200502**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1208012-01	8082 PCBs	08/08/2012 16:03	30.37	10				250	WC-Hanford, Inc.	
1208012-02	8082 PCBs	08/08/2012 16:03	30.36	10				250	WC-Hanford, Inc.	
1208012-03	8082 PCBs	08/08/2012 16:03	30.49	10				250	WC-Hanford, Inc.	
1208012-04	8082 PCBs	08/08/2012 16:03	30.27	10				250	WC-Hanford, Inc.	
1208012-05	8082 PCBs	08/08/2012 16:03	30.78	10				250	WC-Hanford, Inc.	
L208053-BLK1	QC	08/08/2012 16:03	30	10				250		
L208053-BS1	QC	08/08/2012 16:03	30	10	1200902		250	250		
L208053-MS1	QC	08/08/2012 16:03	30.07	10	1200902	1208012-05	250	250		
L208053-MSD1	QC	08/08/2012 16:03	30.2	10	1200902	1208012-05	250	250		

Scleaned 08.13.12 SZ
Cu lot # G16W031

8/9/12 1425 — Extracts Relinquished By — Date

08.13.12 7:05 — Extracts Received By — Date

DRO/MO

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

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/09/2012 19:20

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PWH5	1208012-01	Soil	08/01/2012 10:00	08/03/2012 10:00
J1PWH6	1208012-02	Soil	08/01/2012 10:05	08/03/2012 10:00
J1PWH7	1208012-03	Soil	08/01/2012 13:05	08/03/2012 10:00
J1PWH8	1208012-04	Soil	08/01/2012 13:10	08/03/2012 10:00
J1PWH9	1208012-05	Soil	08/01/2012 14:15	08/03/2012 10:00

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-029 K3964
LVL #: 1208012

W.O. #: 60049-001-001-0001-00
Date Received: 08-03-2012

DIESEL RANGE ORGANICS

Five (5) soil samples were collected on 08-01-2012.

The samples and associated QC samples were extracted 08-06-2012 and analyzed 08-08-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

Lionville Laboratory (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. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The samples were 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 hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

8/20/12
Date

r:\group\data\2012\dro\wc hanford\1208012oj.doc

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.

GLOSSARY OF DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.
.I	=	Indicates an interference on one analytical column only. Result is reported from remaining analytical column.
P	=	This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

Lionville Laboratory Use Only

1208012

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: W C Hanford SAF# RC-029
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: Std. TAT: 15D-yA

Date Rec'd: 8.3.12 Date Due: 8.18.12

		A		B		C		D		E
Refrigerator #		1		1		1		1		1
#/Type Container	Liquid									
	Solid	1AG		1AG		1AG		1AG		1AG
Volume	Liquid									
	Solid	120		120		60		120		120
Preservatives		–		–		–		–		–
ANALYSES REQUESTED →		ORGANIC				INORG				
		VOA	BNA	Pest/PCB	Herb	HYDRO/PAH		Metal Hg	CN	IC Anions	PH
Lionville Laboratory Use Only				8082		Dro/Mo		Met/Hg		Anions	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	VOA	BNA	Pest/PCB	Herb	HYDRO/PAH			Metal Hg	CN		IC Anions		PH		
01	J1PWH5			SOIL	8-1-12	1000			X		X			X							
02	6					1005			X		X			X							
03	7					1305			X		X			X			X		X		
04	8					1310			X		X			X			X		X		
05	9					1415			X		X			X							

Special Instructions:

① Met = HBL + B, Mo, Si (no TL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	8/3/12	1000

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

000000022

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-145	Page 1 of 1

Collector Q. Stowe	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation Remaining Sites Confirmation Sampling - Soil Full Protocol	Sampling Location 100-D-98:2		SAF No. RC-029
Ice Chest No. RCC-08-027	Field Logbook No. EL-1662-01	COA C10D98A000	Method of Shipment AJ 8-1-12 ~~Hand~~ Fed Ex
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A110479		Bill of Lading/Air Bill No. See OSPC

Price Code 8C

Data Turnaround 15 Days

000000023

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly.

Special Handling and/or Storage

Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	120mL	120mL	120mL	120mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PCBs - 8082	IC Anions 300	pH 9045						

Sample No.	Matrix *	Sample Date	Sample Time										
J1PWH5	SOIL	8/1/12	1000	X	X	X							
J1PWH6	SOIL	8/1/12	1005	X	X	X							
J1PWH7	SOIL	8/1/12	1305	X	X	X	X	X					
J1PWH8	SOIL	8/1/12	1310	X	X	X	X	X					
J1PWH9	SOIL	8/1/12	1415	X	X	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	8/1/12 1445	MZM MSTankovich	8/1/12 1445 WCH
MZM MSTankovich WCH	8-1-12 1535	A. Freier	8-1-12 1535
A. Freier WCH	8-2-12 1060#1 0940	Fed Ex	
Lee Co	8/3/12 1000	Victor Hernandez	8-3-12 1000

SPECIAL INSTRUCTIONS

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

REVIEWED BY JEH DATE 8-2-12

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

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-029

Date: 8/ /12

LvL Batch #: 1208

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7938 6063 2602
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 # RCC-08-027
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

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

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/09/2012 19:20

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PWH5 (1208012-01) Soil								
Surrogate: p-Terphenyl	*82 %*	*39-129*			*L208030*	*08/06/2012*	*08/08/2012*	*8015M*
Diesel Range Organics	3390 U	3390	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
Motor Oil	10200 U	10200	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
J1PWH6 (1208012-02) Soil								
Surrogate: p-Terphenyl	*88 %*	*39-129*			*L208030*	*08/06/2012*	*08/08/2012*	*8015M*
Diesel Range Organics	2080 J	3400	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
Motor Oil	10200 U	10200	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
J1PWH7 (1208012-03) Soil								
Surrogate: p-Terphenyl	*87 %*	*39-129*			*L208030*	*08/06/2012*	*08/08/2012*	*8015M*
Diesel Range Organics	2180 J	3500	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
Motor Oil	10500 U	10500	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
J1PWH8 (1208012-04) Soil								
Surrogate: p-Terphenyl	*82 %*	*39-129*			*L208030*	*08/06/2012*	*08/08/2012*	*8015M*
Diesel Range Organics	2870 J	3430	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
Motor Oil	10300 U	10300	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
J1PWH9 (1208012-05) Soil								
Surrogate: p-Terphenyl	*73 %*	*39-129*			*L208030*	*08/06/2012*	*08/08/2012*	*8015M*
Diesel Range Organics	1020 J	3370	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M
Motor Oil	10100 U	10100	ug/kg dry	1	L208030	08/06/2012	08/08/2012	8015M

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

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/09/2012 19:20

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208030 - SW 3540C									
Blank (L208030-BLK1)			Prepared: 08/06/2012 Analyzed: 08/08/2012						
Diesel Range Organics	1750 J	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*5650*		*ug/kg wet*	*6666.7*		*85*	*39-129*		
LCS (L208030-BS1)			Prepared: 08/06/2012 Analyzed: 08/08/2012						
Diesel Range Organics	49700	3330	ug/kg wet	66667		75	42-133		
Surrogate: p-Terphenyl	*5620*		*ug/kg wet*	*6666.7*		*84*	*39-129*		
Matrix Spike (L208030-MS4)	**Source: 1208012-01**		Prepared: 08/06/2012 Analyzed: 08/08/2012						
Diesel Range Organics	61700	3400	ug/kg dry	68008	3390 U	91	42-133		
Surrogate: p-Terphenyl	*6630*		*ug/kg dry*	*6800.8*		*97*	*39-129*		
Matrix Spike Dup (L208030-MSD4)	**Source: 1208012-01**		Prepared: 08/06/2012 Analyzed: 08/08/2012						
Diesel Range Organics	53600	3380	ug/kg dry	67672	3390 U	79	42-133	14	40
Surrogate: p-Terphenyl	*5660*		*ug/kg dry*	*6767.2*		*84*	*39-129*		

REVISION

PREPARATION BENCH SHEET

L208030

Lionville Laboratory

Printed: 8/8/2012 8:21:01PM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200549**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1208001-01	8015M DRO	08/06/2012 11:11	31.39	1				1000	WC-Hanford, Inc.	
1208001-02	8015M DRO	08/06/2012 11:11	30.22	1				1000	WC-Hanford, Inc.	
1208001-03	8015M DRO	08/06/2012 11:11	30.57	1				1000	WC-Hanford, Inc.	
1208007-01	8015M DRO	08/06/2012 11:11	30.63	1				1000	WC-Hanford, Inc.	
1208008-01	8015M DRO	08/06/2012 11:11	30.49	1				1000	WC-Hanford, Inc.	
1208012-01	8015M DRO	08/06/2012 11:11	30.37	1				1000	WC-Hanford, Inc.	
1208012-02	8015M DRO	08/06/2012 11:11	30.31	1				1000	WC-Hanford, Inc.	
1208012-03	8015M DRO	08/06/2012 11:11	30.17	1				1000	WC-Hanford, Inc.	
1208012-04	8015M DRO	08/06/2012 11:11	30.9	1				1000	WC-Hanford, Inc.	
1208012-05	8015M DRO	08/06/2012 11:11	30.31	1				1000	WC-Hanford, Inc.	
L208030-BLK1	QC	08/06/2012 11:11	30	1				1000		
L208030-BS1	QC	08/06/2012 11:11	30	1	1200846		1000	1000		
L208030-MS1	QC	08/06/2012 11:11	30.6	1	1200846	1208001-01	1000	1000		
L208030-MS2	QC	08/06/2012 11:11	31.07	1	1200846	1208007-01	1000	1000		
L208030-MS3	QC	08/06/2012 11:11	30.72	1	1200846	1208008-01	1000	1000		
L208030-MS4	QC	08/06/2012 11:11	30.28	1	1200846	1208012-01	1000	1000		
L208030-MSD1	QC	08/06/2012 11:11	30.67	1	1200846	1208001-01	1000	1000		
L208030-MSD2	QC	08/06/2012 11:11	30.37	1	1200846	1208007-01	1000	1000		
L208030-MSD3	QC	08/06/2012 11:11	30.19	1	1200846	1208008-01	1000	1000		
L208030-MSD4	QC	08/06/2012 11:11	30.43	1	1200846	1208012-01	1000	1000		

Revision for BS 1b + MMT CAC 8/8/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L208030

Lionville Laboratory

Printed: 8/7/2012 2:40:47PM

000000028

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 1200549

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1208001-01	8015M DRO	08/06/2012 11:11	31.39	1				1000	WC-Hanford, Inc.	
1208001-02	8015M DRO	08/06/2012 11:11	30.22	1				1000	WC-Hanford, Inc.	
1208001-03	8015M DRO	08/06/2012 11:11	30.57	1				1000	WC-Hanford, Inc.	
1208007-01	8015M DRO	08/06/2012 11:11	30.63	1				1000	WC-Hanford, Inc.	
1208008-01	8015M DRO	08/06/2012 11:11	30.49	1				1000	WC-Hanford, Inc.	
1208012-01	8015M DRO	08/06/2012 11:11	30.37	1				1000	WC-Hanford, Inc.	
1208012-02	8015M DRO	08/06/2012 11:11	30.31	1				1000	WC-Hanford, Inc.	
1208012-03	8015M DRO	08/06/2012 11:11	30.17	1				1000	WC-Hanford, Inc.	
1208012-04	8015M DRO	08/06/2012 11:11	30.9	1				1000	WC-Hanford, Inc.	
1208012-05	8015M DRO	08/06/2012 11:11	30.31	1				1000	WC-Hanford, Inc.	
L208030-BLK1	QC	08/06/2012 11:11	30	1				1000		
L208030-BS1	QC	08/06/2012 11:11	30	1				1000		
L208030-MS1	QC	08/06/2012 11:11	30.6	1	1200846	1208001-01	1000	1000		
L208030-MS2	QC	08/06/2012 11:11	31.07	1	1200846	1208007-01	1000	1000		
L208030-MS3	QC	08/06/2012 11:11	30.72	1	1200846	1208008-01	1000	1000		
L208030-MS4	QC	08/06/2012 11:11	30.28	1	1200846	1208012-01	1000	1000		
L208030-MSD1	QC	08/06/2012 11:11	30.67	1	1200846	1208001-01	1000	1000		
L208030-MSD2	QC	08/06/2012 11:11	30.37	1	1200846	1208007-01	1000	1000		
L208030-MSD3	QC	08/06/2012 11:11	30.19	1	1200846	1208008-01	1000	1000		
L208030-MSD4	QC	08/06/2012 11:11	30.43	1	1200846	1208012-01	1000	1000		

Extracts Relinquished By — Date: 8/7/12 1450

Extracts Received By — Date

METALS

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PWH5	1208012-01	Soil	08/01/2012 10:00	08/03/2012 10:00
J1PWH6	1208012-02	Soil	08/01/2012 10:05	08/03/2012 10:00
J1PWH7	1208012-03	Soil	08/01/2012 13:05	08/03/2012 10:00
J1PWH8	1208012-04	Soil	08/01/2012 13:10	08/03/2012 10:00
J1PWH9	1208012-05	Soil	08/01/2012 14:15	08/03/2012 10:00

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-029
LVL#: 1208012
SDG/SAF#: K3964/RC-029

W.O.#: 60049-001-001-0001-00
Date Received: 08-03-12

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 5 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 LvLI'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 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.

10. The matrix spike (MS) recoveries for 16 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 PDS was prepared at meaningful concentration level for the

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.

following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PWH5	Aluminum	22,000	70.2
	Antimony	100	86.9
	Arsenic	100	89.8
	Beryllium	100	86.0
	Boron	100	85.7
	Chromium	100	83.0
	Cobalt	100	84.3
	Iron	22,000	27.2
	Lead	100	81.4
	Manganese	1,000	62.9
	Molybdenum	100	84.6
	Nickel	100	83.4
	Potassium	2,000	95.1
	Selenium	100	88.2
	Silver	100	81.6
	Vanadium	1,000	70.7

12. All duplicate analyses 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.

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

8/20/12
Date

jjw/08-012hg%

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

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-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

J1PWH5
1208012-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**4710**		5.05	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Antimony	0.606	U	0.606	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Arsenic	**1.38**		1.01	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Barium	**47.6**		0.505	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Beryllium	**0.201**	B	0.202	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Boron	**1.03**	B	2.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cadmium	**0.0569**	B	0.202	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Calcium	**5590**		101	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Chromium	**4.96**		0.202	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cobalt	**6.98**		2.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Copper	**12.3**		1.01	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Iron	**21500**		20.2	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Lead	**2.11**		0.505	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Magnesium	**3680**		75.7	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Manganese	**266**		5.05	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Molybdenum	**0.330**	B	2.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Nickel	**6.39**		4.04	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Potassium	**551**		404	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Selenium	0.303	U	0.303	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silicon	**190**		2.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silver	0.202	U	0.202	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Sodium	**442**		50.5	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Vanadium	**64.2**		2.52	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Zinc	**41.4**		10.1	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Mercury	0.0250	U	0.0250	mg/kg dry	1	L208035	08/06/2012	08/08/2012	7471A

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

J1PWH6
1208012-02 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**3900**		4.52	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Antimony	0.543	U	0.543	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Arsenic	**1.20**		0.905	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Barium	**42.8**		0.452	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Beryllium	**0.183**		0.181	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Boron	**0.804**	B	1.81	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cadmium	**0.0509**	B	0.181	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Calcium	**4650**		90.5	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Chromium	**3.47**		0.181	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cobalt	**6.77**		1.81	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Copper	**12.0**		0.905	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Iron	**21200**		18.1	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Lead	**1.80**		0.452	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Magnesium	**3750**		67.9	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Manganese	**256**		4.52	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Molybdenum	**0.406**	B	1.81	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Nickel	**6.69**		3.62	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Potassium	**536**		362	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Selenium	0.271	U	0.271	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silicon	**149**		1.81	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silver	0.181	U	0.181	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Sodium	**368**		45.2	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Vanadium	**63.4**		2.26	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Zinc	**41.3**		9.05	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Mercury	0.0273	U	0.0273	mg/kg dry	1	L208035	08/06/2012	08/08/2012	7471A

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

J1PWH7
1208012-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**4320**		4.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Antimony	0.598	U	0.598	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Arsenic	**1.42**		0.997	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Barium	**50.1**		0.499	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Beryllium	**0.200**		0.199	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Boron	**1.04**	B	1.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cadmium	0.199	U	0.199	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Calcium	**5210**		99.7	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Chromium	**3.25**		0.199	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cobalt	**6.20**		1.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Copper	**12.1**		0.997	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Iron	**21000**		19.9	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Lead	**1.99**		0.499	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Magnesium	**3360**		74.8	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Manganese	**264**		4.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Molybdenum	**0.328**	B	1.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Nickel	**5.35**		3.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Potassium	**531**		399	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Selenium	0.299	U	0.299	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silicon	**160**		1.99	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silver	0.199	U	0.199	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Sodium	**456**		49.9	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Vanadium	**64.2**		2.49	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Zinc	**40.1**		9.97	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Mercury	0.0307	U	0.0307	mg/kg dry	1	L208035	08/06/2012	08/08/2012	7471A

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

J1PWH8
1208012-04 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**4630**		5.09	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Antimony	0.611	U	0.611	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Arsenic	**1.46**		1.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Barium	**54.3**		0.509	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Beryllium	**0.201**	B	0.204	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Boron	**1.79**	B	2.04	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cadmium	**0.0614**	B	0.204	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Calcium	**5640**		102	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Chromium	**5.08**		0.204	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cobalt	**6.73**		2.04	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Copper	**13.7**		1.02	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Iron	**21300**		20.4	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Lead	**2.17**		0.509	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Magnesium	**3840**		76.4	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Manganese	**263**		5.09	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Molybdenum	**0.312**	B	2.04	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Nickel	**8.89**		4.07	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Potassium	**571**		407	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Selenium	0.306	U	0.306	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silicon	**165**		2.04	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silver	0.204	U	0.204	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Sodium	**390**		50.9	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Vanadium	**67.4**		2.55	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Zinc	**42.7**		10.2	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Mercury	0.0308	U	0.0308	mg/kg dry	1	L208035	08/06/2012	08/08/2012	7471A

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

J1PWH9
1208012-05 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**5780**		4.40	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Antimony	0.528	U	0.528	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Arsenic	**3.19**		0.881	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Barium	**50.0**		0.440	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Beryllium	**0.192**		0.176	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Boron	**2.32**		1.76	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cadmium	**0.0957**	B	0.176	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Calcium	**7100**		88.1	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Chromium	**12.0**		0.176	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Cobalt	**3.69**		1.76	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Copper	**9.27**		0.881	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Iron	**12000**		17.6	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Lead	**2.92**		0.440	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Magnesium	**3590**		66.0	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Manganese	**198**		4.40	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Molybdenum	**0.212**	B	1.76	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Nickel	**9.61**		3.52	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Potassium	**976**		352	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Selenium	0.264	U	0.264	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silicon	**189**		1.76	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Silver	0.176	U	0.176	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Sodium	**266**		44.0	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Vanadium	**28.1**		2.20	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Zinc	**26.4**		8.81	mg/kg dry	1	L208077	08/12/2012	08/13/2012	6010B
Mercury	0.0242	U	0.0242	mg/kg dry	1	L208035	08/06/2012	08/08/2012	7471A

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

WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

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 L208035 - SW 7471A Prep										
Blank (L208035-BLK1)				Prepared: 08/06/2012 Analyzed: 08/07/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L208035-DUP3)		**Source: 1208012-01**		Prepared: 08/06/2012 Analyzed: 08/08/2012						
Mercury	0.0273	U	0.0273	mg/kg dry		0.0250 U				20
Matrix Spike (L208035-MS3)		**Source: 1208012-01**		Prepared: 08/06/2012 Analyzed: 08/08/2012						
Mercury	0.165		0.0281	mg/kg dry	0.15601	0.0250 U	106	75-125		
Reference (L208035-SRM1)				Prepared: 08/06/2012 Analyzed: 08/07/2012						
Mercury	1.20		0.0281	mg/kg wet	1.2900		93.1	62.6-138		
Batch L208077 - SW 3050B										
Blank (L208077-BLK1)				Prepared: 08/12/2012 Analyzed: 08/13/2012						
Aluminum	4.63	U	4.63	mg/kg wet						
Antimony	0.556	U	0.556	mg/kg wet						
Arsenic	0.926	U	0.926	mg/kg wet						
Barium	0.463	U	0.463	mg/kg wet						
Beryllium	0.185	U	0.185	mg/kg wet						
Boron	1.85	U	1.85	mg/kg wet						
Cadmium	0.185	U	0.185	mg/kg wet						
Calcium	92.6	U	92.6	mg/kg wet						
Chromium	0.185	U	0.185	mg/kg wet						
Cobalt	1.85	U	1.85	mg/kg wet						
Copper	0.926	U	0.926	mg/kg wet						
Iron	18.5	U	18.5	mg/kg wet						
Lead	0.463	U	0.463	mg/kg wet						
Magnesium	69.4	U	69.4	mg/kg wet						
Manganese	4.63	U	4.63	mg/kg wet						
Molybdenum	1.85	U	1.85	mg/kg wet						
Nickel	3.70	U	3.70	mg/kg wet						
Potassium	370	U	370	mg/kg wet						
Selenium	0.278	U	0.278	mg/kg wet						
Silicon	1.85	U	1.85	mg/kg wet						
Silver	0.185	U	0.185	mg/kg wet						
Sodium	46.3	U	46.3	mg/kg wet						
Vanadium	2.31	U	2.31	mg/kg wet						
Zinc	9.26	U	9.26	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

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 L208077 - SW 3050B										
Duplicate (L208077-DUP3)		**Source: 1208012-01**		Prepared: 08/12/2012 Analyzed: 08/13/2012						
Aluminum	4640		5.05	mg/kg dry		4710			1.49	20
Antimony	0.606	U	0.606	mg/kg dry		0.606 U				20
Arsenic	1.35		1.01	mg/kg dry		1.38			2.51	20
Barium	46.4		0.505	mg/kg dry		47.6			2.62	20
Beryllium	0.189	B	0.202	mg/kg dry		0.201			5.79	20
Boron	0.973	B	2.02	mg/kg dry		1.03			6.10	20
Cadmium	0.0605	B	0.202	mg/kg dry		0.0569			6.09	20
Calcium	5480		101	mg/kg dry		5590			1.99	20
Chromium	5.09		0.202	mg/kg dry		4.96			2.57	20
Cobalt	6.61		2.02	mg/kg dry		6.98			5.45	20
Copper	13.1		1.01	mg/kg dry		12.3			5.65	20
Iron	21200		20.2	mg/kg dry		21500			1.75	20
Lead	2.15		0.505	mg/kg dry		2.11			1.61	20
Magnesium	3650		75.7	mg/kg dry		3680			0.799	20
Manganese	246		5.05	mg/kg dry		266			7.82	20
Molybdenum	0.295	B	2.02	mg/kg dry		0.330			11.2	20
Nickel	7.12		4.04	mg/kg dry		6.39			10.8	20
Potassium	552		404	mg/kg dry		551			0.220	20
Selenium	0.303	U	0.303	mg/kg dry		0.303 U				20
Silicon	162		2.02	mg/kg dry		190			15.8	20
Silver	0.202	U	0.202	mg/kg dry		0.202 U				20
Sodium	441		50.5	mg/kg dry		442			0.137	20
Vanadium	63.8		2.52	mg/kg dry		64.2			0.663	20
Zinc	41.1		10.1	mg/kg dry		41.4			0.587	20
Matrix Spike (L208077-MS3)		**Source: 1208012-01**		Prepared: 08/12/2012 Analyzed: 08/13/2012						
Aluminum	5000		4.95	mg/kg dry	198.01	4710	148*	75-125		
Antimony	18.3		0.594	mg/kg dry	49.502	0.606 U	37.0*	75-125		
Arsenic	144		0.990	mg/kg dry	198.01	1.38	72.1*	75-125		
Barium	197		0.495	mg/kg dry	198.01	47.6	75.6	75-125		
Beryllium	3.63		0.198	mg/kg dry	4.9502	0.201	69.2*	75-125		
Boron	65.8		1.98	mg/kg dry	99.003	1.03	65.4*	75-125		
Cadmium	4.11		0.198	mg/kg dry	4.9502	0.0569	81.8	75-125		
Calcium	7510		99.0	mg/kg dry	2475.1	5590	77.7	75-125		
Chromium	18.6		0.198	mg/kg dry	19.801	4.96	68.8*	75-125		
Cobalt	40.9		1.98	mg/kg dry	49.502	6.98	68.5*	75-125		
Copper	31.0		0.990	mg/kg dry	24.751	12.3	75.5	75-125		

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

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 L208077 - SW 3050B									
Matrix Spike (L208077-MS3)		**Source: 1208012-01**	Prepared: 08/12/2012 Analyzed: 08/13/2012						
Iron	22300	19.8	mg/kg dry	99.003	21500	782*	75-125		
Lead	34.2	0.495	mg/kg dry	49.502	2.11	64.8*	75-125		
Magnesium	5560	74.3	mg/kg dry	2475.1	3680	76.0	75-125		
Manganese	302	4.95	mg/kg dry	49.502	266	74.1*	75-125		
Molybdenum	70.3	1.98	mg/kg dry	99.003	0.330	70.7*	75-125		
Nickel	41.0	3.96	mg/kg dry	49.502	6.39	69.9*	75-125		
Potassium	2340	396	mg/kg dry	2475.1	551	72.3*	75-125		
Selenium	137	0.297	mg/kg dry	198.01	0.303 U	69.1*	75-125		
Silicon	285	1.98	mg/kg dry	99.003	190	96.1	75-125		
Silver	3.47	0.198	mg/kg dry	4.9502	0.202 U	70.1*	75-125		
Sodium	2310	49.5	mg/kg dry	2475.1	442	75.4	75-125		
Vanadium	95.4	2.48	mg/kg dry	49.502	64.2	63.0*	75-125		
Zinc	80.4	9.90	mg/kg dry	49.502	41.4	78.7	75-125		
Reference (L208077-SRM1)			Prepared: 08/12/2012 Analyzed: 08/13/2012						
Aluminum	10700	14.7	mg/kg wet	6670.0		160	0-200.89		
Antimony	37.6	1.76	mg/kg wet	53.000		70.9	0-235.8		
Arsenic	111	2.94	mg/kg wet	114.00		97.8	82.8-117.54		
Barium	294	1.47	mg/kg wet	307.00		95.9	79.8-120.2		
Beryllium	100	0.588	mg/kg wet	108.00		92.9	82.8-117.6		
Boron	77.5	5.88	mg/kg wet	85.100		91.1	67.5-132.8		
Cadmium	215	0.588	mg/kg wet	225.00		95.7	83.6-116.4		
Calcium	3100	294	mg/kg wet	3360.0		92.2	83.3-116.9		
Chromium	79.1	0.588	mg/kg wet	77.200		102	73.3-126.4		
Cobalt	157	5.88	mg/kg wet	166.00		94.5	80.7-118.7		
Copper	258	2.94	mg/kg wet	271.00		95.4	80.8-119.2		
Iron	8090	58.8	mg/kg wet	8420.0		96.1	78.6-121.1		
Lead	184	1.47	mg/kg wet	190.00		96.6	81.6-118.4		
Magnesium	7880	221	mg/kg wet	8570.0		91.9	83.2-116.7		
Manganese	729	14.7	mg/kg wet	965.00		75.6	69.3-130.5		
Molybdenum	228	5.88	mg/kg wet	235.00		97.0	76.2-123.8		
Nickel	215	11.8	mg/kg wet	221.00		97.2	79.6-120.8		
Potassium	13700	1180	mg/kg wet	14400		95.3	81.9-118.1		
Selenium	184	0.882	mg/kg wet	187.00		98.2	75.9-124.6		
Silicon	332	5.88	mg/kg wet	807.00		41.1	0-219.3		
Silver	78.9	0.588	mg/kg wet	83.500		94.4	82.7-117.1		
Sodium	8890	147	mg/kg wet	9730.0		91.4	82.5-117.2		

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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/17/2012 12:53

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 L208077 - SW 3050B									
Reference (L208077-SRM1)			Prepared: 08/12/2012 Analyzed: 08/13/2012						
Vanadium	97.9	7.35	mg/kg wet	98.700		99.2	75.9-123.6		
Zinc	190	29.4	mg/kg wet	199.00		95.5	78.4-121.6		

Lionville Laboratory Use Only

1208012

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: W C Hanford SAF# RC-029
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SW TAT: 15 Days
Date Rec'd: 8.3.12 Date Due: 8.18.12

		A	B	C	D	E
Refrigerator #		1	1	1	1	1
#/Type Container	Liquid					
	Solid	1AG	1AG	1AG	1AG	1AG
Volume	Liquid					
	Solid	120	120	60	120	120
Preservatives		—	—	—	—	—
ANALYSES REQUESTED	ORGANIC: VOA					
	ORGANIC: BNA					
	ORGANIC: Pest/PCB	X				
	ORGANIC: Herb					
	ORGANIC: WTPHD		X			
	INORG: Metal Hg			X		
	INORG: CN					
	IC Anions				X	
	PH					X
Lionville Laboratory Use Only		8082	DRO/MO	Met/Hg	Anions	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	8082	DRO/MO	Met/Hg	Anions	PH
01	J1PWH5			Soil	8-1-12	1000	X	X	X		
02	6					1005	X	X	X		
03	7					1305	X	X	X	X	X
04	8					1310	X	X	X	X	X
05	9					1415	X	X	X		

Special Instructions:
① Met = HBL + B, Mo, Si (no TL)

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

Relinquished by	Received by	Date	Time
Fed Ex	[illegible]	8/3/12	1000

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

00000043

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-029-145	Page 1 of 1

Collector Q. Stowe	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESSNER, JH	Price Code 8C	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Soil Full Protocol	Sampling Location 100-D-98:2		SAF No. RC-029		
Ice Chest No. RCC-08-027	Field Logbook No. EL-1662-01	COA C10D98A000	Method of Shipment AJ 8-1-12 ~~Hac~~ Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A110479		Bill of Lading/Air Bill No. See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

Samples may contain hazardous chemicals at levels that pose a risk to human health and/or the environment. Please handle accordingly.

Special Handling and/or Storage

Please keep cool (4 deg C) those requiring coolness, as shown on "Preservation" heading. Thank You.

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C						
Type of Container	G/P	G	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	60mL	120mL	120mL	120 mL	120 mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PCBs - 8082	IC Anions 300	pH 9045						
Sample No. / Matrix * / Sample Date / Sample Time											
J1PWH5 / SOIL / 8/1/12 / 1000	X	X	X								
J1PWH6 / SOIL / 8/1/12 / 1005	X	X	X								
J1PWH7 / SOIL / 8/1/12 / 1305	X	X	X	X	X						
J1PWH8 / SOIL / 8/1/12 / 1310	X	X	X	X	X						
J1PWH9 / SOIL / 8/1/12 / 1415	X	X	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From Quincy Stowe	Date/Time 1445 8/1/12	Received By/Stored In MZM MSTankovich	Date/Time 1445 WCH 8/1/12
Relinquished By/Removed From MZM MSTankovich	Date/Time WCH 1535 8-1-12	Received By/Stored In A. Freier	Date/Time 1060#1 1535 8-1-12
Relinquished By/Removed From A. Freier	Date/Time WCH 1060#1 8-2-12 0940	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 8/3/12 1000	Received By/Stored In VICTOR HERNANDEZ	Date/Time 8-3-12 1000
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

REVIEWED BY JEB DATE 8-2-12

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

000000044

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford **Date:** 8/ /12

Project/SAF/SOW/Release #: RC-029

LvL Batch #: 1208 **Sample Custodian:** Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7938 6063 2602
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 # RCC-08-027
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 _____

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208077
Date/Time Initiated: 8/10/12 (weighed) 8/12/12 1330
Date/Time Completed: 8/12/12 2035
Analyst: EA
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~~ TEAD 8/10/12
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
1208010-01		0.52	50		TO	OILY	orange oil	NA	NA
01R		0.50	50			OILY	orange oil		
01S	0.5	0.52	50			OILY	orange oil		
1208011-01		0.55	50			fine	Brown sandy		
01R		0.60	50			fine	Brown sandy		
01S	0.5	0.53	50			fine	Brown sandy		
1208012-01		0.51	50			fine	DARK sandy		
01R		0.51	50			fine	~~Brown~~ DARK sandy TEAD 8/10/12		
01S	0.5	0.52	50			fine	DARK sandy		
02		0.57	50			fine	DARK sandy		
03		0.53	50			fine	DARK sandy		
04		0.52	50			fine	DARK sandy		
05		0.58	50			fine	Brown sandy		
1208077-BLK		0.54	50			COARSE	Boiling chips		
1208077-SRM	*	0.51	50			fine	Pink LOAMY		

EA 8/12/12

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:
RLG 8/14/12

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

Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1143

Analyst: UB
Date 8/6/12
Start Time/Temp: 1505 / 94°
End Time/Temp: 1535 / 95°

Instrument ID: HG3.1
Balance # B29 /NA
Pipette Calibration (Daily) Y ✓

Prep Batch: L208035
Worksheet: HG080701
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	
L208035-BLK1				0.31	50	
SRM1		*	*	0.32	50	
1208001-01				0.37	50	
01R				0.36	50	
01S		0.500	1.0	0.36	50	
02				0.36	50	
03				0.36	50	
1208011-01				0.36	50	
01R				0.38	50	
01S		0.500	1.0	0.36	50	
1208012-01				0.37	50	
01R				0.34	50	
01S		0.500	1.0	0.33	50	
02				0.34	50	
03				0.31	50	
04				0.31	50	
05				0.38	50	
		ZEB 8/6/12				

Standard:	ID	Prep Date/Time
ICAL/MS	R1 1200588	8/6/12 1130
ICV/CCV/LCS	IV 1200532	NA

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

se book # 9368 for std traceability information

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

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

WET CHEMISTRY

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-029	
2620 Fermi Avenue	Project Number: K3964	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/20/2012 17:32

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PWH5	1208012-01	Soil	08/01/2012 10:00	08/03/2012 10:00
J1PWH6	1208012-02	Soil	08/01/2012 10:05	08/03/2012 10:00
J1PWH7	1208012-03	Soil	08/01/2012 13:05	08/03/2012 10:00
J1PWH8	1208012-04	Soil	08/01/2012 13:10	08/03/2012 10:00
J1PWH9	1208012-05	Soil	08/01/2012 14:15	08/03/2012 10:00

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Case Narrative

Client: WC-HANFORD RC-029 K3964
LVL#: 1208012 **Date Received:** 08-03-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 5 soil sample.

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.

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 with the exception of Sulfate at 146% and 147% that may be attributed to sample inhomogeneity.

8. The replicate analysie were within the 20% Relative Percent Difference (RPD) control limit with the exception of Sulfate at 45.0% that may be attributed to sample inhomogeneity.

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

8/20/12
Date

njp\i08-012

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.

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Notes and Definitions

U	Analyte included in the analysis, but not detected
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
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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Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PWH5 (1208012-01) Soil										
%Solids	**97.1**			0.1	% by Weight	1	L208041	08/06/2012	08/06/2012	SM2540G
J1PWH6 (1208012-02) Soil										
%Solids	**96.9**			0.1	% by Weight	1	L208041	08/06/2012	08/06/2012	SM2540G
J1PWH7 (1208012-03) Soil										
%Solids	**94.6**			0.1	% by Weight	1	L208041	08/06/2012	08/06/2012	SM2540G
Bromide	1.0	U	1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Chloride	1.0	U	1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Fluoride	**1.2**	B	1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Nitrate	**2.3**	B	1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Orthophosphate	**2.2**	B	2.1	10.3	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Sulfate	**15.7**		1.0	5.1	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
pH	**9.62**		0.10	0.10	pH Units	1	L208085	08/13/2012	08/13/2012	SW846 9045D
J1PWH8 (1208012-04) Soil										
%Solids	**94.4**			0.1	% by Weight	1	L208041	08/06/2012	08/06/2012	SM2540G
Bromide	1.0	U	1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Chloride	1.0	U	1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Fluoride	**1.4**	B	1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Nitrate	**2.8**	B	1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Orthophosphate	2.0	U	2.0	9.9	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
Sulfate	**28.0**		1.0	5.0	mg/kg dry	1	L208144	08/16/2012	08/16/2012	EPA 300.0 (1993)
pH	**9.45**		0.10	0.10	pH Units	1	L208085	08/13/2012	08/13/2012	SW846 9045D

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Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PWH9 (1208012-05) Soil									
%Solids	**97.9**		0.1	% by Weight	1	L208041	08/06/2012	08/06/2012	SM2540G

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-029 Project Number: K3964 Project Manager: Joan Kessner	**Reported:** 08/20/2012 17:32

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208041 - % Solids										
Duplicate (L208041-DUP4)		**Source: 1208012-01**		Prepared & Analyzed: 08/06/2012						
%Solids	96.9		0.1	% by Weight		97.1			0.2	20
Batch L208085 - Default Prep GenChem										
Duplicate (L208085-DUP4)		**Source: 1208012-03**		Prepared & Analyzed: 08/13/2012						
pH	9.64	0.10	0.10	pH Units		9.62			0.208	20
Reference (L208085-SRM1)				Prepared & Analyzed: 08/13/2012						
pH	4.05	0.10	0.10	pH Units	4.0000		101	99-101		
Batch L208144 - Default Prep GenChem										
Blank (L208144-BLK1)				Prepared & Analyzed: 08/16/2012						
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 (L208144-BS1)				Prepared & Analyzed: 08/16/2012						
Fluoride	49.6	1.0	5.0	mg/kg wet	50.000		99.2	80-120		
Chloride	47.1	1.0	5.0	mg/kg wet	50.000		94.2	80-120		
Bromide	48.1	1.0	5.0	mg/kg wet	50.000		96.2	80-120		
Orthophosphate	46.9	2.0	10.0	mg/kg wet	50.000		93.8	80-120		
Sulfate	48.4	1.0	5.0	mg/kg wet	50.000		96.8	80-120		
Nitrate	47.9	1.0	5.0	mg/kg wet	50.000		95.8	80-120		
Nitrite	48.2	1.0	5.0	mg/kg wet	50.000		96.4	80-120		

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Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L208144 - Default Prep GenChem										
Duplicate (L208144-DUP4)	**Source: 1208012-03**			Prepared & Analyzed: 08/16/2012						
Fluoride	1.0 B	1.0	5.1	mg/kg dry		1.2			17.8	20
Chloride	1.0 U	1.0	5.1	mg/kg dry		1.0 U				20
Bromide	1.0 U	1.0	5.1	mg/kg dry		1.0 U				20
Orthophosphate	2.1 U	2.1	10.3	mg/kg dry		2.2				20
Sulfate	24.8	1.0	5.1	mg/kg dry		15.7			45.0*	20
Nitrate	2.5	1.0	5.1	mg/kg dry		2.3			9.05	20
Nitrite	1.0 U	1.0	5.1	mg/kg dry		1.0 U				20
Matrix Spike (L208144-MS4)	**Source: 1208012-03**			Prepared & Analyzed: 08/16/2012						
Fluoride	52.6	1.0	5.1	mg/kg dry	51.212	1.2	100	75-125		
Chloride	49.6	1.0	5.1	mg/kg dry	51.212	1.0 U	96.8	75-125		
Bromide	50.4	1.0	5.1	mg/kg dry	51.212	1.0 U	98.4	75-125		
Orthophosphate	49.3	2.0	10.2	mg/kg dry	51.212	2.2	92.0	75-125		
Sulfate	90.6	1.0	5.1	mg/kg dry	51.212	15.7	146*	75-125		
Nitrate	52.9	1.0	5.1	mg/kg dry	51.212	2.3	98.8	75-125		
Nitrite	50.6	1.0	5.1	mg/kg dry	51.212	1.0 U	98.8	75-125		
Batch L208152 - Default Prep GenChem										
Blank (L208152-BLK1)				Prepared: 08/16/2012 Analyzed: 08/17/2012						
Sulfate	1.0 U	1.0	5.0	mg/kg wet						
LCS (L208152-BS1)				Prepared: 08/16/2012 Analyzed: 08/17/2012						
Sulfate	48.4	1.0	5.0	mg/kg wet	50.000		96.8	80-120		
Matrix Spike (L208152-MS2)	**Source: 1208012-03RE1**			Prepared: 08/16/2012 Analyzed: 08/17/2012						
Sulfate	91.0	1.0	5.1	mg/kg dry	51.212	15.7	147*	75-125		