SAF-RC-189
100N Field Remediation –
Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 7/24/12
INITIAL/DATE

COMMENTS:

SDG K3938 SAF-RC-189

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: UPR-100-N-36 Verification Sample – Lab Split

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

2 July 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 #	1206071
SDG #	K3938
SAF #	RC-189
Date Received	06/22/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
PAHs	X
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 71 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1206071

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-189
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Arlette
QC: SN Del: Std TAT: 21 days
Date Rec'd: 06-22-12 Date Due: 07-13-12

		A		B	C	(B)	D		(D)
Refrigerator #		2		2	2		2		
#/Type Container	Liquid								
	Solid	1aql		1aql	1aql	1 aql	1aql		1
Volume	Liquid								
	Solid	120		250	120		120		
Preservatives		–		–	–		–		

ANALYSES REQUESTED →

ORGANIC							INORG			
VOA	BNA	Pest/PCB	Herb	PCBs	TPH-D	PAHs 8310	Metal + Hg	CN	IC Anions	pH

Lionville Laboratory Use Only

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected			8081 PEST		8082 PCB	DRO/MO	8310 PAH	METALS		ANIONS N-3 NO2	pH				
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	J1PT97	✓	✓	S	6-19-12	0716			X		X	X	X	X		X	X				

Special Instructions:

METALS = HSL + B, Mo, Si (NO TL)

Special Instructions:

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

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	6-22-12	10:10

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-189-081	Page 1 of 1

Collector Q. Stowe	**Company Contact** Joan Kessner **Telephone No.** 375-4688	**Project Coordinator** KESSNER, JH	**Price Code** 8L **Data Turnaround** 21 Days
Project Designation 100N Field Remediation - Soil Full Protocol	**Sampling Location** UPR-100-N-36 Verification Sample-Lab Split	**SAF No.** RC-189	
Ice Chest No. WCH-11-008	**Field Logbook No.** EI-1652-06 **COA** RUP136N6W0	**Method of Shipment** ~~Hand Deliver~~ / Fed Ex AJ 6/19/12	
Shipped To ~~EBERLINE SERVICES~~ / LIONVILLE AJ 6/19/12	**Offsite Property No.** A110 394 372 6-20-12 cm	**Bill of Lading/Air Bill No.** See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential~~ Radioactivity LDOT Limits AJ 6-19-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C				
Type of Container	G/P	G/P	G	aG	aG	aG				
No. of Container(s)	1	0	1	1	0	1				
Volume	120mL	120mL	120mL	250mL	250mL	120mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	TPH-Diesel Range - WTPH-D +	PCBs - 8082	PAHs - 8310	Pesticides - 8081	RCF	32853		

Sample No.	Matrix *	Sample Date	Sample Time										
J1PT97	SOIL	6-19-12	0716	X	X	X	X	X	X				

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Quincy Stowe	0852 6/19/12	Dennis Newman	0852 6/19/12
Dennis Newman	1412 6/19/12	Cindy Bingham	1060#2 6-19-12 1412
Cindy Bingham	1060#2 WCH 6-20-12 1045	Fed Ex	
Fed Ex	6-22-12 10:10		6-22-12 10:10

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)
(2) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2; pH (Soil) - 9045

REVIEWED BY AJ DATE 6-20-12

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

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

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAF/SDW/Release #: RC-189

Date: 6.22.12

LvL Batch #: 1206071

Sample Custodian: D. [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7985 3343 1600
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 5.7	°C	Cooler # WCH-11-008
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 (5) *	☑ No	
Short holds taken to wet lab?	☐ Yes 6/22/12	☐ No	☑ N/A NO_2, NO_3, PO_4 rec'd past hold
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 Q Johnson		Date 6/22/12	

SR-002-B.doc

PESTICIDES

LIONVILLE LABORATORY
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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/30/2012 09:00

Analytical Report for Organochlorine Pesticides by SW846 8081A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-189 K3938
LVL #: 1206071

W.O. #: 60049-001-001-0001-00
Date Received: 06-22-2012

CHLORINATED PESTICIDES

One (1) soil sample was collected on 06-19-2012.

The sample and associated QC samples were extracted 06-27-2012 and analyzed 06-28-2012 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 8081A for client specified target compounds. The sample received Copper-Sulfur cleanup based on SW846 method 3660A.

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 a sample that met LvL's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. One (1) of ten (10) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC100) has been enclosed.

4. The method blank was below the contract required reporting limits for all target compounds.

5. All blank spike recoveries were within acceptance criteria.

6. Two (2) of forty (40) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC100) has been enclosed.

7. All samples required instrument dilutions due to the nature of the matrix. The samples B28NW8 and associated MS/MSD required a 4-fold instrument dilution. Reporting limits have been adjusted to reflect the necessary dilutions.

8. The sample was reported on a dry weight basis.

9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

for Carol Schenkel
Iain Daniels
LvL Laboratory Manager

7/2/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC100

Initiator: Catherine Carey
Date: 06/30/12
Client: WC Hanford

Batch: 12060711
Samples: 01 (J1PT97)
Method: SW846/MCAWW/CLP/ MS04

Parameter: Pest
Matrix: Soil
Prep Batch: L206221

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

TCX Recovery is low in sample H01 (12.5%)

Aldrin and Endrin aldehyde are low in ms04
(69.5%) (48.5%)

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: Carol Schendel for OJ 7/2/12

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: JES 7/2/12 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
✓ Lab Manager: Daniels
✓ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-189 Project Number: K3938 Project Manager: Joan Kessner	**Reported:** 06/30/2012 09:00

J1PT97
1206071-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Organochlorine Pesticides by SW846 8081A									
alpha-BHC	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
gamma-BHC	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
beta-BHC	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
delta-BHC	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Heptachlor	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Aldrin	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Heptachlor epoxide	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
gamma-Chlordane	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
alpha-Chlordane	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endosulfan I	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
4,4'-DDE	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Dieldrin	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endrin	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
4,4'-DDD	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endosulfan II	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
4,4'-DDT	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endrin aldehyde	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endosulfan sulfate	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Methoxychlor	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Endrin ketone	0.333	U	0.333	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Toxaphene	3.33	U	3.33	ug/kg dry	1	L206221	06/27/2012	06/28/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*12.5 % **		*28-166*			*L206221*	*06/27/2012*	*06/28/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*37.3 %*		*37-153*			*L206221*	*06/27/2012*	*06/28/2012*	*8081A*

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/30/2012 09:00

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206221 - SW 3540C										
Blank (L206221-BLK1)				Prepared: 06/27/2012 Analyzed: 06/28/2012						
alpha-BHC	0.330	U	0.330	ug/kg wet						
gamma-BHC	0.330	U	0.330	ug/kg wet						
beta-BHC	0.330	U	0.330	ug/kg wet						
delta-BHC	0.330	U	0.330	ug/kg wet						
Heptachlor	0.330	U	0.330	ug/kg wet						
Aldrin	0.330	U	0.330	ug/kg wet						
Heptachlor epoxide	0.330	U	0.330	ug/kg wet						
gamma-Chlordane	0.330	U	0.330	ug/kg wet						
alpha-Chlordane	0.330	U	0.330	ug/kg wet						
Endosulfan I	0.330	U	0.330	ug/kg wet						
4,4'-DDE	0.330	U	0.330	ug/kg wet						
Dieldrin	0.330	U	0.330	ug/kg wet						
Endrin	0.330	U	0.330	ug/kg wet						
4,4'-DDD	0.330	U	0.330	ug/kg wet						
Endosulfan II	0.330	U	0.330	ug/kg wet						
4,4'-DDT	0.330	U	0.330	ug/kg wet						
Endrin aldehyde	0.330	U	0.330	ug/kg wet						
Endosulfan sulfate	0.330	U	0.330	ug/kg wet						
Methoxychlor	0.330	U	0.330	ug/kg wet						
Endrin ketone	0.330	U	0.330	ug/kg wet						
Toxaphene	3.30	U	3.30	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*33.3*			*ug/kg wet*	*33.337*		*100*	*28-166*		
Surrogate: Decachlorobiphenyl	*29.6*			*ug/kg wet*	*33.333*		*88.7*	*37-153*		
LCS (L206221-BS1)				Prepared: 06/27/2012 Analyzed: 06/28/2012						
alpha-BHC	37.2		0.330	ug/kg wet	33.333		112	65-145		
gamma-BHC	36.7		0.330	ug/kg wet	33.333		110	70-143		
beta-BHC	35.8		0.330	ug/kg wet	33.333		107	75-143		
delta-BHC	34.7		0.330	ug/kg wet	33.333		104	65-143		
Heptachlor	35.9		0.330	ug/kg wet	33.333		108	70-139		
Aldrin	34.7		0.330	ug/kg wet	33.333		104	70-143		
Heptachlor epoxide	33.0		0.330	ug/kg wet	33.333		99.1	71-138		
gamma-Chlordane	34.5		0.330	ug/kg wet	33.333		103	71-137		
alpha-Chlordane	33.7		0.330	ug/kg wet	33.333		101	72-136		
Endosulfan I	32.8		0.330	ug/kg wet	33.333		98.4	72-139		
4,4'-DDE	36.3		0.330	ug/kg wet	33.333		109	70-154		
Dieldrin	34.1		0.330	ug/kg wet	33.333		102	73-143		

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/30/2012 09:00

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206221 - SW 3540C									
LCS (L206221-BS1)			Prepared: 06/27/2012 Analyzed: 06/28/2012						
Endrin	32.9	0.330	ug/kg wet	33.333		98.8	74-137		
4,4'-DDD	36.3	0.330	ug/kg wet	33.333		109	52-153		
Endosulfan II	32.7	0.330	ug/kg wet	33.333		98.0	72-139		
4,4'-DDT	33.5	0.330	ug/kg wet	33.333		101	58-148		
Endrin aldehyde	28.9	0.330	ug/kg wet	33.333		86.8	49-129		
Endosulfan sulfate	31.1	0.330	ug/kg wet	33.333		93.2	66-139		
Methoxychlor	32.5	0.330	ug/kg wet	33.333		97.4	50-144		
Endrin ketone	31.5	0.330	ug/kg wet	33.333		94.4	70-139		
Surrogate: Tetrachloro-meta-xylene	*32.3*		*ug/kg wet*	*33.337*		*96.8*	*28-166*		
Surrogate: Decachlorobiphenyl	*27.5*		*ug/kg wet*	*33.333*		*82.5*	*37-153*		
Matrix Spike (L206221-MS4)		**Source: 1206071-01**	Prepared: 06/27/2012 Analyzed: 06/28/2012						
alpha-BHC	34.4	0.333	ug/kg dry	33.653	0.333 U	102	65-145		
gamma-BHC	33.9	0.333	ug/kg dry	33.653	0.333 U	101	70-143		
beta-BHC	33.2	0.333	ug/kg dry	33.653	0.333 U	98.7	75-143		
delta-BHC	32.4	0.333	ug/kg dry	33.653	0.333 U	96.2	65-143		
Heptachlor	34.5	0.333	ug/kg dry	33.653	0.333 U	103	70-139		
Aldrin	32.4	0.333	ug/kg dry	33.653	0.333 U	96.3	70-143		
Heptachlor epoxide	31.2	0.333	ug/kg dry	33.653	0.333 U	92.7	71-138		
gamma-Chlordane	32.2	0.333	ug/kg dry	33.653	0.333 U	95.6	71-137		
alpha-Chlordane	31.4	0.333	ug/kg dry	33.653	0.333 U	93.3	72-136		
Endosulfan I	31.3	0.333	ug/kg dry	33.653	0.333 U	93.0	72-139		
4,4'-DDE	33.8	0.333	ug/kg dry	33.653	0.333 U	100	70-154		
Dieldrin	32.0	0.333	ug/kg dry	33.653	0.333 U	95.2	73-143		
Endrin	31.6	0.333	ug/kg dry	33.653	0.333 U	94.0	74-137		
4,4'-DDD	33.3	0.333	ug/kg dry	33.653	0.333 U	98.9	52-153		
Endosulfan II	31.0	0.333	ug/kg dry	33.653	0.333 U	92.0	72-139		
4,4'-DDT	32.7	0.333	ug/kg dry	33.653	0.333 U	97.1	58-148		
Endrin aldehyde	26.1	0.333	ug/kg dry	33.653	0.333 U	77.7	49-129		
Endosulfan sulfate	29.9	0.333	ug/kg dry	33.653	0.333 U	88.7	66-139		
Methoxychlor	31.5	0.333	ug/kg dry	33.653	0.333 U	93.5	50-144		
Endrin ketone	30.3	0.333	ug/kg dry	33.653	0.333 U	90.0	70-139		
Surrogate: Tetrachloro-meta-xylene	*30.0*		*ug/kg dry*	*33.656*		*89.2*	*28-166*		
Surrogate: Decachlorobiphenyl	*26.1*		*ug/kg dry*	*33.653*		*77.7*	*37-153*		

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/30/2012 09:00

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206221 - SW 3540C									
Matrix Spike Dup (L206221-MSD4)	**Source: 1206071-01**	Prepared: 06/27/2012 Analyzed: 06/28/2012							
alpha-BHC	27.2	0.329	ug/kg dry	33.202	0.333 U	82.0	65-145	21.8	40
gamma-BHC	26.8	0.329	ug/kg dry	33.202	0.333 U	80.8	70-143	21.8	40
beta-BHC	27.0	0.329	ug/kg dry	33.202	0.333 U	81.2	75-143	19.5	40
delta-BHC	25.1	0.329	ug/kg dry	33.202	0.333 U	75.6	65-143	24.0	40
Heptachlor	27.1	0.329	ug/kg dry	33.202	0.333 U	81.5	70-139	22.9	40
Aldrin	23.1	0.329	ug/kg dry	33.202	0.333 U	69.5*	70-143	32.3	40
Heptachlor epoxide	24.4	0.329	ug/kg dry	33.202	0.333 U	73.4	71-138	23.2	40
gamma-Chlordane	24.9	0.329	ug/kg dry	33.202	0.333 U	75.0	71-137	24.2	40
alpha-Chlordane	24.9	0.329	ug/kg dry	33.202	0.333 U	75.1	72-136	21.6	40
Endosulfan I	24.2	0.329	ug/kg dry	33.202	0.333 U	73.0	72-139	24.1	40
4,4'-DDE	27.1	0.329	ug/kg dry	33.202	0.333 U	81.7	70-154	20.6	40
Dieldrin	25.6	0.329	ug/kg dry	33.202	0.333 U	77.0	73-143	21.1	40
Endrin	25.0	0.329	ug/kg dry	33.202	0.333 U	75.4	74-137	22.0	40
4,4'-DDD	29.2	0.329	ug/kg dry	33.202	0.333 U	87.8	52-153	11.9	40
Endosulfan II	25.5	0.329	ug/kg dry	33.202	0.333 U	76.7	72-139	18.1	40
4,4'-DDT	24.5	0.329	ug/kg dry	33.202	0.333 U	73.8	58-148	27.3	40
Endrin aldehyde	16.1	0.329	ug/kg dry	33.202	0.333 U	48.5*	49-129	46.3*	40
Endosulfan sulfate	25.0	0.329	ug/kg dry	33.202	0.333 U	75.2	66-139	16.5	40
Methoxychlor	26.1	0.329	ug/kg dry	33.202	0.333 U	78.7	50-144	17.2	40
Endrin ketone	25.8	0.329	ug/kg dry	33.202	0.333 U	77.8	70-139	14.5	40
Surrogate: Tetrachloro-meta-xylene	*23.8*		*ug/kg dry*	*33.205*		*71.6*	*28-166*		
Surrogate: Decachlorobiphenyl	*21.9*		*ug/kg dry*	*33.202*		*66.1*	*37-153*		

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

000000016

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
1206058-01	8081A TCL Pesticides	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206058-01	8082 PCBs	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206058-02	8081A TCL Pesticides	06/27/2012 13:35	30.26	10				250	WC-Hanford, Inc.	
1206058-02	8082 PCBs	06/27/2012 13:35	30.26	10				250	WC-Hanford, Inc.	
~~1206068-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.45~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206068-01	8082 PCBs	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206068-02	8082 PCBs	06/27/2012 13:35	30.1	10				250	WC-Hanford, Inc.	
1206071-01	8081A TCL Pesticides	06/27/2012 13:35	30.14	10				250	WC-Hanford, Inc.	
1206071-01	8082 PCBs	06/27/2012 13:35	30.14	10				250	WC-Hanford, Inc.	
~~1206072-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.22~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206072-01	8082 PCBs	06/27/2012 13:35	30.22	10				250	WC-Hanford, Inc.	
~~1206075-02~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.42~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206075-02	8082 PCBs	06/27/2012 13:35	30.42	10				250	WC-Hanford, Inc.	
1206075-03	8082 PCBs	06/27/2012 13:35	30.59	10				250	WC-Hanford, Inc.	
1206075-04	8082 PCBs	06/27/2012 13:35	30.01	10				250	WC-Hanford, Inc.	
~~1206076-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.18~~	~~10~~		VOID		~~250~~	~~Fluor-B&W Portsmouth~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206076-01	8082 PCBs	06/27/2012 13:35	30.18	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-02	8082 PCBs	06/27/2012 13:35	30.8	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-03	8082 PCBs	06/27/2012 13:35	30.22	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-04	8082 PCBs	06/27/2012 13:35	30.43	10				250	Fluor-B&W Portsmouth	Report wet weight

S cleanup Cu lot G16W031

Extracts Relinquished By 6/28/12 1440 Date

Extracts Received By 06.28.12 14:10 Date

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

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
1206076-05	8082 PCBs	06/27/2012 13:35	30.71	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-06	8082 PCBs	06/27/2012 13:35	30.64	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-07	8082 PCBs	06/27/2012 13:35	30.89	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-08	8082 PCBs	06/27/2012 13:35	30.41	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-09	8082 PCBs	06/27/2012 13:35	30.19	10				250	Fluor-B&W Portsmouth	Report wet weight
L206221-BLK1	QC	06/27/2012 13:35	30	10				250		PEST
L206221-BLK2	QC	06/27/2012 13:35	30	10				250		PCB
L206221-BS1	QC	06/27/2012 13:35	30	10	1200281		250	250		PEST
L206221-BS2	QC	06/27/2012 13:35	30	10	1200123		250	250		PCB
L206221-MS1	QC	06/27/2012 13:35	30.7	10	1200281	1206058-01	250	250		Pest
L206221-MS2	QC	06/27/2012 13:35	30.6	10	1200123	1206058-01	250	250		PCB
L206221-MS3	QC	06/27/2012 13:35	30.09	10	1200123	1206068-01	250	250		PCB
L206221-MS4	QC	06/27/2012 13:35	30.17	10	1200281	1206071-01	250	250		PEST
L206221-MS5	QC	06/27/2012 13:35	30.1	10	1200123	1206071-01	250	250		PCB
L206221-MS6	QC	06/27/2012 13:35	30.23	10	1200123	1206072-01	250	250		PCB
L206221-MS7	QC	06/27/2012 13:35	30.11	10	1200123	1206075-02	250	250		PCB
L206221-MS8	QC	06/27/2012 13:35	30.03	10	1200123	1206076-01	250	250		PCB
L206221-MSD1	QC	06/27/2012 13:35	30.51	10	1200281	1206058-01	250	250		Pest
L206221-MSD2	QC	06/27/2012 13:35	30.51	10	1200123	1206058-01	250	250		PCB
L206221-MSD3	QC	06/27/2012 13:35	30.46	10	1200123	1206068-01	250	250		PCB

S cleaned Cu lot 616W031

6/28/12 1410 — Extracts Relinquished By — Date

06.28.12 14.10 — Extracts Received By — Date

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

000000018

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
L206221-MSD4	QC	06/27/2012 13:35	30.58	10	1200281	1206071-01	250	250		PEST
L206221-MSD5	QC	06/27/2012 13:35	30.7	10	1200123	1206071-01	250	250		PCB
L206221-MSD6	QC	06/27/2012 13:35	30.83	10	1200123	1206072-01	250	250		PCB
L206221-MSD7	QC	06/27/2012 13:35	30.15	10	1200123	1206075-02	250	250		PCB
L206221-MSD8	QC	06/27/2012 13:35	30.07	10	1200123	1206076-01	250	250		PCB

S cleaned
Cu lot G160031

6/28/12 1410 S Zak 06.28.12 14.10

Extracts Relinquished By Date Extracts Received By Date

PCBS

LIONVILLE LABORATORY
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Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/10/2012 21:24

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-189 K3938
LVL #: 1206071

W.O. #: 60049-001-001-0001-00
Received: 06-22-2012

PCBs

One (1) soil sample was collected on 06-19-2012.

The sample and associated QC samples were extracted 06-27-2012, 07-06-2012 and analyzed 06-29-2012, 07-09-2012 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 a sample that met LvL's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. Two (2) of twenty (20) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC103) has been enclosed.

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 sample was reported on a dry weight basis.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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.

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.

for

Iain Daniels
LvL Laboratory Manager

7/17/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC103

Initiator: Svethong Zak
Date: 07.02.12
Client: WC Hanford

Batch: 1206071
Samples: 01
Method: SW846/MCAWW/CLP/

Parameter: PCB
Matrix: soil
Prep Batch: L206221

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code ✓ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Low surrogate recoveries:
TCX = 12.5% [52-141]
DCB = 29.2% [43-144]

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
X Re-extract w/matrix QC
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description: re-extract sample w/matrix QC

4. Project Manager Instructions...signature/date: 7/2/12

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 7/13/12 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
1 Project Mgr (circle): Johnson / Stone
2 Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
3 GC/LC: Carey / Zak
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

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-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/17/2012 12:48

J1PT97
1206071-01RE2 (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	L207029	07/06/2012	07/09/2012	8082
Aroclor 1221	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1232	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1242	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1248	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1254	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1260	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1262	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Aroclor 1268	13.2	U	13.2	ug/kg dry	1	L207029	07/06/2012	07/09/2012	8082
Surrogate: Decachlorobiphenyl	*86 %*		*43-144*			*L207029*	*07/06/2012*	*07/09/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*80 %*		*52-141*			*L207029*	*07/06/2012*	*07/09/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/17/2012 12:48

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 L207029 - SW 3540C										
Blank (L207029-BLK1)				Prepared: 07/06/2012 Analyzed: 07/09/2012						
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	*37.4*			*ug/kg wet*	*33.333*		*112*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.4*			*ug/kg wet*	*33.337*		*103*	*52-141*		
LCS (L207029-BS1)				Prepared: 07/06/2012 Analyzed: 07/09/2012						
Aroclor 1016	141		13.3	ug/kg wet	166.67		85	50-138		
Aroclor 1260	165		13.3	ug/kg wet	166.67		99	50-148		
Surrogate: Decachlorobiphenyl	*37.0*			*ug/kg wet*	*33.333*		*111*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.8*			*ug/kg wet*	*33.337*		*101*	*52-141*		
Matrix Spike (L207029-MS1)		**Source: 1206071-01RE2**		Prepared: 07/06/2012 Analyzed: 07/09/2012						
Aroclor 1016	151		13.5	ug/kg dry	169.22	13.2 U	89	50-138		
Aroclor 1260	170		13.5	ug/kg dry	169.22	13.2 U	100	50-148		
Surrogate: Decachlorobiphenyl	*37.7*			*ug/kg dry*	*33.844*		*111*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*36.2*			*ug/kg dry*	*33.847*		*107*	*52-141*		
Matrix Spike Dup (L207029-MSD1)		**Source: 1206071-01RE2**		Prepared: 07/06/2012 Analyzed: 07/09/2012						
Aroclor 1016	131		13.2	ug/kg dry	165.52	13.2 U	79	50-138	12	40
Aroclor 1260	160		13.2	ug/kg dry	165.52	13.2 U	96	50-148	4	40
Surrogate: Decachlorobiphenyl	*37.5*			*ug/kg dry*	*33.104*		*113*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*30.8*			*ug/kg dry*	*33.108*		*93*	*52-141*		

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

000000027

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
1206058-01	8081A TCL Pesticides	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206058-01	8082 PCBs	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206058-02	8081A TCL Pesticides	06/27/2012 13:35	30.26	10				250	WC-Hanford, Inc.	
1206058-02	8082 PCBs	06/27/2012 13:35	30.26	10				250	WC-Hanford, Inc.	
~~1206068-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.45~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206068-01	8082 PCBs	06/27/2012 13:35	30.45	10				250	WC-Hanford, Inc.	
1206068-02	8082 PCBs	06/27/2012 13:35	30.1	10				250	WC-Hanford, Inc.	
1206071-01	8081A TCL Pesticides	06/27/2012 13:35	30.14	10				250	WC-Hanford, Inc.	
1206071-01	8082 PCBs	06/27/2012 13:35	30.14	10				250	WC-Hanford, Inc.	
~~1206072-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.22~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206072-01	8082 PCBs	06/27/2012 13:35	30.22	10				250	WC-Hanford, Inc.	
~~1206075-02~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.42~~	~~10~~		VOID		~~250~~	~~WC-Hanford, Inc.~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206075-02	8082 PCBs	06/27/2012 13:35	30.42	10				250	WC-Hanford, Inc.	
1206075-03	8082 PCBs	06/27/2012 13:35	30.59	10				250	WC-Hanford, Inc.	
1206075-04	8082 PCBs	06/27/2012 13:35	30.01	10				250	WC-Hanford, Inc.	
~~1206076-01~~	~~8081A TCL Pesticides~~ VOID	~~06/27/2012 13:35~~	~~30.18~~	~~10~~		VOID		~~250~~	~~Fluor-B&W Portsmouth~~ 6/28/12	~~Added for BatchQC in: L206221~~
1206076-01	8082 PCBs	06/27/2012 13:35	30.18	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-02	8082 PCBs	06/27/2012 13:35	30.8	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-03	8082 PCBs	06/27/2012 13:35	30.22	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-04	8082 PCBs	06/27/2012 13:35	30.43	10				250	Fluor-B&W Portsmouth	Report wet weight

~~Cu~~ S cleaned Cu lot G16W031

Extracts Relinquished By 6/28/12 1410 Date

Extracts Received By 06.28.12 14:00 Date

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

000000028

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
1206076-05	8082 PCBs	06/27/2012 13:35	30.71	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-06	8082 PCBs	06/27/2012 13:35	30.64	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-07	8082 PCBs	06/27/2012 13:35	30.89	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-08	8082 PCBs	06/27/2012 13:35	30.41	10				250	Fluor-B&W Portsmouth	Report wet weight
1206076-09	8082 PCBs	06/27/2012 13:35	30.19	10				250	Fluor-B&W Portsmouth	Report wet weight
L206221-BLK1	QC	06/27/2012 13:35	30	10				250		PEST
L206221-BLK2	QC	06/27/2012 13:35	30	10				250		PCB
L206221-BS1	QC	06/27/2012 13:35	30	10	1200281		250	250		PEST
L206221-BS2	QC	06/27/2012 13:35	30	10	1200123		250	250		PCB
L206221-MS1	QC	06/27/2012 13:35	30.7	10	1200281	1206058-01	250	250		Pest
L206221-MS2	QC	06/27/2012 13:35	30.6	10	1200123	1206058-01	250	250		PCB
L206221-MS3	QC	06/27/2012 13:35	30.09	10	1200123	1206068-01	250	250		PCB
L206221-MS4	QC	06/27/2012 13:35	30.17	10	1200281	1206071-01	250	250		PEST
L206221-MS5	QC	06/27/2012 13:35	30.1	10	1200123	1206071-01	250	250		PCB
L206221-MS6	QC	06/27/2012 13:35	30.23	10	1200123	1206072-01	250	250		PCB
L206221-MS7	QC	06/27/2012 13:35	30.11	10	1200123	1206075-02	250	250		PCB
L206221-MS8	QC	06/27/2012 13:35	30.03	10	1200123	1206076-01	250	250		PCB
L206221-MSD1	QC	06/27/2012 13:35	30.51	10	1200281	1206058-01	250	250		Pest
L206221-MSD2	QC	06/27/2012 13:35	30.51	10	1200123	1206058-01	250	250		PCB
L206221-MSD3	QC	06/27/2012 13:35	30.46	10	1200123	1206068-01	250	250		PCB

S cleaned Cu lot 616W031

Extracts Relinquished By 6/28/12 1410 Date

Extracts Received By 06.28.12 14.10 Date

PREPARATION BENCH SHEET

L206221

Lionville Laboratory

Printed: 6/28/2012 2:02:00PM

000000029

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
L206221-MSD4	QC	06/27/2012 13:35	30.58	10	1200281	1206071-01	250	250		PEST
L206221-MSD5	QC	06/27/2012 13:35	30.7	10	1200123	1206071-01	250	250		PCB
L206221-MSD6	QC	06/27/2012 13:35	30.83	10	1200123	1206072-01	250	250		PCB
L206221-MSD7	QC	06/27/2012 13:35	30.15	10	1200123	1206075-02	250	250		PCB
L206221-MSD8	QC	06/27/2012 13:35	30.07	10	1200123	1206076-01	250	250		PCB

S cleaned
Cu lot G160031

6/28/12 1410 SZak 06.28.12 14.10

Extracts Relinquished By Date Extracts Received By Date

PREPARATION BENCH SHEET

L207029

Lionville Laboratory

Printed: 7/9/2012 2:41:38PM

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
1206071-01RE2	8082 PCBs	07/06/2012 11:59	30.67	10				250	WC-Hanford, Inc.	Added 7/9/2012 by J_S
1206075-02RE2	8082 PCBs	07/06/2012 11:59	30.16	10				250	WC-Hanford, Inc.	Added 7/9/2012 by J_S
L207029-BLK1	QC	07/06/2012 11:59	30	10				250		
L207029-BS1	QC	07/06/2012 11:59	30	10	1200123		250	250		
L207029-MS1	QC	07/06/2012 11:59	30	10	1200123	206071-01RE	250	250		
L207029-MS2	QC	07/06/2012 11:59	30.38	10	1200123	206075-02RE	250	250		
L207029-MSD1	QC	07/06/2012 11:59	30.67	10	1200123	206071-01RE	250	250		
L207029-MSD2	QC	07/06/2012 11:59	30.16	10	1200123	206075-02RE	250	250		

From L206221 on 07/06/2012 by SA

Revision

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L207029

Lionville Laboratory

Printed: 7/9/2012 1:12:54PM

000000031

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
1206071-01	8082 PCBs	07/06/2012 11:59	30.67	10				250	WC-Hanford, Inc.	From L206221 by SA on 07/06/2012
1206075-02	8082 PCBs	07/06/2012 11:59	30.16	10				250	WC-Hanford, Inc.	From L206221 by SA on 07/06/2012
L207029-BLK1	QC	07/06/2012 11:59	30	10				250		
L207029-BS1	QC	07/06/2012 11:59	30	10	1200123		250	250		
L207029-MS1	QC	07/06/2012 11:59	30	10	1200123	1206071-01	250	250		
L207029-MS2	QC	07/06/2012 11:59	30.38	10	1200123	1206075-02	250	250		
L207029-MSD1	QC	07/06/2012 11:59	30.67	10	1200123	1206071-01	250	250		
L207029-MSD2	QC	07/06/2012 11:59	30.16	10	1200123	1206075-02	250	250		

From L206221 on 07/06/2012 by SA

S cleaned 07.09.12 SZ
Cu lot # G16W031

7/9/12 1330
Extracts Relinquished By Date

SZah 07.09.12 13:30
Extracts Received By Date

DIESEL

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-189 Project Number: K3938 Project Manager: Joan Kessner	**Reported:** 07/02/2012 19:27

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-189 K3938
LVL #: 1206071

W.O. #: 60049-001-001-0001-00
Date Received: 06-22-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 06-19-2012.

The sample and associated QC samples were extracted 06-26-2012 and analyzed 06-30-2012 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 a sample 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 sample was 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

7/3/12
Date

r:\group\data\2012\dro\wc hanford\1206071jes.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.

LIONVILLE LABORATORY INC.

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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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/02/2012 19:27

J1PT97
1206071-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	3350	U	3350	ug/kg dry	1	L206217	06/26/2012	06/30/2012	8015M
Motor Oil	10100	U	10100	ug/kg dry	1	L206217	06/26/2012	06/30/2012	8015M
Surrogate: p-Terphenyl	*78 %*		*39-129*			*L206217*	*06/26/2012*	*06/30/2012*	*8015M*

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/02/2012 19:27

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 L206217 - SW 3540C										
Blank (L206217-BLK1)				Prepared: 06/26/2012 Analyzed: 06/30/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*5420*			*ug/kg wet*	*6666.7*		*81*	*39-129*		
LCS (L206217-BS1)				Prepared: 06/26/2012 Analyzed: 06/30/2012						
Diesel Range Organics	51100		3330	ug/kg wet	66667		77	42-133		
Surrogate: p-Terphenyl	*5350*			*ug/kg wet*	*6666.7*		*80*	*39-129*		
Matrix Spike (L206217-MS2)		**Source: 1206071-01**		Prepared: 06/26/2012 Analyzed: 06/30/2012						
Diesel Range Organics	57600		3380	ug/kg dry	67597	3350 U	85	42-133		
Surrogate: p-Terphenyl	*6240*			*ug/kg dry*	*6759.7*		*92*	*39-129*		
Matrix Spike Dup (L206217-MSD2)		**Source: 1206071-01**		Prepared: 06/26/2012 Analyzed: 06/30/2012						
Diesel Range Organics	51900		3300	ug/kg dry	66101	3350 U	78	42-133	8	40
Surrogate: p-Terphenyl	*5460*			*ug/kg dry*	*6610.1*		*83*	*39-129*		

PREPARATION BENCH SHEET

L206217

Lionville Laboratory

Printed: 6/27/2012 3:14:05PM

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
1206068-01	8015M DRO	06/26/2012 15:08	30.26	1				1000	WC-Hanford, Inc.	
1206068-02	8015M DRO	06/26/2012 15:08	30.37	1				1000	WC-Hanford, Inc.	
1206071-01	8015M DRO	06/26/2012 15:08	30.3	1				1000	WC-Hanford, Inc.	
1206072-01	8015M DRO	06/26/2012 15:08	30.01	1				1000	WC-Hanford, Inc.	
1206075-02	8015M DRO	06/26/2012 15:08	30.94	1				1000	WC-Hanford, Inc.	
1206075-03	8015M DRO	06/26/2012 15:08	30.59	1				1000	WC-Hanford, Inc.	
1206075-04	8015M DRO	06/26/2012 15:08	30.27	4				1000	WC-Hanford, Inc.	
L206217-BLK1	QC	06/26/2012 15:08	30	1				1000		
L206217-BS1	QC	06/26/2012 15:08	30	1	1101936		1000	1000		
L206217-MS1	QC	06/26/2012 15:08	30.73	1	1101936	1206068-01	1000	1000		
L206217-MS2	QC	06/26/2012 15:08	30.04	1	1101936	1206071-01	1000	1000		
L206217-MS3	QC	06/26/2012 15:08	30.05	1	1101936	1206072-01	1000	1000		
L206217-MS4	QC	06/26/2012 15:08	31.16	1	1101936	1206075-02	1000	1000		
L206217-MSD1	QC	06/26/2012 15:08	31.5	1	1101936	1206068-01	1000	1000		
L206217-MSD2	QC	06/26/2012 15:08	30.72	1	1101936	1206071-01	1000	1000		
L206217-MSD3	QC	06/26/2012 15:08	30.1	1	1101936	1206072-01	1000	1000		
L206217-MSD4	QC	06/26/2012 15:08	30.2	1	1101936	1206075-02	1000	1000		

Extracts Relinquished By 6/27/12 15:15 Date

Extracts Received By 6-27-12 Date

PAHs

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/08/2012 07:42

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

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-189 K3938
LVL #: 1206071

W.O. #: 60049-001-001-0001-00
Date Received: 06-22-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 06-19-2012.

The sample and associated QC samples were extracted 06-26-2012 and analyzed 07-03-2012 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 8310.

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 a sample 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. One (1) of sixteen (16) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12GC112) has been enclosed.

6. Two (2) of thirty-two (32) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDDR#12GC112) has been enclosed.

7. The initial calibrations associated with this data set were within acceptance criteria.

8. Per SW846 Method 8000B, the attached Table 1 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. Results associated with these compounds are considered to have greater uncertainty.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of LC3-070512 (SEQ#2070010) for target compound Benzo (a) pyrene. See attached Form Table 1. The data reflected an increase in instrument response, so the ability to identify Benzo (a) pyrene was not impaired.

10. The sample was reported on a dry weight basis.

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

11. 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
LvL Laboratory Manager

7/17/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC112

Initiator: Catherine Carey
Date: 07·08·12
Client: WC Hanford

Batch: 1206068, 071, 072
Samples: BS1, MS2, MSD2, MS3, MSD3
Method: SW846/MCAWW/CLP/ MS4, MSD4

Parameter: PAH
Matrix: SOIL
Prep Batch: L206218

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy
__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

Naphthalene recovery is high in all spike samples

Acenaphthene recovery is low in MS4 (-15%) - okay in MSD4

2. Known or Probable Causes(s) Naphthalene recovery (high) suspected to be a problem w/ spiking solution - checking w/ vendor

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description: Naphthalene BS/MS
Narrate: high recovery - not detected in sample JIPT73/74
Naphthalene present in JIPT97 and JIPR33

4. Project Manager Instructions...signature/date: [illegible] for O Johnson 7.9.12
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: [illegible] 7/13/12 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA for diposition.

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

TABLE 1

8310 PAH

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

Analyte	Inj 1336 7/5/12 0709 CCV1	CCV2	CCV3	CCV4	CCV5	CCV6	CCV7	CCV8
Triphenylene (surrogate)								
Naphthalene								
Acenaphthylene								
Acenaphthene								
Fluorene								
Phenanthrene								
Anthracene								
Fluoranthene								
Indeno[1,2,3-cd]pyrene								
Pyrene								
Benz[a]anthracene								
Chrysene								
Benzo[b]fluoranthene								
Benzo[k]fluoranthene								
Benzo[a]pyrene	+16.1							
Dibenz[a,h]anthracene								
Benzo[g,h,i]perylene								
Mean %D or %Drift	5.5							

Sample results reported from affected CCV:

CCV1: 1206068-01,02 120671-01 120672-01

CCV2:

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

LE 7-6-12

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.

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/08/2012 07:42

J1PT97
1206071-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**3.59**		3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Acenaphthylene	3.28	U	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Acenaphthene	**4.94**		3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Fluorene	3.28	U	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Phenanthrene	**2.15**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Anthracene	3.28	U	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Fluoranthene	**3.77**		3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Indeno[1,2,3-cd]pyrene	**1.33**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Pyrene	**5.10**		3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Benz[a]anthracene	**3.17**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Chrysene	**2.64**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Benzo[b] fluoranthene	**0.902**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Benzo[k] fluoranthene	**0.853**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Benzo[a] pyrene	**2.62**	J	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Dibenz[a,h]anthracene	3.28	U	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Benzo[g,h,i] perylene	3.28	U	3.28	ug/kg dry	1	L206218	06/26/2012	07/05/2012	8310
Surrogate: Triphenylene	*101 %*		*68-129*			*L206218*	*06/26/2012*	*07/05/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/08/2012 07:42

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206218 - SW 3540C										
Blank (L206218-BLK1)				Prepared: 06/26/2012 Analyzed: 07/03/2012						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	3.33	U	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	0.833	J	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*163*			*ug/kg wet*	*166.67*		*98*	*68-129*		
LCS (L206218-BS1)				Prepared: 06/26/2012 Analyzed: 07/03/2012						
Naphthalene	539		3.33	ug/kg wet	166.67		323*	0-127		
Acenaphthylene	151		3.33	ug/kg wet	166.67		90	50-140		
Acenaphthene	142		3.33	ug/kg wet	166.67		85	17-139		
Fluorene	144		3.33	ug/kg wet	166.67		86	28-145		
Phenanthrene	141		3.33	ug/kg wet	166.67		85	30-152		
Anthracene	73.0		3.33	ug/kg wet	166.67		44	19-171		
Fluoranthene	145		3.33	ug/kg wet	166.67		87	34-159		
Indeno[1,2,3-cd]pyrene	148		3.33	ug/kg wet	166.67		89	31-156		
Pyrene	142		3.33	ug/kg wet	166.67		85	33-152		
Benz[a]anthracene	139		3.33	ug/kg wet	166.67		83	32-157		
Chrysene	150		3.33	ug/kg wet	166.67		90	31-159		
Benzo[b] fluoranthene	142		3.33	ug/kg wet	166.67		85	33-164		
Benzo[k] fluoranthene	148		3.33	ug/kg wet	166.67		89	28-161		
Benzo[a] pyrene	135		3.33	ug/kg wet	166.67		81	29-149		
Dibenz[a,h]anthracene	133		3.33	ug/kg wet	166.67		80	27-153		
Benzo[g,h,i] perylene	134		3.33	ug/kg wet	166.67		80	32-157		
Surrogate: Triphenylene	*170*			*ug/kg wet*	*166.67*		*102*	*68-129*		

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/08/2012 07:42

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206218 - SW 3540C									
Matrix Spike (L206218-MS3)	**Source: 1206071-01**		Prepared: 06/26/2012 Analyzed: 07/05/2012						
Naphthalene	461	3.35	ug/kg dry	167.49	3.59	273*	0-127		
Acenaphthylene	148	3.35	ug/kg dry	167.49	3.28 U	88	50-140		
Acenaphthene	156	3.35	ug/kg dry	167.49	4.94	90	17-139		
Fluorene	144	3.35	ug/kg dry	167.49	3.28 U	86	28-145		
Phenanthrene	146	3.35	ug/kg dry	167.49	2.15	86	30-152		
Anthracene	76.2	3.35	ug/kg dry	167.49	3.28 U	45	19-171		
Fluoranthene	151	3.35	ug/kg dry	167.49	3.77	88	34-159		
Indeno[1,2,3-cd]pyrene	151	3.35	ug/kg dry	167.49	1.33	90	31-156		
Pyrene	145	3.35	ug/kg dry	167.49	5.10	83	33-152		
Benz[a]anthracene	144	3.35	ug/kg dry	167.49	3.17	84	32-157		
Chrysene	150	3.35	ug/kg dry	167.49	2.64	88	31-159		
Benzo[b] fluoranthene	145	3.35	ug/kg dry	167.49	0.902	86	33-164		
Benzo[k] fluoranthene	149	3.35	ug/kg dry	167.49	0.853	88	28-161		
Benzo[a] pyrene	135	3.35	ug/kg dry	167.49	2.62	79	29-149		
Dibenz[a,h]anthracene	134	3.35	ug/kg dry	167.49	3.28 U	80	27-153		
Benzo[g,h,i] perylene	138	3.35	ug/kg dry	167.49	3.28 U	82	32-157		
Surrogate: Triphenylene	*178*		*ug/kg dry*	*167.49*		*106*	*68-129*		
Matrix Spike Dup (L206218-MSD3)	**Source: 1206071-01**		Prepared: 06/26/2012 Analyzed: 07/05/2012						
Naphthalene	444	3.29	ug/kg dry	164.82	3.59	267*	0-127	2	40
Acenaphthylene	145	3.29	ug/kg dry	164.82	3.28 U	88	50-140	0.2	40
Acenaphthene	136	3.29	ug/kg dry	164.82	4.94	79	17-139	13	40
Fluorene	142	3.29	ug/kg dry	164.82	3.28 U	86	28-145	0.2	40
Phenanthrene	144	3.29	ug/kg dry	164.82	2.15	86	30-152	0.6	40
Anthracene	74.5	3.29	ug/kg dry	164.82	3.28 U	45	19-171	0.6	40
Fluoranthene	149	3.29	ug/kg dry	164.82	3.77	88	34-159	0.2	40
Indeno[1,2,3-cd]pyrene	148	3.29	ug/kg dry	164.82	1.33	89	31-156	0.9	40
Pyrene	142	3.29	ug/kg dry	164.82	5.10	83	33-152	0.04	40
Benz[a]anthracene	140	3.29	ug/kg dry	164.82	3.17	83	32-157	1	40
Chrysene	147	3.29	ug/kg dry	164.82	2.64	88	31-159	0.5	40
Benzo[b] fluoranthene	138	3.29	ug/kg dry	164.82	0.902	83	33-164	3	40
Benzo[k] fluoranthene	144	3.29	ug/kg dry	164.82	0.853	87	28-161	2	40
Benzo[a] pyrene	130	3.29	ug/kg dry	164.82	2.62	77	29-149	3	40
Dibenz[a,h]anthracene	130	3.29	ug/kg dry	164.82	3.28 U	79	27-153	2	40
Benzo[g,h,i] perylene	134	3.29	ug/kg dry	164.82	3.28 U	81	32-157	2	40
Surrogate: Triphenylene	*150*		*ug/kg dry*	*164.82*		*91*	*68-129*		

PREPARATION BENCH SHEET

L206218

Lionville Laboratory

Printed: 6/27/2012 3:12:16PM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1206058-01	8310 PAH	06/26/2012 15:50	30.57	5				50	WC-Hanford, Inc.	
1206058-02	8310 PAH	06/26/2012 15:50	30.54	5				50	WC-Hanford, Inc.	
1206068-01	8310 PAH	06/26/2012 15:50	31.17	5				50	WC-Hanford, Inc.	
1206068-02	8310 PAH	06/26/2012 15:50	30.32	5				50	WC-Hanford, Inc.	
1206071-01	8310 PAH	06/26/2012 15:50	30.95	5				50	WC-Hanford, Inc.	
1206072-01	8310 PAH	06/26/2012 15:50	30.34	5				50	WC-Hanford, Inc.	
1206075-02	8310 PAH	06/26/2012 15:50	30.75	5				50	WC-Hanford, Inc.	
1206075-03	8310 PAH	06/26/2012 15:50	30.49	5				50	WC-Hanford, Inc.	
1206075-04	8310 PAH	06/26/2012 15:50	30.41	5				50	WC-Hanford, Inc.	
L206218-BLK1	QC	06/26/2012 15:50	30	5				50		
L206218-BS1	QC	06/26/2012 15:50	30	5	1200436		50	50		
L206218-MS1	QC	06/26/2012 15:50	30.59	5	1200436	1206058-02	50	50		
L206218-MS2	QC	06/26/2012 15:50	30.8	5	1200436	1206068-01	50	50		
L206218-MS3	QC	06/26/2012 15:50	30.31	5	1200436	1206071-01	50	50		
L206218-MS4	QC	06/26/2012 15:50	30.05	5	1200436	1206072-01	50	50		
L206218-MS5	QC	06/26/2012 15:50	31.06	5	1200436	1206075-02	50	50		
L206218-MSD1	QC	06/26/2012 15:50	30.38	5	1200436	1206058-02	50	50		
L206218-MSD2	QC	06/26/2012 15:50	30.6	5	1200436	1206068-01	50	50		
L206218-MSD3	QC	06/26/2012 15:50	30.8	5	1200436	1206071-01	50	50		
L206218-MSD4	QC	06/26/2012 15:50	30.25	5	1200436	1206072-01	50	50		

Extracts Relinquished By 6/27/12 1515 Date

LK 6-27-12
Extracts Received By Date

PREPARATION BENCH SHEET

L206218

Lionville Laboratory

Printed: 6/27/2012 3:12:16PM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
L206218-MSD5	QC	06/26/2012 15:50	30.87	5	1200436	1206075-02	50	50		

Extracts Relinquished By 6/27/12 Date 1515

Extracts Received By UC 6-27-12 Date

METALS

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/03/2012 13:53

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-189
LVL#: 1206071
SDG/SAF#: K3938/RC-189

W.O.#: 60049-001-001-0001-00
Date Received: 06-22-12

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 analysis of 1 soil sample.

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

   The metals internal standard, Yttrium, was not used in the calculation of these data due to the native concentrations of Yttrium in the client samples. Please refer to the SEQ-CAL1 page of the ICP raw data.

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

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.

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.

10. The matrix spike (MS) recoveries for 6 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 following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1PT97	Aluminum	22,000	95.7
	Antimony	100	100.3
	Calcium	20,800	82.7
	Iron	42,000	40.2
	Manganese	1,000	77.2
	Silicon	2,100	125.7

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Arsenic, Boron, and Molybdenum were less than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

7/5/12
Date

alm/06-071

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-189 Project Number: K3938 Project Manager: Joan Kessner	**Reported:** 07/03/2012 13:53

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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-189 Project Number: K3938 Project Manager: Joan Kessner	**Reported:** 07/03/2012 13:53

J1PT97
1206071-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**5660**		4.38	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Antimony	0.525	U	0.525	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Arsenic	**1.95**		0.875	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Barium	**72.2**		0.438	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Beryllium	**0.288**		0.175	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Boron	**0.689**	B	1.75	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Cadmium	**0.0788**	B	0.175	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Calcium	**7170**		87.5	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Chromium	**4.57**		0.175	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Cobalt	**8.83**		1.75	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Copper	**16.4**		0.875	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Iron	**32000**		17.5	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Lead	**2.81**		0.438	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Magnesium	**5530**		65.6	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Manganese	**508**		4.38	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Molybdenum	**0.580**	B	1.75	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Nickel	**8.24**		3.50	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Potassium	**864**		350	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Selenium	0.263	U	0.263	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Silicon	**157**		1.75	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Silver	0.175	U	0.175	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Sodium	**371**		43.8	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Vanadium	**93.0**		2.19	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Zinc	**56.1**		8.75	mg/kg dry	1	L206223	06/27/2012	06/28/2012	6010B
Mercury	0.0240	U	0.0240	mg/kg dry	1	L206232	06/28/2012	06/29/2012	7471A

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

WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	07/03/2012 13:53

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 L206223 - SW 3050B										
Blank (L206223-BLK1)				Prepared: 06/27/2012 Analyzed: 06/28/2012						
Aluminum	4.46	U	4.46	mg/kg wet						
Antimony	0.536	U	0.536	mg/kg wet						
Arsenic	0.893	U	0.893	mg/kg wet						
Barium	0.446	U	0.446	mg/kg wet						
Beryllium	0.179	U	0.179	mg/kg wet						
Boron	1.79	U	1.79	mg/kg wet						
Cadmium	0.179	U	0.179	mg/kg wet						
Calcium	89.3	U	89.3	mg/kg wet						
Chromium	0.179	U	0.179	mg/kg wet						
Cobalt	1.79	U	1.79	mg/kg wet						
Copper	0.893	U	0.893	mg/kg wet						
Iron	17.9	U	17.9	mg/kg wet						
Lead	0.446	U	0.446	mg/kg wet						
Magnesium	67.0	U	67.0	mg/kg wet						
Manganese	4.46	U	4.46	mg/kg wet						
Molybdenum	1.79	U	1.79	mg/kg wet						
Nickel	3.57	U	3.57	mg/kg wet						
Potassium	357	U	357	mg/kg wet						
Selenium	0.268	U	0.268	mg/kg wet						
Silicon	1.79	U	1.79	mg/kg wet						
Silver	0.179	U	0.179	mg/kg wet						
Sodium	44.6	U	44.6	mg/kg wet						
Vanadium	2.23	U	2.23	mg/kg wet						
Zinc	8.93	U	8.93	mg/kg wet						
Duplicate (L206223-DUP1)			**Source: 1206071-01**	Prepared: 06/27/2012 Analyzed: 06/28/2012						
Aluminum	5130		3.38	mg/kg dry		5660			9.90	20
Antimony	0.406	U	0.406	mg/kg dry		0.525 U				20
Arsenic	1.53		0.677	mg/kg dry		1.95			24.1*	20
Barium	64.4		0.338	mg/kg dry		72.2			11.4	20
Beryllium	0.237		0.135	mg/kg dry		0.288			19.4	20
Boron	0.516	B	1.35	mg/kg dry		0.689			28.8*	20
Cadmium	0.0685	B	0.135	mg/kg dry		0.0788			14.0	20
Calcium	6540		67.7	mg/kg dry		7170			9.28	20
Chromium	3.54		0.135	mg/kg dry		4.57			25.4*	20
Cobalt	7.59		1.35	mg/kg dry		8.83			15.1	20
Copper	14.4		0.677	mg/kg dry		16.4			12.9	20

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Richland WA, 99354	Project Manager: Joan Kessner	07/03/2012 13:53

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 L206223 - SW 3050B										
Duplicate (L206223-DUP1)		**Source: 1206071-01**		Prepared: 06/27/2012 Analyzed: 06/28/2012						
Iron	28500		13.5	mg/kg dry		32000			11.7	20
Lead	2.31		0.338	mg/kg dry		2.81			19.3	20
Magnesium	5030		50.8	mg/kg dry		5530			9.55	20
Manganese	345		3.38	mg/kg dry		508			38.3*	20
Molybdenum	0.433	B	1.35	mg/kg dry		0.580			29.0*	20
Nickel	6.89		2.71	mg/kg dry		8.24			17.8	20
Potassium	727		271	mg/kg dry		864			17.2	20
Selenium	0.203	U	0.203	mg/kg dry		0.263 U				20
Silicon	118		1.35	mg/kg dry		157			28.5*	20
Silver	0.135	U	0.135	mg/kg dry		0.175 U				20
Sodium	440		33.8	mg/kg dry		371			17.0	20
Vanadium	78.0		1.69	mg/kg dry		93.0			17.5	20
Zinc	47.6		6.77	mg/kg dry		56.1			16.5	20
Matrix Spike (L206223-MS1)		**Source: 1206071-01**		Prepared: 06/27/2012 Analyzed: 06/28/2012						
Aluminum	6650		4.38	mg/kg dry	175.05	5660	565*	75-125		
Antimony	21.1		0.525	mg/kg dry	43.763	0.525 U	48.2*	75-125		
Arsenic	161		0.875	mg/kg dry	175.05	1.95	90.7	75-125		
Barium	271		0.438	mg/kg dry	175.05	72.2	113	75-125		
Beryllium	4.57		0.175	mg/kg dry	4.3763	0.288	97.9	75-125		
Boron	71.0		1.75	mg/kg dry	87.526	0.689	80.4	75-125		
Cadmium	3.68		0.175	mg/kg dry	4.3763	0.0788	82.4	75-125		
Calcium	10400		87.5	mg/kg dry	2188.2	7170	147*	75-125		
Chromium	20.8		0.175	mg/kg dry	17.505	4.57	92.4	75-125		
Cobalt	46.7		1.75	mg/kg dry	43.763	8.83	86.6	75-125		
Copper	35.9		0.875	mg/kg dry	21.882	16.4	89.2	75-125		
Iron	32800		17.5	mg/kg dry	87.526	32000	950*	75-125		
Lead	39.0		0.438	mg/kg dry	43.763	2.81	82.7	75-125		
Magnesium	7990		65.6	mg/kg dry	2188.2	5530	112	75-125		
Manganese	450		4.38	mg/kg dry	43.763	508	-132*	75-125		
Molybdenum	79.8		1.75	mg/kg dry	87.526	0.580	90.5	75-125		
Nickel	46.1		3.50	mg/kg dry	43.763	8.24	86.6	75-125		
Potassium	3040		350	mg/kg dry	2188.2	864	99.6	75-125		
Selenium	146		0.263	mg/kg dry	175.05	0.263 U	83.2	75-125		
Silicon	273		1.75	mg/kg dry	87.526	157	132*	75-125		
Silver	3.88		0.175	mg/kg dry	4.3763	0.175 U	88.6	75-125		
Sodium	2840		43.8	mg/kg dry	2188.2	371	113	75-125		

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2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/03/2012 13:53

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 L206223 - SW 3050B									
Matrix Spike (L206223-MS1)		**Source: 1206071-01**	Prepared: 06/27/2012 Analyzed: 06/28/2012						
Vanadium	136	2.19	mg/kg dry	43.763	93.0	97.6	75-125		
Zinc	95.0	8.75	mg/kg dry	43.763	56.1	88.7	75-125		
Reference (L206223-SRM1)			Prepared: 06/27/2012 Analyzed: 06/28/2012						
Aluminum	9360	14.4	mg/kg wet	6670.0		140	0-200.89		
Antimony	28.9	1.73	mg/kg wet	53.000		54.6	0-235.8		
Arsenic	112	2.88	mg/kg wet	114.00		98.6	82.8-117.54		
Barium	292	1.44	mg/kg wet	307.00		95.2	79.8-120.2		
Beryllium	103	0.577	mg/kg wet	108.00		95.6	82.8-117.6		
Boron	76.3	5.77	mg/kg wet	85.100		89.7	67.5-132.8		
Cadmium	219	0.577	mg/kg wet	225.00		97.4	83.6-116.4		
Calcium	3350	288	mg/kg wet	3360.0		99.8	83.3-116.9		
Chromium	81.2	0.577	mg/kg wet	77.200		105	73.3-126.4		
Cobalt	162	5.77	mg/kg wet	166.00		97.6	80.7-118.7		
Copper	259	2.88	mg/kg wet	271.00		95.6	80.8-119.2		
Iron	8400	57.7	mg/kg wet	8420.0		99.8	78.6-121.1		
Lead	186	1.44	mg/kg wet	190.00		97.9	81.6-118.4		
Magnesium	8280	216	mg/kg wet	8570.0		96.6	83.2-116.7		
Manganese	924	14.4	mg/kg wet	965.00		95.8	69.3-130.5		
Molybdenum	232	5.77	mg/kg wet	235.00		98.6	76.2-123.8		
Nickel	218	11.5	mg/kg wet	221.00		98.5	79.6-120.8		
Potassium	14400	1150	mg/kg wet	14400		99.9	81.9-118.1		
Selenium	179	0.865	mg/kg wet	187.00		95.6	75.9-124.6		
Silicon	335	5.77	mg/kg wet	807.00		41.5	0-219.3		
Silver	80.9	0.577	mg/kg wet	83.500		96.9	82.7-117.1		
Sodium	9360	144	mg/kg wet	9730.0		96.2	82.5-117.2		
Vanadium	109	7.21	mg/kg wet	98.700		111	75.9-123.6		
Zinc	193	28.8	mg/kg wet	199.00		96.8	78.4-121.6		

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2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/03/2012 13:53

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 L206232 - SW 7471A Prep										
Blank (L206232-BLK1)				Prepared: 06/28/2012 Analyzed: 06/29/2012						
Mercury	0.0281	U	0.0281	mg/kg wet						
Duplicate (L206232-DUP1)		**Source: 1206071-01**		Prepared: 06/28/2012 Analyzed: 06/29/2012						
Mercury	0.0261	U	0.0261	mg/kg dry		0.0240 U				20
Matrix Spike (L206232-MS1)		**Source: 1206071-01**		Prepared: 06/28/2012 Analyzed: 06/29/2012						
Mercury	0.163		0.0269	mg/kg dry	0.14931	0.0240 U	109	75-125		20
Reference (L206232-SRM1)				Prepared: 06/28/2012 Analyzed: 06/29/2012						
Mercury	1.27		0.0290	mg/kg wet	1.2900		98.6	62.6-138		

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L206223
Date/Time Initiated: 6/27/12 1070
Date/Time Completed: 6/27/12 1635
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: BIY
Balance Cal Verification: Y NA
Temp: 99
BLOCK 1 2 3 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1206071-01		0.58	50		TO	Fine	Grey	Rocks	N/A
L206223-Dup1		0.75	50						
-MS1	0.5	0.58	50						
1206072-01		0.63	50			Fine	Brown	Rocks	
L206223-Dup2		0.61	50						
-MS2	0.5	0.70	50						
-BLK1		0.56	50			Coarse	Boiling Chips		
-SRM1		0.52	50			Fine	pink sand		

JJS
6/27/12

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

Reagent IDs:
HNO_3 L08023
HCl L01031
H_2O_2 K09103
1:1 HNO_3 637-66-02
1:1 HCl

File ID#:

Data Review By/Date: 7/2/12

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Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 6/28/12
Start Time/Temp: 1930/95°
End Time/Temp: 2000/98°

Instrument ID: HG3.1
Balance # B79 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1143
Prep Batch: L206232
Worksheet: HG062901
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				10 ml	50	
0.2 ug/l		0.100		10 ml	50	
1.0 ug/l		0.500		10 ml	50	
2.0 ug/l		1.000		10 ml	50	
5.0 ug/l		2.500		10 ml	50	
10.0 ug/l		5.000		10 ml	50	
ICV		0.125	2.5	10 ml	50	
CCV		0.250	5.0	10 ml	50	
ICB/CCB				10 ml	50	
L206232-BLK1				0.32	50	
SRM1				0.31	50	
1206071-01				0.38	50	
L206232-DUP1				0.35	50	
MS1		0.500	1.0	0.34	50	
1206072-01				0.36	50	
L206232-DUP2				0.35	50	
MS2		0.500	1.0	0.35	50	
1206073-01 W.E.				0.35	50	
L206232-DUP3				0.33	50	
MS3		0.500	1.0	0.33	50	
1206073-02				0.34	50	
03				0.35	50	
04				0.37	50	
05				0.38	50	
06				0.35	50	
07				0.33	50	
08				0.35	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	6/28/12 1515
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 7/3/12

se book # 1143, pg 1 for std traceability information

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

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

PREPARATION BENCH SHEET

L206223

Lionville Laboratory

Printed: 6/27/2012 4:09:49PM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1206071-01	6010B HSL Metals	06/27/2012 10:07	0.58	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
1206072-01	6010B HSL Metals	06/27/2012 10:07	0.63	50					WC-Hanford, Inc.	HSL + B, Mo, Si (No TL)
L206223-BLK1	QC	06/27/2012 10:07	0.56	50						
L206223-DUP1	QC	06/27/2012 10:07	0.75	50		1206071-01				
L206223-DUP2	QC	06/27/2012 10:07	0.61	50		1206072-01				
L206223-MS1	QC	06/27/2012 10:07	0.58	50	1200457	1206071-01	500			
L206223-MS2	QC	06/27/2012 10:07	0.7	50	1200457	1206072-01	500			
L206223-SRM1	QC	06/27/2012 10:07	0.52	50	1101357		520			

JJS 6/28/12
Extracts Relinquished By Date

Brewer 06/28/12
Extracts Received By Date

INORGANICS

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/28/2012 18:50

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1PT97	1206071-01	Soil	06/19/2012 07:16	06/22/2012 10:10

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-189 K3938
LVL#: 1206071 **Date Received:** 06-22-12

INORGANIC NARRATIVE

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

2. The sample was 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 exception of Nitrite, Nitate 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 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.

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 with the exception of Nitrate Nitrite that was at 85.5% for which the replicate results were less than the limit of quantitation.

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

7/2/12
Date

njp\i06-071

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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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/28/2012 18:50

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1PT97 (1206071-01) Soil										
%Solids	**98.5**			0.1	% by Weight	1	L206200	06/25/2012	06/25/2012	SM2540G
Bromide	1.0	U	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Chloride	1.0	U	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Nitrate	1.0	U	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Orthophosphate	2.0	U	2.0	9.8	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Sulfate	**3.4**	B	1.0	4.9	mg/kg dry	1	L206214	06/26/2012	06/26/2012	EPA 300.0 (1993)
Nitrate/Nitrite as N	**0.12**	B	0.10	0.49	mg/kg dry	1	L206215	06/26/2012	06/26/2012	EPA 353.2
pH	**9.53**			0.10	pH Units	1	L206210	06/26/2012	06/26/2012	SW846 9045D

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Richland WA, 99354	Project Manager: Joan Kessner	06/28/2012 18:50

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206200 - % Solids										
Duplicate (L206200-DUP4)	**Source: 1206071-01**			Prepared & Analyzed: 06/25/2012						
%Solids	98.5		0.1	% by Weight		98.5			0.03	20
Batch L206210 - Default Prep GenChem										
Duplicate (L206210-DUP2)	**Source: 1206071-01**			Prepared & Analyzed: 06/26/2012						
pH	9.46		0.10	pH Units		9.53			0.737	20
Reference (L206210-SRM1)				Prepared & Analyzed: 06/26/2012						
pH	9.99		0.10	pH Units	10.000		99.9	99-101		
Batch L206214 - Default Prep GenChem										
Blank (L206214-BLK1)				Prepared & Analyzed: 06/26/2012						
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 (L206214-BS1)				Prepared & Analyzed: 06/26/2012						
Fluoride	49.9	1.0	5.0	mg/kg wet	50.000		99.8	80-120		
Chloride	46.8	1.0	5.0	mg/kg wet	50.000		93.6	80-120		
Bromide	48.5	1.0	5.0	mg/kg wet	50.000		97.0	80-120		
Orthophosphate	47.6	2.0	10.0	mg/kg wet	50.000		95.2	80-120		
Sulfate	48.1	1.0	5.0	mg/kg wet	50.000		96.2	80-120		
Nitrate	47.8	1.0	5.0	mg/kg wet	50.000		95.6	80-120		
Nitrite	48.9	1.0	5.0	mg/kg wet	50.000		97.8	80-120		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-189 Project Number: K3938 Project Manager: Joan Kessner	**Reported:** 06/28/2012 18:50

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206214 - Default Prep GenChem										
Duplicate (L206214-DUP4)	**Source: 1206071-01**			Prepared & Analyzed: 06/26/2012						
Fluoride	1.0 U	1.0	4.8	mg/kg dry		1.0 U				20
Chloride	1.0 U	1.0	4.8	mg/kg dry		1.0 U				20
Bromide	1.0 U	1.0	4.8	mg/kg dry		1.0 U				20
Orthophosphate	1.9 U	1.9	9.6	mg/kg dry		2.0 U				20
Sulfate	3.7 B	1.0	4.8	mg/kg dry		3.4			6.88	20
Nitrate	1.0 U	1.0	4.8	mg/kg dry		1.0 U				20
Nitrite	1.0 U	1.0	4.8	mg/kg dry		1.0 U				20
Matrix Spike (L206214-MS4)	**Source: 1206071-01**			Prepared & Analyzed: 06/26/2012						
Fluoride	51.1	1.0	5.0	mg/kg dry	50.463	1.0 U	101	75-125		
Chloride	47.8	1.0	5.0	mg/kg dry	50.463	1.0 U	94.8	75-125		
Bromide	48.7	1.0	5.0	mg/kg dry	50.463	1.0 U	96.6	75-125		
Orthophosphate	48.4	2.0	10.1	mg/kg dry	50.463	2.0 U	96.0	75-125		
Sulfate	52.3	1.0	5.0	mg/kg dry	50.463	3.4	96.8	75-125		
Nitrate	48.9	1.0	5.0	mg/kg dry	50.463	1.0 U	97.0	75-125		
Nitrite	49.8	1.0	5.0	mg/kg dry	50.463	1.0 U	98.6	75-125		
Batch L206215 - Default Prep GenChem										
Blank (L206215-BLK1)				Prepared & Analyzed: 06/26/2012						
Nitrate/Nitrite as N	0.10 U	0.10	0.49	mg/kg wet						
LCS (L206215-BS1)				Prepared & Analyzed: 06/26/2012						
Nitrate/Nitrite as N	5.06	0.09	0.47	mg/kg wet	4.6671		108	90-110		
Duplicate (L206215-DUP4)	**Source: 1206071-01**			Prepared & Analyzed: 06/26/2012						
Nitrate/Nitrite as N	0.31 B	0.10	0.48	mg/kg dry		0.12			85.5*	20

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WC-Hanford, Inc.	Project: RC-189	
2620 Fermi Avenue	Project Number: K3938	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	06/28/2012 18:50

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L206215 - Default Prep GenChem										
Matrix Spike (L206215-MS4)		**Source: 1206071-01**		Prepared & Analyzed: 06/26/2012						
Nitrate/Nitrite as N	5.11	0.10	0.50	mg/kg dry	5.0463	0.12	98.7	75-125		