SAF-RC-148
300 Area D4 Waste Sites –
Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 12/11/12
INITIAL/DATE

COMMENTS:

SDG K4018 SAF-RC-148

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 300-46 Waste Site (3706 Bldg) Verification

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

11 December 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 #	1211001
SDG #	K4018
SAF #	RC-148
Date Received	11/01/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
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 69 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

121001

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF# RC-148
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SR TAT: 21
Date Rec'd: 11-1-12 Date Due: 11-22-12

		A	B	C	D	E	F
Refrigerator #		2	2	2	2	2	2
#/Type Container	Liquid			1			
	Solid	1AG	1AG	1AG	1AG	1AG	1AG
Volume	Liquid						
	Solid	120	120	120	60	60	60
Preservatives		–	–	–	–	–	–
ANALYSES REQUESTED		ORGANIC			INORG		
		VOA	BNA	~~Pest~~ PCB	Herb	Metal ~~Hg~~	CN
			8270D	8082	8310	METALS	ANIONS

Lionville Laboratory Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	PCB	Herb			Metal	CN	Anions	NO2 NO3	Cr+6 7196
01	J1R433-A	✓	✓	Soil	10-24-12	0941		X	X		X		X		X	X	X

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	11/1/12	0980

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-071	Page ~~1 of 2~~ 1 Of 1

Collector: Simonds, M	Company Contact: Joan Kessner; Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: 21 Days (10/24/12)
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 300 - 46 Waste Site [3706 Bldg] Verification	SAF No.: RC-148	
Ice Chest No.: WCH-12-026	Field Logbook No.: EL-1663-04; COA: R300462000	Method of Shipment: Hand Deliver/Government Vehicle/FedEx	
Shipped To: Lionville ~~Denver~~ ~~TestAmerica Incorporated, Richland~~ AJ 10-30-12 10/24/12	Offsite Property No.: A120635	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive LDOT Limits AJ 10-30-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	60mL	15mL	60mL	120mL	120mL	120mL	500ml	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	See item (2) in Special Instructions.	Isotopic Uranium	Isotopic Plutonium	Strontium-89,90 -- Total Sr

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1R432~~ 10/24/12	~~SOIL~~											RCF	
J1R433 - A	SOIL	10/24/2012	0941	✓	* ✓	✓	✓	✓	✓			34783	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LVI Hilarina Simonds	10/24/12 1345	David Becker	10/24/12 1345
David Becker	10/24/12 1705	1060#3 A. Freier	1705 10-24-12
1060#3 A. Freier	WCH 10-31-12 0949	Fed Ex	
Fed Ex	11-01-12 0950	Victor Hernandez	11-01-12 0950

SPECIAL INSTRUCTIONS — 10/24/12

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

~~(2) Gamma Spec (Client List)~~ {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, ~~Europium-155, Radium-226, Radium-228~~, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65} AJ 10-24-12

* Please include Hex Chromium (7196) on Sample J1R433-A. Contact Joan Kessner with questions. AJ 10-30-12

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

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

REVIEWED BY CMB DATE 10-31-12

WCH-EE-011

000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-148

Date: 11/1/12

LvL Batch #: 1211001

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 793970724380
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	**Temp** 2-2	°C	Cooler # WCH-12-026
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 11/1/12	☑ No NO3, NO2, OPO4 rec'd 11/1/12	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

SR-002-B-0412.doc

SEMIVOLATILES

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/18/2012 12:11

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R433-A	1211001-01	Soil	10/24/2012 09:41	11/01/2012 09:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-148 K4018
LVL #: 1211001

W.O. #: 60049-001-001-0001-00
Date Received: 11-01-2012

SEMIVOLATILE

One (1) soil sample was collected on 10-24-2012.

The sample and associated QC samples were extracted 11-05-2012 and analyzed 11-10-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for client specified target compounds.

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 with exceptions noted on the Sample Receipt Checklist.

2. The sample was extracted and analyzed within holding time.

3. Non-target compounds were detected in these samples.

4. All samples required 5-fold instrument dilutions due to sample matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. The method blank was below the reporting limit for all target compounds.

7. All blank spike recoveries were within acceptance criteria

8. Four (4) of one hundred and twenty-eight matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR # 12MS198) has been enclosed.

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

10. All initial calibrations associated with this data set were within acceptance criteria. Per method 8000B/8270C, the attached Table 1 shows the target compounds where the RSD exceeded 15%, and the mean RSD was used for evaluation of the initial calibration. Results associated with these compounds are considered to have greater uncertainty. Refer to the Analysis Batch Sequence Summary Forms to associate the calibration with client samples.

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

12. Internal standard area and retention time criteria were met.

13. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags for Manual Integration").

14. 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 package has been authorized by the Laboratory Manager or designee, as verified by the following signature.

for Iain Daniels
LvL Laboratory Manager

12/11/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS198

Initiator: Sharon Saylor
Date: 11-18-12
Client: WCHanford

Batch: 1211001
Samples: L211044-MSD, MSD2
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: SOIL
Prep Batch: L211044

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)

① low recovery of 2,4-dinitrophenol and pentachlorophenol in L211044-MS2 and L211044-MSD2 but L211044-BS2 is OK

2. Known or Probable Causes(s) Acidic phenols subject to erratic chromatographic behavior. Possible matrix effect samples required a 5 fold dilution for analysis

[illegible] 11/20/12

3. Discussion and Proposed Action Other Description: narrate

__ 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: [illegible] 12/11/12

✓ 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] 12/11/12 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

TCL - 8000B/8270C COMPOUNDS WHERE THE MEAN %RSD IS USED TO MEET CRITERIA FOR INITIAL CALIBRATION OF AN INDIVIDUAL COMPOUND

MEAN RSD USED FOR EVALUATION: 9.70 CALIBRATION: 121016

>15% RSD	Compound	>15% RSD	Compound	>15% RSD	Compound
	1,2,4-Trichlorobenzene		Di-n-butyl Phthalate		**Surrogates:**
	1,2-Dichlorobenzene		Di-n-octyl Phthalate		2-Fluorophenol
	1,3-Dichlorobenzene		Fluoranthene		Phenol-d5
	1,4-Dichlorobenzene		Fluorene		Nitrobenzene-d5
	2,4,5-Trichlorophenol		Hexachlorobenzene		2-Fluorobiphenyl
	2,4,6-Trichlorophenol		Hexachlorobutadiene	✓	2,4,6-Tribromophenol
	2,4-Dichlorophenol		Hexachlorocyclopentadiene		p-Terphenyl-d14
	2,4-Dimethylphenol		Hexachloroethane		
✓	2,4-Dinitrophenol		Indeno[1,2,3-cd]pyrene		
	2,4-Dinitrotoluene		Isophorone		
	2,6-Dinitrotoluene		Naphthalene		
	2-Chloronaphthalene		Nitrobenzene		
	2-Chlorophenol		N-Nitrosodi-n-propylamine		
	2-Methylnaphthalene		N-Nitrosodiphenylamine		
	2-Methylphenol		Pentachlorophenol		
	2-Nitroaniline		Phenanthrene		
	2-Nitrophenol		Phenol		
	3- and/or 4-Methylphenol		Pyrene		
	3,3'-Dichlorobenzidine				
	3-Nitroaniline				
✓	4,6-Dinitro-2-methylphenol		**OLM04.2 TCL addons:**		
	4-Bromophenyl Phenyl Ether		1,1-Biphenyl		
	4-Chloro-3-methylphenol		Atrazine		
	4-Chloroaniline		Benzaldehyde		
	4-Chlorophenyl Phenyl Ether		Caprolactam		
	4-Nitroaniline				
✓	4-Nitrophenol		**NonTCL addons:**		
	Acenaphthene		1,2-Diphenylhydrazine		
	Acenaphthylene		1,4-Dioxane		
	Anthracene		1-Methylnapthalene		
	Benz[a]anthracene		2,3,4,6-Tetrachlorophenol		
	Benzo[a] pyrene		Acetophenone		
	Benzo[b] fluoranthene		Aniline		
	Benzo[g,h,i] perylene		Benzidine		
	Benzo[k] fluoranthene		Benzoic Acid		
	Benzyl alcohol		N-Nitrosodimethylamine		
	Bis(2-chloroethoxy) methane		Pyridine		
	Bis(2-chloroethyl) ether		Tributylphosphate		
	Bis(2-chloroisopropyl) ether				
	Bis(2-ethylhexyl) phthalate				
	Butyl Benzyl Phthalate				
	Carbazole				
	Chrysene				
	Dibenz[a,h]anthracene				
	Dibenzofuran				
	Diethyl Phthalate				
	Dimethyl Phthalate				

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K4018
Client:	WC-Hanford, Inc.	Project:	RC-148
Sequence:	2110104	Instrument:	HP5972C
Matrix:	Solid	Calibration:	1211016

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2110104-TUN1	C110901.D	11/09/12 09:43
Cal Standard	2110104-CAL5	C110902.D	11/09/12 10:16
Cal Standard	2110104-CAL3	C110905.D	11/09/12 12:47
Cal Standard	2110104-CAL4	C110906.D	11/09/12 13:37
Cal Standard	2110104-CAL2	C110907.D	11/09/12 14:27
Cal Standard	2110104-CAL1	C110909.D	11/09/12 16:06
Secondary Cal Check	2110104-SCV1	C110910.D	11/09/12 16:56

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K4018
Client:	WC-Hanford, Inc.	Project:	RC-148
Sequence:	2110105	Instrument:	HP5972C
Matrix:	Solid	Calibration:	1211016

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2110105-TUN1	C111001.D	11/10/12 18:26
Calibration Check	2110105-CCV1	C111002.D	11/10/12 18:51
LCS	L211044-BS2	C111003.D	11/10/12 19:41 ✓
Blank	L211044-BLK2	C111004.D	11/10/12 20:31 ✓
J1R433-A	1211001-01	C111005.D	11/10/12 21:21 ✓
J1R433-A	L211044-MS2	C111006.D	11/10/12 22:10 ✓
J1R433-A	L211044-MSD2	C111007.D	11/10/12 23:00 ✓

GLOSSARY

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection 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. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike 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	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: Manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/18/2012 12:11

J1R433-A
1211001-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
1,2-Dichlorobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
1,3-Dichlorobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
1,4-Dichlorobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4,5-Trichlorophenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4,6-Trichlorophenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4-Dichlorophenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4-Dimethylphenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4-Dinitrophenol	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,4-Dinitrotoluene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2,6-Dinitrotoluene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Chloronaphthalene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Chlorophenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Methylnaphthalene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Methylphenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Nitroaniline	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
2-Nitrophenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
3,3'-Dichlorobenzidine	3460	U	3460	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
3-Nitroaniline	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4,6-Dinitro-2-methylphenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Bromophenyl Phenyl Ether	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Chloro-3-methylphenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Chloroaniline	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Chlorophenyl Phenyl Ether	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
3- and/or 4-Methylphenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Nitroaniline	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
4-Nitrophenol	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Acenaphthene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Acenaphthylene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Anthracene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Benz[a]anthracene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Benzo[a] pyrene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Benzo[b] fluoranthene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Benzo[g,h,i] perylene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Benzo[k] fluoranthene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Bis(2-chloroethoxy) methane	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/18/2012 12:11

J1R433-A
1211001-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Bis(2-chloroisopropyl) ether	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Bis(2-ethylhexyl) phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Butyl Benzyl Phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Carbazole	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Chrysene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Dibenz[a,h]anthracene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Dibenzofuran	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Diethyl Phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Dimethyl Phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Di-n-butyl Phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Di-n-octyl Phthalate	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Fluoranthene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Fluorene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Hexachlorobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Hexachlorobutadiene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Hexachlorocyclopentadiene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Hexachloroethane	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Indeno[1,2,3-cd]pyrene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Isophorone	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Naphthalene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Nitrobenzene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
N-Nitrosodi-n-propylamine	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
N-Nitrosodiphenylamine	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Pentachlorophenol	8660	U	8660	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Phenanthrene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Phenol	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Pyrene	1730	U	1730	ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
TIC:Aldol Condensate 1	**2090**	A, B, D, J		ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
TIC:Aldol Condensate 2	**165000**	A, B, D, J		ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
TIC:Aldol Condensate 3	**893**	A, D, J		ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
TIC:Unknown 1	**674**	D, J		ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
TIC:Unknown 2	**275000**	B, J, D		ug/kg dry	5	L211044	11/05/2012	11/10/2012	8270C
Surrogate: 2-Fluorophenol	*65 %*		*25-121*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*
Surrogate: Phenol-d5	*67 %*		*24-113*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*69 %*		*23-120*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

J1R433-A
1211001-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*77 %*	*30-115*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*32 %*	*19-122*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*75 %*	*18-137*			*L211044*	*11/05/2012*	*11/10/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
Blank (L211044-BLK2)				Prepared: 11/05/2012 Analyzed: 11/10/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg wet						
1,2-Dichlorobenzene	330	U	330	ug/kg wet						
1,3-Dichlorobenzene	330	U	330	ug/kg wet						
1,4-Dichlorobenzene	330	U	330	ug/kg wet						
2,4,5-Trichlorophenol	330	U	330	ug/kg wet						
2,4,6-Trichlorophenol	330	U	330	ug/kg wet						
2,4-Dichlorophenol	330	U	330	ug/kg wet						
2,4-Dimethylphenol	330	U	330	ug/kg wet						
2,4-Dinitrophenol	1650	U	1650	ug/kg wet						
2,4-Dinitrotoluene	330	U	330	ug/kg wet						
2,6-Dinitrotoluene	330	U	330	ug/kg wet						
2-Chloronaphthalene	330	U	330	ug/kg wet						
2-Chlorophenol	330	U	330	ug/kg wet						
2-Methylnaphthalene	330	U	330	ug/kg wet						
2-Methylphenol	330	U	330	ug/kg wet						
2-Nitroaniline	1650	U	1650	ug/kg wet						
2-Nitrophenol	330	U	330	ug/kg wet						
3,3'-Dichlorobenzidine	660	U	660	ug/kg wet						
3-Nitroaniline	1650	U	1650	ug/kg wet						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg wet						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg wet						
4-Chloro-3-methylphenol	330	U	330	ug/kg wet						
4-Chloroaniline	330	U	330	ug/kg wet						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg wet						
3- and/or 4-Methylphenol	330	U	330	ug/kg wet						
4-Nitroaniline	1650	U	1650	ug/kg wet						
4-Nitrophenol	1650	U	1650	ug/kg wet						
Acenaphthene	330	U	330	ug/kg wet						
Acenaphthylene	330	U	330	ug/kg wet						
Anthracene	330	U	330	ug/kg wet						
Benz[a]anthracene	330	U	330	ug/kg wet						
Benzo[a] pyrene	330	U	330	ug/kg wet						
Benzo[b] fluoranthene	330	U	330	ug/kg wet						
Benzo[g,h,i] perylene	330	U	330	ug/kg wet						
Benzo[k] fluoranthene	330	U	330	ug/kg wet						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
Blank (L211044-BLK2)				Prepared: 11/05/2012 Analyzed: 11/10/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg wet						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg wet						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg wet						
Butyl Benzyl Phthalate	330	U	330	ug/kg wet						
Carbazole	330	U	330	ug/kg wet						
Chrysene	330	U	330	ug/kg wet						
Dibenz[a,h]anthracene	330	U	330	ug/kg wet						
Dibenzofuran	330	U	330	ug/kg wet						
Diethyl Phthalate	330	U	330	ug/kg wet						
Dimethyl Phthalate	330	U	330	ug/kg wet						
Di-n-butyl Phthalate	330	U	330	ug/kg wet						
Di-n-octyl Phthalate	330	U	330	ug/kg wet						
Fluoranthene	330	U	330	ug/kg wet						
Fluorene	330	U	330	ug/kg wet						
Hexachlorobenzene	330	U	330	ug/kg wet						
Hexachlorobutadiene	330	U	330	ug/kg wet						
Hexachlorocyclopentadiene	330	U	330	ug/kg wet						
Hexachloroethane	330	U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg wet						
Isophorone	330	U	330	ug/kg wet						
Naphthalene	330	U	330	ug/kg wet						
Nitrobenzene	330	U	330	ug/kg wet						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg wet						
N-Nitrosodiphenylamine	330	U	330	ug/kg wet						
Pentachlorophenol	1650	U	1650	ug/kg wet						
Phenanthrene	330	U	330	ug/kg wet						
Phenol	330	U	330	ug/kg wet						
Pyrene	330	U	330	ug/kg wet						
Unknown 2 TICS	1490	J		ug/kg wet						
Unknown 1	51700	J		ug/kg wet						
Trichloro-1-propene	861	J		ug/kg wet						
Aldol Condensate 2 Rec 11/20/12	31500	A, J		ug/kg wet						
Aldol Condensate 1	914	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1790*			*ug/kg wet*	*2500.0*		*72*	*25-121*		
Surrogate: Phenol-d5	*1900*			*ug/kg wet*	*2500.0*		*76*	*24-113*		
Surrogate: Nitrobenzene-d5	*1060*			*ug/kg wet*	*1666.7*		*64*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C									
Blank (L211044-BLK2)			Prepared: 11/05/2012 Analyzed: 11/10/2012						
Surrogate: 2-Fluorobiphenyl	*1200*		*ug/kg wet*	*1666.7*		*72*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1360*		*ug/kg wet*	*2500.0*		*54*	*19-122*		
Surrogate: p-Terphenyl-d14	*1290*		*ug/kg wet*	*1666.7*		*78*	*18-137*		
LCS (L211044-BS2)			Prepared: 11/05/2012 Analyzed: 11/10/2012						
1,2,4-Trichlorobenzene	1140		ug/kg wet	2000.0		57	45-110		
1,2-Dichlorobenzene	1170		ug/kg wet	2000.0		58	45-105		
1,3-Dichlorobenzene	1130		ug/kg wet	2000.0		56	40-100		
1,4-Dichlorobenzene	1180		ug/kg wet	2000.0		59	35-105		
2,4,5-Trichlorophenol	1240		ug/kg wet	2000.0		62	30-140		
2,4,6-Trichlorophenol	1020		ug/kg wet	2000.0		51	20-110		
2,4-Dichlorophenol	1200		ug/kg wet	2000.0		60	40-110		
2,4-Dimethylphenol	1090		ug/kg wet	2000.0		54	30-105		
2,4-Dinitrophenol	608		ug/kg wet	2000.0		30	25-130		
2,4-Dinitrotoluene	1270		ug/kg wet	2000.0		64	50-115		
2,6-Dinitrotoluene	1340		ug/kg wet	2000.0		67	40-120		
2-Chloronaphthalene	1220		ug/kg wet	2000.0		61	45-115		
2-Chlorophenol	1220		ug/kg wet	2000.0		61	45-105		
2-Methylnaphthalene	1180		ug/kg wet	2000.0		59	45-110		
2-Methylphenol	1230		ug/kg wet	2000.0		62	40-120		
2-Nitroaniline	1470		ug/kg wet	2000.0		73	45-120		
2-Nitrophenol	1200		ug/kg wet	2000.0		60	40-110		
3,3'-Dichlorobenzidine	892		ug/kg wet	2000.0		45	15-130		
3-Nitroaniline	1060		ug/kg wet	2000.0		53	40-130		
4,6-Dinitro-2-methylphenol	972		ug/kg wet	2000.0		49	20-140		
4-Bromophenyl Phenyl Ether	1150		ug/kg wet	2000.0		58	45-115		
4-Chloro-3-methylphenol	1320		ug/kg wet	2000.0		66	35-115		
4-Chloroaniline	683		ug/kg wet	2000.0		34	10-100		
4-Chlorophenyl Phenyl Ether	1210		ug/kg wet	2000.0		60	45-110		
3- and/or 4-Methylphenol	1270		ug/kg wet	2000.0		64	40-120		
4-Nitroaniline	1290		ug/kg wet	2000.0		64	40-130		
4-Nitrophenol	1340		ug/kg wet	2000.0		67	15-140		
Acenaphthene	1260		ug/kg wet	2000.0		63	45-110		
Acenaphthylene	1330		ug/kg wet	2000.0		66	45-115		
Anthracene	1310		ug/kg wet	2000.0		65	45-130		
Benz[a]anthracene	1400		ug/kg wet	2000.0		70	45-130		
Benzo[a] pyrene	1290		ug/kg wet	2000.0		64	45-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C									
LCS (L211044-BS2)			Prepared: 11/05/2012 Analyzed: 11/10/2012						
Benzo[b] fluoranthene	1380		ug/kg wet	2000.0		69	40-130		
Benzo[g,h,i] perylene	1390		ug/kg wet	2000.0		69	45-125		
Benzo[k] fluoranthene	1330		ug/kg wet	2000.0		67	45-125		
Bis(2-chloroethoxy) methane	1220		ug/kg wet	2000.0		61	45-110		
Bis(2-chloroethyl) ether	1220		ug/kg wet	2000.0		61	40-110		
Bis(2-chloroisopropyl) ether	1210		ug/kg wet	2000.0		61	30-115		
Bis(2-ethylhexyl) phthalate	1510		ug/kg wet	2000.0		76	40-145		
Butyl Benzyl Phthalate	1490		ug/kg wet	2000.0		74	50-125		
Carbazole	1550		ug/kg wet	2000.0		77	40-140		
Chrysene	1460		ug/kg wet	2000.0		73	45-130		
Dibenz[a,h]anthracene	1370		ug/kg wet	2000.0		68	45-125		
Dibenzofuran	1320		ug/kg wet	2000.0		66	45-120		
Diethyl Phthalate	1320		ug/kg wet	2000.0		66	50-125		
Dimethyl Phthalate	1250		ug/kg wet	2000.0		62	45-130		
Di-n-butyl Phthalate	1400		ug/kg wet	2000.0		70	50-130		
Di-n-octyl Phthalate	1570		ug/kg wet	2000.0		78	40-150		
Fluoranthene	1370		ug/kg wet	2000.0		68	45-130		
Fluorene	1280		ug/kg wet	2000.0		64	45-120		
Hexachlorobenzene	1250		ug/kg wet	2000.0		62	45-130		
Hexachlorobutadiene	1200		ug/kg wet	2000.0		60	45-105		
Hexachlorocyclopentadiene	750		ug/kg wet	2000.0		38	10-100		
Hexachloroethane	1160		ug/kg wet	2000.0		58	35-110		
Indeno[1,2,3-cd]pyrene	1380		ug/kg wet	2000.0		69	45-130		
Isophorone	1210		ug/kg wet	2000.0		60	40-110		
Naphthalene	1350		ug/kg wet	2000.0		67	40-110		
Nitrobenzene	1180		ug/kg wet	2000.0		59	40-105		
N-Nitrosodi-n-propylamine	1320		ug/kg wet	2000.0		66	30-130		
N-Nitrosodiphenylamine	1310		ug/kg wet	2000.0		66	50-120		
Pentachlorophenol	653		ug/kg wet	2000.0		33	25-120		
Phenanthrene	1370		ug/kg wet	2000.0		69	50-120		
Phenol	1270		ug/kg wet	2000.0		64	40-115		
Pyrene	1440		ug/kg wet	2000.0		72	45-125		
Surrogate: 2-Fluorophenol	*1630*		*ug/kg wet*	*2500.0*		*65*	*25-121*		
Surrogate: Phenol-d5	*1660*		*ug/kg wet*	*2500.0*		*66*	*24-113*		
Surrogate: Nitrobenzene-d5	*1110*		*ug/kg wet*	*1666.7*		*66*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1150*		*ug/kg wet*	*1666.7*		*69*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1000*		*ug/kg wet*	*2500.0*		*40*	*19-122*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
LCS (L211044-BS2)				Prepared: 11/05/2012 Analyzed: 11/10/2012						
Surrogate: p-Terphenyl-d14	*1130*			*ug/kg wet*	*1666.7*		*68*	*18-137*		
Matrix Spike (L211044-MS2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/10/2012						
1,2,4-Trichlorobenzene	1250	D		ug/kg dry	2044.8	1730 U	61	45-110		
1,2-Dichlorobenzene	1200	D		ug/kg dry	2044.8	1730 U	59	45-105		
1,3-Dichlorobenzene	1170	D		ug/kg dry	2044.8	1730 U	57	40-100		
1,4-Dichlorobenzene	1230	D		ug/kg dry	2044.8	1730 U	60	35-105		
2,4,5-Trichlorophenol	1240	D		ug/kg dry	2044.8	1730 U	61	30-140		
2,4,6-Trichlorophenol	1100	D		ug/kg dry	2044.8	1730 U	54	20-110		
2,4-Dichlorophenol	1190	D		ug/kg dry	2044.8	1730 U	58	40-110		
2,4-Dimethylphenol	1110	D		ug/kg dry	2044.8	1730 U	54	30-105		
2,4-Dinitrophenol	50.3	D		ug/kg dry	2044.8	8660 U	2*	25-130		
2,4-Dinitrotoluene	1310	D		ug/kg dry	2044.8	1730 U	64	50-115		
2,6-Dinitrotoluene	1300	D		ug/kg dry	2044.8	1730 U	63	40-120		
2-Chloronaphthalene	1240	D		ug/kg dry	2044.8	1730 U	61	45-115		
2-Chlorophenol	1250	D		ug/kg dry	2044.8	1730 U	61	45-105		
2-Methylnaphthalene	1180	D		ug/kg dry	2044.8	1730 U	58	45-110		
2-Methylphenol	1290	D		ug/kg dry	2044.8	1730 U	63	40-120		
2-Nitroaniline	1300	D		ug/kg dry	2044.8	8660 U	64	45-120		
2-Nitrophenol	1050	D		ug/kg dry	2044.8	1730 U	52	40-110		
3,3'-Dichlorobenzidine	976	D		ug/kg dry	2044.8	3460 U	48	15-130		
3-Nitroaniline	1280	D		ug/kg dry	2044.8	8660 U	63	40-130		
4,6-Dinitro-2-methylphenol	423	D		ug/kg dry	2044.8	1730 U	21	20-140		
4-Bromophenyl Phenyl Ether	1160	D		ug/kg dry	2044.8	1730 U	57	45-115		
4-Chloro-3-methylphenol	1260	D		ug/kg dry	2044.8	1730 U	62	35-115		
4-Chloroaniline	690	D		ug/kg dry	2044.8	1730 U	34	10-100		
4-Chlorophenyl Phenyl Ether	1310	D		ug/kg dry	2044.8	1730 U	64	45-110		
3- and/or 4-Methylphenol	1120	D		ug/kg dry	2044.8	1730 U	55	40-120		
4-Nitroaniline	1250	D		ug/kg dry	2044.8	8660 U	61	40-130		
4-Nitrophenol	933	D		ug/kg dry	2044.8	8660 U	46	15-140		
Acenaphthene	1320	D		ug/kg dry	2044.8	1730 U	65	45-110		
Acenaphthylene	1350	D		ug/kg dry	2044.8	1730 U	66	45-115		
Anthracene	1470	D		ug/kg dry	2044.8	1730 U	72	45-130		
Benz[a]anthracene	1480	D		ug/kg dry	2044.8	1730 U	72	45-130		
Benzo[a] pyrene	1250	D		ug/kg dry	2044.8	1730 U	61	45-130		
Benzo[b] fluoranthene	1430	D		ug/kg dry	2044.8	1730 U	70	40-130		
Benzo[g,h,i] perylene	1100	D		ug/kg dry	2044.8	1730 U	54	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
Matrix Spike (L211044-MS2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/10/2012						
Benzo[k] fluoranthene	1410	D		ug/kg dry	2044.8	1730 U	69	45-125		
Bis(2-chloroethoxy) methane	1140	D		ug/kg dry	2044.8	1730 U	56	45-110		
Bis(2-chloroethyl) ether	1220	D		ug/kg dry	2044.8	1730 U	59	40-110		
Bis(2-chloroisopropyl) ether	1240	D		ug/kg dry	2044.8	1730 U	60	30-115		
Bis(2-ethylhexyl) phthalate	1390	D		ug/kg dry	2044.8	1730 U	68	40-145		
Butyl Benzyl Phthalate	1580	D		ug/kg dry	2044.8	1730 U	77	50-125		
Carbazole	1690	D		ug/kg dry	2044.8	1730 U	83	40-140		
Chrysene	1550	D		ug/kg dry	2044.8	1730 U	76	45-130		
Dibenz[a,h]anthracene	990	D		ug/kg dry	2044.8	1730 U	48	45-125		
Dibenzofuran	1440	D		ug/kg dry	2044.8	1730 U	70	45-120		
Diethyl Phthalate	1430	D		ug/kg dry	2044.8	1730 U	70	50-125		
Dimethyl Phthalate	1330	D		ug/kg dry	2044.8	1730 U	65	45-130		
Di-n-butyl Phthalate	1500	D		ug/kg dry	2044.8	1730 U	73	50-130		
Di-n-octyl Phthalate	1310	D		ug/kg dry	2044.8	1730 U	64	40-150		
Fluoranthene	1480	D		ug/kg dry	2044.8	1730 U	72	45-130		
Fluorene	1420	D		ug/kg dry	2044.8	1730 U	69	45-120		
Hexachlorobenzene	1140	D		ug/kg dry	2044.8	1730 U	56	45-130		
Hexachlorobutadiene	1270	D		ug/kg dry	2044.8	1730 U	62	45-105		
Hexachlorocyclopentadiene	347	D		ug/kg dry	2044.8	1730 U	17	10-100		
Hexachloroethane	1190	D		ug/kg dry	2044.8	1730 U	58	35-110		
Indeno[1,2,3-cd]pyrene	1070	D		ug/kg dry	2044.8	1730 U	52	45-130		
Isophorone	1190	D		ug/kg dry	2044.8	1730 U	58	40-110		
Naphthalene	1350	D		ug/kg dry	2044.8	1730 U	66	40-110		
Nitrobenzene	1140	D		ug/kg dry	2044.8	1730 U	56	40-105		
N-Nitrosodi-n-propylamine	1220	D		ug/kg dry	2044.8	1730 U	60	30-130		
N-Nitrosodiphenylamine	1390	D		ug/kg dry	2044.8	1730 U	68	50-120		
Pentachlorophenol	272	D		ug/kg dry	2044.8	8660 U	13*	25-120		
Phenanthrene	1500	D		ug/kg dry	2044.8	1730 U	74	50-120		
Phenol	1340	D		ug/kg dry	2044.8	1730 U	66	40-115		
Pyrene	1620	D		ug/kg dry	2044.8	1730 U	79	45-125		
Surrogate: 2-Fluorophenol	*1580*			*ug/kg dry*	*2556.0*		*62*	*25-121*		
Surrogate: Phenol-d5	*1740*			*ug/kg dry*	*2556.0*		*68*	*24-113*		
Surrogate: Nitrobenzene-d5	*1110*			*ug/kg dry*	*1704.0*		*65*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1260*			*ug/kg dry*	*1704.0*		*74*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1180*			*ug/kg dry*	*2556.0*		*46*	*19-122*		
Surrogate: p-Terphenyl-d14	*1250*			*ug/kg dry*	*1704.0*		*73*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
Matrix Spike Dup (L211044-MSD2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/10/2012						
1,2,4-Trichlorobenzene	1450	D		ug/kg dry	2068.2	1730 U	70	45-110	14	40
1,2-Dichlorobenzene	1420	D		ug/kg dry	2068.2	1730 U	69	45-105	15	40
1,3-Dichlorobenzene	1330	D		ug/kg dry	2068.2	1730 U	64	40-100	12	40
1,4-Dichlorobenzene	1370	D		ug/kg dry	2068.2	1730 U	66	35-105	10	40
2,4,5-Trichlorophenol	1480	D		ug/kg dry	2068.2	1730 U	71	30-140	16	40
2,4,6-Trichlorophenol	1440	D		ug/kg dry	2068.2	1730 U	70	20-110	25	40
2,4-Dichlorophenol	1480	D		ug/kg dry	2068.2	1730 U	72	40-110	20	40
2,4-Dimethylphenol	1500	D		ug/kg dry	2068.2	1730 U	73	30-105	29	40
2,4-Dinitrophenol	190	D		ug/kg dry	2068.2	8660 U	9*	25-130	116*	40
2,4-Dinitrotoluene	1560	D		ug/kg dry	2068.2	1730 U	75	50-115	16	40
2,6-Dinitrotoluene	1700	D		ug/kg dry	2068.2	1730 U	82	40-120	26	40
2-Chloronaphthalene	1630	D		ug/kg dry	2068.2	1730 U	79	45-115	26	40
2-Chlorophenol	1550	D		ug/kg dry	2068.2	1730 U	75	45-105	20	40
2-Methylnaphthalene	1420	D		ug/kg dry	2068.2	1730 U	69	45-110	17	40
2-Methylphenol	1580	D		ug/kg dry	2068.2	1730 U	76	40-120	19	40
2-Nitroaniline	1790	D		ug/kg dry	2068.2	8660 U	87	45-120	31	40
2-Nitrophenol	1280	D		ug/kg dry	2068.2	1730 U	62	40-110	18	40
3,3'-Dichlorobenzidine	986	D		ug/kg dry	2068.2	3460 U	48	15-130	0.1	40
3-Nitroaniline	1530	D		ug/kg dry	2068.2	8660 U	74	40-130	17	40
4,6-Dinitro-2-methylphenol	708	D		ug/kg dry	2068.2	1730 U	34	20-140	49*	40
4-Bromophenyl Phenyl Ether	1520	D		ug/kg dry	2068.2	1730 U	73	45-115	25	40
4-Chloro-3-methylphenol	1550	D		ug/kg dry	2068.2	1730 U	75	35-115	20	40
4-Chloroaniline	744	D		ug/kg dry	2068.2	1730 U	36	10-100	6	40
4-Chlorophenyl Phenyl Ether	1600	D		ug/kg dry	2068.2	1730 U	77	45-110	19	40
3- and/or 4-Methylphenol	1490	D		ug/kg dry	2068.2	1730 U	72	40-120	27	40
4-Nitroaniline	1710	D		ug/kg dry	2068.2	8660 U	82	40-130	30	40
4-Nitrophenol	1370	D		ug/kg dry	2068.2	8660 U	66	15-140	37	40
Acenaphthene	1730	D		ug/kg dry	2068.2	1730 U	83	45-110	25	40
Acenaphthylene	1740	D		ug/kg dry	2068.2	1730 U	84	45-115	24	40
Anthracene	1800	D		ug/kg dry	2068.2	1730 U	87	45-130	20	40
Benz[a]anthracene	1850	D		ug/kg dry	2068.2	1730 U	90	45-130	21	40
Benzo[a] pyrene	1570	D		ug/kg dry	2068.2	1730 U	76	45-130	22	40
Benzo[b] fluoranthene	1820	D		ug/kg dry	2068.2	1730 U	88	40-130	23	40
Benzo[g,h,i] perylene	1290	D		ug/kg dry	2068.2	1730 U	62	45-125	15	40
Benzo[k] fluoranthene	1720	D		ug/kg dry	2068.2	1730 U	83	45-125	19	40
Bis(2-chloroethoxy) methane	1520	D		ug/kg dry	2068.2	1730 U	73	45-110	27	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/18/2012 12:11

Semivolatile Organic Compounds by SW846 8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211044 - SW 3540C										
Matrix Spike Dup (L211044-MSD2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/10/2012						
Bis(2-chloroethyl) ether	1290	D		ug/kg dry	2068.2	1730 U	62	40-110	5	40
Bis(2-chloroisopropyl) ether	1400	D		ug/kg dry	2068.2	1730 U	68	30-115	12	40
Bis(2-ethylhexyl) phthalate	1800	D		ug/kg dry	2068.2	1730 U	87	40-145	24	40
Butyl Benzyl Phthalate	1990	D		ug/kg dry	2068.2	1730 U	96	50-125	22	40
Carbazole	2080	D		ug/kg dry	2068.2	1730 U	101	40-140	19	40
Chrysene	1870	D		ug/kg dry	2068.2	1730 U	91	45-130	18	40
Dibenz[a,h]anthracene	1280	D		ug/kg dry	2068.2	1730 U	62	45-125	24	40
Dibenzofuran	1750	D		ug/kg dry	2068.2	1730 U	85	45-120	19	40
Diethyl Phthalate	1760	D		ug/kg dry	2068.2	1730 U	85	50-125	20	40
Dimethyl Phthalate	1680	D		ug/kg dry	2068.2	1730 U	81	45-130	22	40
Di-n-butyl Phthalate	1890	D		ug/kg dry	2068.2	1730 U	92	50-130	22	40
Di-n-octyl Phthalate	1780	D		ug/kg dry	2068.2	1730 U	86	40-150	30	40
Fluoranthene	1880	D		ug/kg dry	2068.2	1730 U	91	45-130	23	40
Fluorene	1700	D		ug/kg dry	2068.2	1730 U	82	45-120	17	40
Hexachlorobenzene	1470	D		ug/kg dry	2068.2	1730 U	71	45-130	24	40
Hexachlorobutadiene	1430	D		ug/kg dry	2068.2	1730 U	69	45-105	11	40
Hexachlorocyclopentadiene	366	D		ug/kg dry	2068.2	1730 U	18	10-100	4	40
Hexachloroethane	1450	D		ug/kg dry	2068.2	1730 U	70	35-110	19	40
Indeno[1,2,3-cd]pyrene	1290	D		ug/kg dry	2068.2	1730 U	63	45-130	18	40
Isophorone	1360	D		ug/kg dry	2068.2	1730 U	66	40-110	12	40
Naphthalene	1600	D		ug/kg dry	2068.2	1730 U	77	40-110	16	40
Nitrobenzene	1410	D		ug/kg dry	2068.2	1730 U	68	40-105	19	40
N-Nitrosodi-n-propylamine	1620	D		ug/kg dry	2068.2	1730 U	78	30-130	27	40
N-Nitrosodiphenylamine	1780	D		ug/kg dry	2068.2	1730 U	86	50-120	24	40
Pentachlorophenol	310	D		ug/kg dry	2068.2	8660 U	15*	25-120	12	40
Phenanthrene	1900	D		ug/kg dry	2068.2	1730 U	92	50-120	22	40
Phenol	1430	D		ug/kg dry	2068.2	1730 U	69	40-115	5	40
Pyrene	1970	D		ug/kg dry	2068.2	1730 U	95	45-125	19	40
Surrogate: 2-Fluorophenol	*1800*			*ug/kg dry*	*2585.3*		*69*	*25-121*		
Surrogate: Phenol-d5	*1950*			*ug/kg dry*	*2585.3*		*75*	*24-113*		
Surrogate: Nitrobenzene-d5	*1200*			*ug/kg dry*	*1723.5*		*70*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1400*			*ug/kg dry*	*1723.5*		*81*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1340*			*ug/kg dry*	*2585.3*		*52*	*19-122*		
Surrogate: p-Terphenyl-d14	*1350*			*ug/kg dry*	*1723.5*		*78*	*18-137*		

PREPARATION BENCH SHEET

L211044

Lionville Laboratory

Printed: 11/18/2012 11:53:48AM

00000028

Matrix: Solid **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1201164**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210070-01	8270C TCL SVOC	11/05/2012 22:32	31.2	1				500	Arcadis	TCL plus, Report Soils @LOD
1210070-06	8270C TCL SVOC	11/05/2012 22:32	31.02	1				500	Arcadis	TCL plus, Report Soils @LOD
1210070-10	8270C TCL SVOC	11/05/2012 22:32	30.15	1				500	Arcadis	TCL plus, Report Soils @LOD
1210081-05	8270C TCL SVOC	11/05/2012 22:32	30.05	1				500	Arcadis	TCL plus, Report Soils @LOD
1210081-06	8270C TCL SVOC	11/05/2012 22:32	30.58	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-01	8270C TCL SVOC	11/05/2012 22:32	30.18	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-02	8270C TCL SVOC	11/05/2012 22:32	30.44	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-03	8270C TCL SVOC	11/05/2012 22:32	30.64	1				500	Arcadis	TCL plus, Report Soils @LOD
1211001-01	8270C TCL SVOC	11/05/2012 22:32	30.02	1				500	WC-Hanford, Inc.	see Versions
L211044-BLK1	QC	11/05/2012 22:32	30	1				500		
L211044-BLK2	QC	11/05/2012 22:32	30	1				500		
L211044-BS1	QC	11/05/2012 22:32	30	1	1201082		600	500		
L211044-BS2	QC	11/05/2012 22:32	30	1	1201082		600	500		
L211044-MS1	QC	11/05/2012 22:32	30.96	1	1201082	1210070-10	600	500		
L211044-MS2	QC	11/05/2012 22:32	30.83	1	1201082	1211001-01	600	500		
L211044-MSD1	QC	11/05/2012 22:32	30.35	1	1201082	1210070-10	600	500		
L211044-MSD2	QC	11/05/2012 22:32	30.48	1	1201082	1211001-01	600	500		

add QC
Extracts Relinquished By Date

M 11/18/12
Extracts Received By Date

PREPARATION BENCH SHEET

L211044

Lionville Laboratory

Printed: 11/7/2012 1:21:28PM

00000029

Matrix: Solid

Prepared using: SVOCGCMS - SW 3540C

Surrogate used: 1201164

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210070-01	8270C TCL SVOC	11/05/2012 22:32	31.2	1				500	Arcadis	TCL plus, Report Soils @LOD
1210070-06	8270C TCL SVOC	11/05/2012 22:32	31.02	1				500	Arcadis	TCL plus, Report Soils @LOD
1210070-10	8270C TCL SVOC	11/05/2012 22:32	30.15	1				500	Arcadis	TCL plus, Report Soils @LOD
1210081-05	8270C TCL SVOC	11/05/2012 22:32	30.05	1				500	Arcadis	TCL plus, Report Soils @LOD
1210081-06	8270C TCL SVOC	11/05/2012 22:32	30.58	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-01	8270C TCL SVOC	11/05/2012 22:32	30.18	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-02	8270C TCL SVOC	11/05/2012 22:32	30.44	1				500	Arcadis	TCL plus, Report Soils @LOD
1210086-03	8270C TCL SVOC	11/05/2012 22:32	30.64	1				500	Arcadis	TCL plus, Report Soils @LOD
1211001-01	8270C TCL SVOC	11/05/2012 22:32	30.02	1				500	WC-Hanford, Inc.	see Versions
L211044-BLK1	QC	11/05/2012 22:32	30	1				500		
L211044-BS1	QC	11/05/2012 22:32	30	1	1201082		600	500		
L211044-MS1	QC	11/05/2012 22:32	30.96	1	1201082	1210070-10	600	500		
L211044-MS2	QC	11/05/2012 22:32	30.83	1	1201082	1211001-01	600	500		
L211044-MSD1	QC	11/05/2012 22:32	30.35	1	1201082	1210070-10	600	500		
L211044-MSD2	QC	11/05/2012 22:32	30.48	1	1201082	1211001-01	600	500		

11/7/12 1321

Extracts Relinquished By — Date

11/7/12 1330

Extracts Received By — Date

PCBs

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:18

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R433-A	1211001-01	Soil	10/24/2012 09:41	11/01/2012 09:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-148 K4018
LVL #: 1211001

W.O. #: 60049-001-001-0001-00
Received: 11-01-2012

PCBs

One (1) soil sample was collected on 10-24-2012.

The sample and associated QC samples were extracted 11-05-2012 and analyzed 11-07-2012 and 11-16-2012 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 with exceptions noted on the Sample Receipt Checklist.

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

3. All obtainable surrogate recoveries were within acceptance criteria.

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

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. The samples were 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. Per SW846 Method 8000B, the attached table lists compounds where the %difference or drift was greater than 15%, and the mean across all compounds was used for evaluation of the continuing calibration. Results associated with these compounds are considered to have greater uncertainty.

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.

Iain Daniels
LvL Laboratory Manager

12/13/12
Date

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

Analyte	CCV1 11.06.12 8:09:09 AM		CCV2 11.06.12 3:03:06 PM		CCV3 11.06.12 10:42:34 PM		CCV4 11.07.12 4:29:59 AM		CCV5 11.07.12 9:39:41 AM		CCV6 11.07.12 6:27:20 PM		CCV7 11.08.12 2:10:30 AM		CCV8 11.08.12 9:54:45 AM	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)																
Aroclor 1016-1														16.7		
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1								15.6		17.8		19.4		21.0		24.3
Aroclor 1260-2														15.8		19.2
Aroclor 1260-3														16.3		19.2
Aroclor 1260-4										16.1		17.5		19.8		23.0
Aroclor 1260-5										18.2		19.4		21.1		25.5
Mean %D or %Drift	2.6	3.3	3.2	5.1	6.1	7.6	~~7.5~~ 5.2	9.0	7.5	10.7	7.4	12.0	7.9	14.6	9.2	15.6

S211.07.12

Sample results reported from affected CCV:

CCV1: L211016-BIK1, BS1, MS2, MSD2, 1211014-01, 02, 03

CCV2: L210259-BIK1, BS1, MS1, MSD1, 1210074-01, 02, 03, 04, 05, 06

CCV3: 1210074-07, 08, 09, 10, 11, 12, 13

CCV4: 1210080-01, 02, 03, 04, L211016-MSD1, MS1

CCV5: L211043-BIK1, BS1, MS1, MSD1, 1210083-01, 02, 03, 04, 05, 1210032-06 (DF10)

CCV6: 1210083-06, 07, 08, 09, 10, 11, 12, 13, 15, 16

CCV7: L210262-BIK1, BS1, MS1, MSD1, 1210078-01, 02, 03, 04, 05, 06

CCV8: 1210078-07, 08

8082A PCBs

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

Analyte	CCV1 11.15.12 1:45:36 PM		CCV2 11.16.12 7:30:29 AM		CCV3 11.16.12 11:32:37 AM		CCV4 11.16.12 2:53:08 PM		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)	19.5	15.9	21.5	21.6	-16.0		-24.0	-20.7								
Aroclor 1016-1		18.4		21.6												
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1				18.2												
Aroclor 1260-2																
Aroclor 1260-3																
Aroclor 1260-4																
Aroclor 1260-5																
Mean %D or %Drift	6.7	7.5	8.6	12.8	1.0	5.4	-1.9	3.2								

Sample results reported from affected CCV:

CCV1: 1211001-01, L211043-MS2, MSD2

CCV2: 1211002-01, L211043-MS3, MSD3

CCV3: 1211001-01, L211043-MS2, MSD2

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:18

J1R433-A
1211001-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1221	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1232	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1242	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1248	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1254	**36.4**		14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1260	**11.3**	J	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1262	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Aroclor 1268	14.0	U	14.0	ug/kg dry	1	L211043	11/05/2012	11/16/2012	8082
Surrogate: Decachlorobiphenyl	*86 %*		*43-144*			*L211043*	*11/05/2012*	*11/16/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*94 %*		*52-141*			*L211043*	*11/05/2012*	*11/16/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/20/2012 20:18

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 L211043 - SW 3540C										
Blank (L211043-BLK1)				Prepared: 11/05/2012 Analyzed: 11/07/2012						
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	*39.6*			*ug/kg wet*	*33.333*		*119*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.9*			*ug/kg wet*	*33.337*		*108*	*52-141*		
LCS (L211043-BS1)				Prepared: 11/05/2012 Analyzed: 11/07/2012						
Aroclor 1016	168		13.3	ug/kg wet	166.67		101	50-138		
Aroclor 1260	204		13.3	ug/kg wet	166.67		123	50-148		
Surrogate: Decachlorobiphenyl	*38.9*			*ug/kg wet*	*33.333*		*117*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.5*			*ug/kg wet*	*33.337*		*106*	*52-141*		
Matrix Spike (L211043-MS2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/16/2012						
Aroclor 1016	169		13.8	ug/kg dry	172.92	14.0 U	98	50-138		
Aroclor 1260	193		13.8	ug/kg dry	172.92	11.3	105	50-148		
Surrogate: Decachlorobiphenyl	*28.5*			*ug/kg dry*	*34.584*		*82*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.7*			*ug/kg dry*	*34.588*		*92*	*52-141*		
Matrix Spike Dup (L211043-MSD2)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/16/2012						
Aroclor 1016	143		13.9	ug/kg dry	174.53	14.0 U	82	50-138	17	40
Aroclor 1260	159		13.9	ug/kg dry	174.53	11.3	85	50-148	22	40
Surrogate: Decachlorobiphenyl	*23.4*			*ug/kg dry*	*34.906*		*67*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*26.5*			*ug/kg dry*	*34.909*		*76*	*52-141*		

PREPARATION BENCH SHEET

L211043

Lionville Laboratory

Printed: 11/6/2012 4:01:16PM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1201060**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210083-01	8082 PCBs	11/05/2012 20:58	30.84	10				250	WC-Hanford, Inc.	
1210083-02	8082 PCBs	11/05/2012 20:58	30.68	10				250	WC-Hanford, Inc.	
1210083-03	8082 PCBs	11/05/2012 20:58	30.6	10				250	WC-Hanford, Inc.	
1210083-04	8082 PCBs	11/05/2012 20:58	31.02	10				250	WC-Hanford, Inc.	
1210083-05	8082 PCBs	11/05/2012 20:58	30.92	10				250	WC-Hanford, Inc.	
1210083-06	8082 PCBs	11/05/2012 20:58	30.46	10				250	WC-Hanford, Inc.	
1210083-07	8082 PCBs	11/05/2012 20:58	30.21	10				250	WC-Hanford, Inc.	
1210083-08	8082 PCBs	11/05/2012 20:58	30.07	10				250	WC-Hanford, Inc.	
1210083-09	8082 PCBs	11/05/2012 20:58	30.43	10				250	WC-Hanford, Inc.	
1210083-10	8082 PCBs	11/05/2012 20:58	30.1	10				250	WC-Hanford, Inc.	
1210083-11	8082 PCBs	11/05/2012 20:58	30.43	10				250	WC-Hanford, Inc.	
1210083-12	8082 PCBs	11/05/2012 20:58	31.21	10				250	WC-Hanford, Inc.	
1210083-13	8082 PCBs	11/05/2012 20:58	30.11	10				250	WC-Hanford, Inc.	
1210083-15	8082 PCBs	11/05/2012 20:58	30.66	10				250	WC-Hanford, Inc.	
1210083-16	8082 PCBs	11/05/2012 20:58	30.52	10				250	WC-Hanford, Inc.	
1211001-01	8082 PCBs	11/05/2012 20:58	30	10				250	WC-Hanford, Inc.	
1211002-01	8082 PCBs	11/05/2012 20:58	1.13	10				250	WC-Hanford, Inc.	
L211043-BLK1	QC	11/05/2012 20:58	30	10				250		
L211043-BS1	QC	11/05/2012 20:58	30	10	1200902		250	250		
L211043-MS1	QC	11/05/2012 20:58	30.63	10	1200902	1210083-01	250	250		

Cu lot # B10X036
Screened 11.06.12 SZ

11/6/12 1601
Extracts Relinquished By Date

11/06/12 16:05
Extracts Received By Date

PREPARATION BENCH SHEET

L211043

Lionville Laboratory

Printed: 11/6/2012 4:01:16PM

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 1201060

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
L211043-MS2	QC	11/05/2012 20:58	30.38	10	1200902	1211001-01	250	250		
L211043-MS3	QC	11/05/2012 20:58	1.06	10	1200902	1211002-01	250	250		
L211043-MSD1	QC	11/05/2012 20:58	31.02	10	1200902	1210083-01	250	250		
L211043-MSD2	QC	11/05/2012 20:58	30.1	10	1200902	1211001-01	250	250		
L211043-MSD3	QC	11/05/2012 20:58	1.09	10	1200902	1211002-01	250	250		

Cu lot # B10X036
Scleaned 11/06/12
SZ

Extracts Relinquished By — Date: 11/6/12 1601

Extracts Received By — Date: 11.06.12 16:05

PAHs

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-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/16/2012 05:02

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R433-A	1211001-01	Soil	10/24/2012 09:41	11/01/2012 09:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-148 K4018
LVL #: 1211001

W.O. #: 60049-001-001-0001-00
Date Received: 11-01-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 10-24-2012.

The sample and associated QC samples were extracted 11-04-2012 and analyzed 11-06-2012 and 11-07-2012 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 with exceptions noted on the Sample Receipt Checklist.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The sample was reported on a dry weight basis.
8. The 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.
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 data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

12/13/12
Date

r:\group\data\2012\pah 8310\wc hanford\1211001alm.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

264 Welsh Pool Road
Exton, PA 19341
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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/16/2012 05:02

J1R433-A
1211001-01 (Soil)

Lionville Laboratory

Polynuclear Aromatic Compounds by SW846 8310

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Naphthalene	**1.91**	J	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Acenaphthylene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Acenaphthene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Fluorene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Phenanthrene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Anthracene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Fluoranthene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Indeno[1,2,3-cd]pyrene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Pyrene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Benz[a]anthracene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Chrysene	**1.06**	J	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Benzo[b] fluoranthene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Benzo[k] fluoranthene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Benzo[a] pyrene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Dibenz[a,h]anthracene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Benzo[g,h,i] perylene	3.46	U	3.46	ug/kg dry	1	L211026	11/04/2012	11/07/2012	8310
Surrogate: Triphenylene	*96 %*		*68-129*			*L211026*	*11/04/2012*	*11/07/2012*	*8310*

264 Welsh Pool Road
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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/16/2012 05:02

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 L211026 - SW 3540C										
Blank (L211026-BLK1)				Prepared: 11/04/2012 Analyzed: 11/06/2012						
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	3.33	U	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	*181*			*ug/kg wet*	*166.67*		*108*	*68-129*		
LCS (L211026-BS1)				Prepared: 11/04/2012 Analyzed: 11/06/2012						
Naphthalene	116		3.33	ug/kg wet	166.67		69	0-127		
Acenaphthylene	139		3.33	ug/kg wet	166.67		83	50-140		
Acenaphthene	138		3.33	ug/kg wet	166.67		83	17-139		
Fluorene	139		3.33	ug/kg wet	166.67		83	28-145		
Phenanthrene	140		3.33	ug/kg wet	166.67		84	30-152		
Anthracene	139		3.33	ug/kg wet	166.67		84	19-171		
Fluoranthene	142		3.33	ug/kg wet	166.67		85	34-159		
Indeno[1,2,3-cd]pyrene	144		3.33	ug/kg wet	166.67		86	31-156		
Pyrene	143		3.33	ug/kg wet	166.67		86	33-152		
Benz[a]anthracene	150		3.33	ug/kg wet	166.67		90	32-157		
Chrysene	143		3.33	ug/kg wet	166.67		86	31-159		
Benzo[b] fluoranthene	151		3.33	ug/kg wet	166.67		90	33-164		
Benzo[k] fluoranthene	150		3.33	ug/kg wet	166.67		90	28-161		
Benzo[a] pyrene	136		3.33	ug/kg wet	166.67		82	29-149		
Dibenz[a,h]anthracene	153		3.33	ug/kg wet	166.67		92	27-153		
Benzo[g,h,i] perylene	147		3.33	ug/kg wet	166.67		88	32-157		
Surrogate: Triphenylene	*146*			*ug/kg wet*	*166.67*		*88*	*68-129*		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K4018	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	11/16/2012 05:02

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 L211026 - SW 3540C									
Matrix Spike (L211026-MS2)		**Source: 1211001-01**	Prepared: 11/04/2012 Analyzed: 11/07/2012						
Naphthalene	136	3.50	ug/kg dry	174.94	1.91	77	0-127		
Acenaphthylene	133	3.50	ug/kg dry	174.94	3.46 U	76	50-140		
Acenaphthene	129	3.50	ug/kg dry	174.94	3.46 U	74	17-139		
Fluorene	142	3.50	ug/kg dry	174.94	3.46 U	81	28-145		
Phenanthrene	146	3.50	ug/kg dry	174.94	3.46 U	83	30-152		
Anthracene	143	3.50	ug/kg dry	174.94	3.46 U	82	19-171		
Fluoranthene	147	3.50	ug/kg dry	174.94	3.46 U	84	34-159		
Indeno[1,2,3-cd]pyrene	148	3.50	ug/kg dry	174.94	3.46 U	84	31-156		
Pyrene	144	3.50	ug/kg dry	174.94	3.46 U	82	33-152		
Benz[a]anthracene	152	3.50	ug/kg dry	174.94	3.46 U	87	32-157		
Chrysene	141	3.50	ug/kg dry	174.94	1.06	80	31-159		
Benzo[b] fluoranthene	152	3.50	ug/kg dry	174.94	3.46 U	87	33-164		
Benzo[k] fluoranthene	152	3.50	ug/kg dry	174.94	3.46 U	87	28-161		
Benzo[a] pyrene	143	3.50	ug/kg dry	174.94	3.46 U	82	29-149		
Dibenz[a,h]anthracene	154	3.50	ug/kg dry	174.94	3.46 U	88	27-153		
Benzo[g,h,i] perylene	145	3.50	ug/kg dry	174.94	3.46 U	83	32-157		
Surrogate: Triphenylene	*188*		*ug/kg dry*	*174.94*		*108*	*68-129*		
Matrix Spike Dup (L211026-MSD2)		**Source: 1211001-01**	Prepared: 11/04/2012 Analyzed: 11/07/2012						
Naphthalene	141	3.45	ug/kg dry	172.69	1.91	80	0-127	5	40
Acenaphthylene	144	3.45	ug/kg dry	172.69	3.46 U	84	50-140	10	40
Acenaphthene	136	3.45	ug/kg dry	172.69	3.46 U	79	17-139	7	40
Fluorene	150	3.45	ug/kg dry	172.69	3.46 U	87	28-145	7	40
Phenanthrene	154	3.45	ug/kg dry	172.69	3.46 U	89	30-152	7	40
Anthracene	152	3.45	ug/kg dry	172.69	3.46 U	88	19-171	7	40
Fluoranthene	156	3.45	ug/kg dry	172.69	3.46 U	90	34-159	7	40
Indeno[1,2,3-cd]pyrene	153	3.45	ug/kg dry	172.69	3.46 U	88	31-156	5	40
Pyrene	151	3.45	ug/kg dry	172.69	3.46 U	87	33-152	6	40
Benz[a]anthracene	159	3.45	ug/kg dry	172.69	3.46 U	92	32-157	6	40
Chrysene	160	3.45	ug/kg dry	172.69	1.06	92	31-159	14	40
Benzo[b] fluoranthene	161	3.45	ug/kg dry	172.69	3.46 U	93	33-164	7	40
Benzo[k] fluoranthene	160	3.45	ug/kg dry	172.69	3.46 U	93	28-161	6	40
Benzo[a] pyrene	152	3.45	ug/kg dry	172.69	3.46 U	88	29-149	8	40
Dibenz[a,h]anthracene	160	3.45	ug/kg dry	172.69	3.46 U	93	27-153	6	40
Benzo[g,h,i] perylene	154	3.45	ug/kg dry	172.69	3.46 U	89	32-157	7	40
Surrogate: Triphenylene	*182*		*ug/kg dry*	*172.69*		*105*	*68-129*		

PREPARATION BENCH SHEET

L211026

Lionville Laboratory

Printed: 11/6/2012 12:25:22PM

00000048

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
1210083-01	8310 PAH	11/04/2012 10:56	30.33	5				50	WC-Hanford, Inc.	
1210083-02	8310 PAH	11/04/2012 10:56	30	5				50	WC-Hanford, Inc.	
1210083-03	8310 PAH	11/04/2012 10:56	30.86	5				50	WC-Hanford, Inc.	
1210083-04	8310 PAH	11/04/2012 10:56	30.07	5				50	WC-Hanford, Inc.	
1210083-05	8310 PAH	11/04/2012 10:56	30.77	5				50	WC-Hanford, Inc.	
1210083-06	8310 PAH	11/04/2012 10:56	30.14	5				50	WC-Hanford, Inc.	
1210083-07	8310 PAH	11/04/2012 10:56	31.05	5				50	WC-Hanford, Inc.	
1210083-08	8310 PAH	11/04/2012 10:56	30.86	5				50	WC-Hanford, Inc.	
1210083-09	8310 PAH	11/04/2012 10:56	31.37	5				50	WC-Hanford, Inc.	
1210083-10	8310 PAH	11/04/2012 10:56	30.5	5				50	WC-Hanford, Inc.	
1210083-11	8310 PAH	11/04/2012 10:56	30.5	5				50	WC-Hanford, Inc.	
1210083-12	8310 PAH	11/04/2012 10:56	30.17	5				50	WC-Hanford, Inc.	
1210083-13	8310 PAH	11/04/2012 10:56	30.35	5				50	WC-Hanford, Inc.	
1210083-14	8310 PAH	11/04/2012 10:56	30.43	5				50	WC-Hanford, Inc.	
1210083-15	8310 PAH	11/04/2012 10:56	30.44	5				50	WC-Hanford, Inc.	
1210083-16	8310 PAH	11/04/2012 10:56	30.27	5				50	WC-Hanford, Inc.	
1211001-01	8310 PAH	11/04/2012 10:56	30.3	5				50	WC-Hanford, Inc.	
L211026-BLK1	QC	11/04/2012 10:56	30	5				50		
L211026-BS1	QC	11/04/2012 10:56	30	5	1200963		50	50		
L211026-BSD1	QC	11/04/2012 10:56	30	5	1200963		50	50		

Extracts Relinquished By — Date: 11/6/12 1225

Extracts Received By — Date: 11-6-12

PREPARATION BENCH SHEET

L211026

Lionville Laboratory

Printed: 11/6/2012 12:25:22PM

00000049

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
L211026-MS1	QC	11/04/2012 10:56	30.43	5	1200963	1210083-01	50	50		
L211026-MS2	QC	11/04/2012 10:56	30.03	5	1200963	1211001-01	50	50		
L211026-MSD1	QC	11/04/2012 10:56	30.18	5	1200963	1210083-01	50	50		
L211026-MSD2	QC	11/04/2012 10:56	30.42	5	1200963	1211001-01	50	50		

11/6/12 1225

Extracts Relinquished By — Date

CC 11-6-12

Extracts Received By — Date

METALS

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R433-A	1211001-01	Soil	10/24/2012 09:41	11/01/2012 09:50

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-148
LVL#: 1211001
SDG/SAF#: K4018/RC-148

W.O.#: 60049-001-001-0001-00
Date Received: 11-01-12

METALS

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

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

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

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

   All samples were analyzed and reported with 3-fold dilutions for ICP metals due to sample matrix.

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.

7. The preparation/method blank L211045-BLK1 result for 1 analyte was outside method criteria and above the client's RDL.

   a). The MB result for Aluminum was greater than client's RDL, however the method blank for Aluminum does not exceed 5% of the measured concentration present in the associated samples. The sample results for Aluminum were reported herein "uncorrected" for the levels found in the MB.

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

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

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

10. The matrix spike (MS) recoveries for 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 levels for the following analytes: Aluminum, Antimony, Calcium, Iron, Manganese, and Silicon.

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Mercury and Nickel 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

11/18/12
Date

alm/11-014mbhg%

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

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-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

J1R433-A
1211001-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**8600**		13.6	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Antimony	1.63	U	1.63	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Arsenic	**2.65**	B	2.72	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Barium	**86.3**		1.36	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Beryllium	**0.336**	B	0.543	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Boron	**1.86**	B	5.43	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Cadmium	0.543	U	0.543	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Calcium	**4170**		272	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Chromium	**10.4**		0.543	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Cobalt	**7.04**		5.43	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Copper	**12.3**		2.72	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Iron	**21900**		54.3	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Lead	**10.2**		1.36	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Lithium	**7.31**		6.79	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Magnesium	**4340**		204	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Manganese	**320**		13.6	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Molybdenum	5.43	U	5.43	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Nickel	**12.3**		10.9	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Potassium	**1090**		1090	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Selenium	0.815	U	0.815	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Silicon	**211**		5.43	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Silver	0.543	U	0.543	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Sodium	**201**		136	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Uranium	54.3	U	54.3	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Vanadium	**53.6**		6.79	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Zinc	**53.3**		27.2	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Zirconium	**24.4**		6.79	mg/kg dry	3	L211045	11/06/2012	11/07/2012	6010B
Mercury	**0.0112**	B	0.0249	mg/kg dry	1	L211028	11/05/2012	11/07/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

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 L211028 - SW 7471A Prep										
Blank (L211028-BLK1)				Prepared: 11/05/2012 Analyzed: 11/07/2012						
Mercury	0.0250	U	0.0250	mg/kg wet						
Duplicate (L211028-DUP1)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/07/2012						
Mercury	0.0185	B	0.0278	mg/kg dry		0.0112			49.4*	20
Matrix Spike (L211028-MS1)		**Source: 1211001-01**		Prepared: 11/05/2012 Analyzed: 11/07/2012						
Mercury	0.171		0.0249	mg/kg dry	0.13825	0.0112	116	75-125		20
Reference (L211028-SRM1)				Prepared: 11/05/2012 Analyzed: 11/07/2012						
Mercury	1.27		0.0290	mg/kg wet	1.2900		98.6	62.6-138		
Batch L211045 - SW 3050B										
Blank (L211045-BLK1)				Prepared: 11/06/2012 Analyzed: 11/07/2012						
Aluminum	4.73		4.39	mg/kg wet						
Antimony	0.526	U	0.526	mg/kg wet						
Arsenic	0.877	U	0.877	mg/kg wet						
Barium	0.439	U	0.439	mg/kg wet						
Beryllium	0.175	U	0.175	mg/kg wet						
Boron	1.75	U	1.75	mg/kg wet						
Cadmium	0.175	U	0.175	mg/kg wet						
Calcium	9.37	B	87.7	mg/kg wet						
Chromium	0.175	U	0.175	mg/kg wet						
Cobalt	1.75	U	1.75	mg/kg wet						
Copper	0.877	U	0.877	mg/kg wet						
Iron	17.5	U	17.5	mg/kg wet						
Lead	0.439	U	0.439	mg/kg wet						
Lithium	2.19	U	2.19	mg/kg wet						
Magnesium	4.55	B	65.8	mg/kg wet						
Manganese	4.39	U	4.39	mg/kg wet						
Molybdenum	1.75	U	1.75	mg/kg wet						
Nickel	3.51	U	3.51	mg/kg wet						
Potassium	351	U	351	mg/kg wet						
Selenium	0.263	U	0.263	mg/kg wet						
Silicon	1.75	U	1.75	mg/kg wet						
Silver	0.175	U	0.175	mg/kg wet						
Sodium	43.9	U	43.9	mg/kg wet						
Uranium	17.5	U	17.5	mg/kg wet						
Vanadium	2.19	U	2.19	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

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 L211045 - SW 3050B										
Blank (L211045-BLK1)				Prepared: 11/06/2012 Analyzed: 11/07/2012						
Zinc	8.77	U	8.77	mg/kg wet						
Zirconium	2.19	U	2.19	mg/kg wet						
Duplicate (L211045-DUP1)		**Source: 1211001-01**		Prepared: 11/06/2012 Analyzed: 11/07/2012						
Aluminum	8810		13.8	mg/kg dry		8600			2.43	20
Antimony	1.66	U	1.66	mg/kg dry		1.63 U				20
Arsenic	2.67	B	2.76	mg/kg dry		2.65			0.976	20
Barium	90.3		1.38	mg/kg dry		86.3			4.59	20
Beryllium	0.355	B	0.553	mg/kg dry		0.336			5.63	20
Boron	1.92	B	5.53	mg/kg dry		1.86			2.87	20
Cadmium	0.553	U	0.553	mg/kg dry		0.543 U				20
Calcium	4450		276	mg/kg dry		4170			6.57	20
Chromium	12.0		0.553	mg/kg dry		10.4			14.2	20
Cobalt	6.96		5.53	mg/kg dry		7.04			1.20	20
Copper	13.2		2.76	mg/kg dry		12.3			7.23	20
Iron	22800		55.3	mg/kg dry		21900			4.02	20
Lead	9.93		1.38	mg/kg dry		10.2			2.16	20
Lithium	6.64	B	6.91	mg/kg dry		7.31			9.65	20
Magnesium	3920		207	mg/kg dry		4340			10.3	20
Manganese	324		13.8	mg/kg dry		320			1.40	20
Molybdenum	5.53	U	5.53	mg/kg dry		5.43 U				20
Nickel	9.40	B	11.1	mg/kg dry		12.3			26.5*	20
Potassium	1150		1110	mg/kg dry		1090			4.63	20
Selenium	0.829	U	0.829	mg/kg dry		0.815 U				20
Silicon	255		5.53	mg/kg dry		211			19.2	20
Silver	0.553	U	0.553	mg/kg dry		0.543 U				20
Sodium	220		138	mg/kg dry		201			8.64	20
Uranium	55.3	U	55.3	mg/kg dry		54.3 U				20
Vanadium	55.8		6.91	mg/kg dry		53.6			4.14	20
Zinc	54.9		27.6	mg/kg dry		53.3			3.01	20
Zirconium	25.4		6.91	mg/kg dry		24.4			4.29	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

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 L211045 - SW 3050B									
Matrix Spike (L211045-MS1)		**Source: 1211001-01**	Prepared: 11/06/2012 Analyzed: 11/07/2012						
Aluminum	11100	14.1	mg/kg dry	187.62	8600	1350*	75-125		
Antimony	14.5	1.69	mg/kg dry	46.905	1.63 U	30.8*	75-125		
Arsenic	163	2.81	mg/kg dry	187.62	2.65	85.3	75-125		
Barium	262	1.41	mg/kg dry	187.62	86.3	93.6	75-125		
Beryllium	4.44	0.563	mg/kg dry	4.6905	0.336	87.4	75-125		
Boron	82.0	5.63	mg/kg dry	93.810	1.86	85.4	75-125		
Cadmium	4.38	0.563	mg/kg dry	4.6905	0.543 U	93.4	75-125		
Calcium	7440	281	mg/kg dry	2345.2	4170	139*	75-125		
Chromium	26.8	0.563	mg/kg dry	18.762	10.4	87.3	75-125		
Cobalt	47.0	5.63	mg/kg dry	46.905	7.04	85.2	75-125		
Copper	33.7	2.81	mg/kg dry	23.452	12.3	91.0	75-125		
Iron	23700	56.3	mg/kg dry	93.810	21900	1910*	75-125		
Lead	50.3	1.41	mg/kg dry	46.905	10.2	85.7	75-125		
Lithium	92.4	7.04	mg/kg dry	93.810	7.31	90.7	75-125		
Magnesium	6640	211	mg/kg dry	2345.2	4340	98.1	75-125		
Manganese	416	14.1	mg/kg dry	46.905	320	206*	75-125		
Molybdenum	80.0	5.63	mg/kg dry	93.810	5.43 U	85.3	75-125		
Nickel	50.1	11.3	mg/kg dry	46.905	12.3	80.6	75-125		
Potassium	3330	1130	mg/kg dry	2345.2	1090	95.5	75-125		
Selenium	161	0.844	mg/kg dry	187.62	0.815 U	85.8	75-125		
Silicon	381	5.63	mg/kg dry	93.810	211	182*	75-125		
Silver	4.27	0.563	mg/kg dry	4.6905	0.543 U	91.0	75-125		
Sodium	2510	141	mg/kg dry	2345.2	201	98.2	75-125		
Uranium	388	56.3	mg/kg dry	469.05	54.3 U	82.8	75-125		
Vanadium	97.2	7.04	mg/kg dry	46.905	53.6	93.1	75-125		
Zinc	100	28.1	mg/kg dry	46.905	53.3	99.6	75-125		
Zirconium	420	7.04	mg/kg dry	469.05	24.4	84.4	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 10:58

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 L211045 - SW 3050B									
Post Spike (L211045-PS1)		**Source: 1211001-01**	Prepared: 11/06/2012 Analyzed: 11/07/2012						
Aluminum	152000		ug/L	66000	95000	86.3	75-125		
Antimony	298		ug/L	300.00	6.26	97.3	75-125		
Calcium	98700		ug/L	62400	46000	84.4	75-125		
Iron	334000		ug/L	120000	242000	76.6	75-125		
Manganese	6100		ug/L	3000.0	3530	85.7	75-125		
Silicon	8500		ug/L	6300.0	2330	98.0	75-125		
Reference (L211045-SRM1)			Prepared: 11/06/2012 Analyzed: 11/07/2012						
Aluminum	10500	13.4	mg/kg wet	6670.0		158	0-200.89		
Antimony	35.8	1.61	mg/kg wet	53.000		67.5	0-235.8		
Arsenic	117	2.68	mg/kg wet	114.00		103	82.8-117.54		
Barium	306	1.34	mg/kg wet	307.00		99.7	79.8-120.2		
Beryllium	103	0.536	mg/kg wet	108.00		95.4	82.8-117.6		
Boron	78.9	5.36	mg/kg wet	85.100		92.8	67.5-132.8		
Cadmium	223	0.536	mg/kg wet	225.00		99.3	83.6-116.4		
Calcium	3120	268	mg/kg wet	3360.0		93.0	83.3-116.9		
Chromium	79.7	0.536	mg/kg wet	77.200		103	73.3-126.4		
Cobalt	159	5.36	mg/kg wet	166.00		95.8	80.7-118.7		
Copper	272	2.68	mg/kg wet	271.00		100	80.8-119.2		
Iron	8200	53.6	mg/kg wet	8420.0		97.4	78.6-121.1		
Lead	184	1.34	mg/kg wet	190.00		97.1	81.6-118.4		
Lithium	122	6.70	mg/kg wet	114.00		107	50.9-148.2		
Magnesium	7650	201	mg/kg wet	8570.0		89.3	83.2-116.7		
Manganese	992	13.4	mg/kg wet	965.00		103	69.3-130.5		
Molybdenum	235	5.36	mg/kg wet	235.00		99.8	76.2-123.8		
Nickel	225	10.7	mg/kg wet	221.00		102	79.6-120.8		
Potassium	13600	1070	mg/kg wet	14400		94.7	81.9-118.1		
Selenium	189	0.804	mg/kg wet	187.00		101	75.9-124.6		
Silicon	383	5.36	mg/kg wet	807.00		47.5	0-219.3		
Silver	82.0	0.536	mg/kg wet	83.500		98.2	82.7-117.1		
Sodium	9210	134	mg/kg wet	9730.0		94.6	82.5-117.2		
Vanadium	102	6.70	mg/kg wet	98.700		104	75.9-123.6		
Zinc	197	26.8	mg/kg wet	199.00		99.1	78.4-121.6		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L211045
Date/Time Initiated: 11/6/12 1025
Date/Time Completed: 11/6/12 1640
Analyst: CB
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 93°
BLOCK 1 2 (circle one)
3

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1211001-01		0.58	50		TOT	fine	Brown Sandy		
L211045-DUP1		0.57	50			fine	Brown Sandy		
* MS1	0.5	0.56	50			fine	Brown Sandy		
1211014-01		0.60	50			fine	Brown Sandy		
L211045-DUP2		0.59	50			fine	Brown Sandy		
MS2	0.5	0.61	50			fine	Brown Sandy		
02		0.68	50			fine	Brown Sandy		
03		0.60	50			fine	Brown Sandy		
L211045-BLK1		0.57	50			COARSE	Boiling Chips		
SRM1	*	0.56	50			fine	Pink Loamy		

Spiking IDs / Expiration Date:
MS#: 1201377

LCS#: * 1201014

Reagent IDs:
HNO_3 0000003390
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: 11/7/12

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

* Also spiked 0.250 mL U 1200350
0.250 mL Zr 1200386

Page #:

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: TCB
Date 11/5/12
Start Time/Temp: 1715 | 93°
End Time/Temp: 1745 | 96°

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

Prep Batch: L211028
Worksheet: HG110701
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10mL	50	
0.2 µg/L		0.100		10mL	50	
1.0		0.500		10mL	50	
2.0		1.000		10mL	50	
5.0		2.500		10mL	50	
10.0		5.000		10mL	50	
ICV		0.125	2.5	10mL	50	
CCV		0.250	5.0	10mL	50	
ICB/CCB				10mL	50	
L211028-BLK				0.36	50	
SRM		*	*	0.31	50	
1211001-01				0.38	50	
L211028-Dup1				0.34	50	
MS1		0.5	1.0	0.38	50	
1211014-01				0.34	50	
L211028-Dup2				0.33	50	
MS2		0.5	1.0	0.34	50	
02				0.38	50	
03				0.39	50	
1211017-01				0.33	50	R
L211028-Dup3				0.38	50	⊥
MS3		0.5	1.0	0.32	50	
		TCB 11/5/12				

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	11/5/12 1500
ICV/CCV/LCS	IV 1200532	NA

Reviewed By/Date: [illegible] 11/7/12

se book # 1153 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # ~~*~~ 1201014

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

WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 17:35

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R433-A	1211001-01	Soil	10/24/2012 09:41	11/01/2012 09:50

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-148 K4018
LVL#: 1211001 **Date Received:** 11-01-12

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.

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

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

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

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

12/11/12
Date

njp\i11-001

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
D	Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 17:35

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R433-A (1211001-01) Soil										
%Solids	**95.2**			0.1	% by Weight	1	L211032	11/05/2012 13:10	11/05/2012 13:10	SM2540G
Bromide	1.0	U	1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Chloride	**2.3**	B	1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Nitrate	**4.2**	B	1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Orthophosphate	2.1	U	2.1	10.3	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Sulfate	**41.5**		1.0	5.2	mg/kg dry	1	L211019	11/01/2012 10:40	11/01/2012 20:45	EPA 300.0 (1993)
Nitrate/Nitrite as N	**1.01**		0.10	0.52	mg/kg dry	1	L211017	11/01/2012 10:40	11/02/2012 11:41	EPA 353.2
Hexavalent Chromium	0.21	U	0.21	0.53	mg/kg dry	1	L211061	11/08/2012 15:30	11/08/2012 19:30	SW846 7196A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 17:35

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211017 - Default Prep GenChem										
Blank (L211017-BLK1)				Prepared: 11/01/2012 10:40 Analyzed: 11/02/2012 11:16						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L211017-BS1)				Prepared: 11/01/2012 10:40 Analyzed: 11/02/2012 11:15						
Nitrate/Nitrite as N	5.31	0.10	0.50	mg/kg wet	5.0000		106	90-110		
Duplicate (L211017-DUP3)	**Source: 1211001-01**			Prepared: 11/01/2012 10:40 Analyzed: 11/02/2012 11:42						
Nitrate/Nitrite as N	1.32	0.10	0.52	mg/kg dry		1.01			26.8*	20
Matrix Spike (L211017-MS3)	**Source: 1211001-01**			Prepared: 11/01/2012 10:40 Analyzed: 11/02/2012 11:43						
Nitrate/Nitrite as N	6.34	0.10	0.52	mg/kg dry	5.1689	1.01	103	75-125		
Batch L211019 - Default Prep GenChem										
Blank (L211019-BLK1)				Prepared: 11/01/2012 10:40 Analyzed: 11/01/2012 14:57						
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 (L211019-BS1)				Prepared: 11/01/2012 10:40 Analyzed: 11/01/2012 14:57						
Fluoride	50.4	1.0	5.0	mg/kg wet	50.000		101	80-120		
Chloride	47.7	1.0	5.0	mg/kg wet	50.000		95.4	80-120		
Bromide	48.3	1.0	5.0	mg/kg wet	50.000		96.6	80-120		
Orthophosphate	47.3	2.0	10.0	mg/kg wet	50.000		94.6	80-120		
Sulfate	49.6	1.0	5.0	mg/kg wet	50.000		99.2	80-120		
Nitrate	48.0	1.0	5.0	mg/kg wet	50.000		96.0	80-120		
Nitrite	49.1	1.0	5.0	mg/kg wet	50.000		98.2	80-120		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 17:35

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211019 - Default Prep GenChem										
Duplicate (L211019-DUP3)	**Source: 1211001-01**			Prepared: 11/01/2012 10:40 Analyzed: 11/01/2012 20:45						
Fluoride	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Chloride	2.9 B	1.0	5.2	mg/kg dry		2.3			24.5*	20
Bromide	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Orthophosphate	2.1 U	2.1	10.4	mg/kg dry		2.1 U				20
Sulfate	47.3	1.0	5.2	mg/kg dry		41.5			13.1	20
Nitrate	6.2	1.0	5.2	mg/kg dry		4.2			38.1*	20
Nitrite	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Matrix Spike (L211019-MS3)	**Source: 1211001-01**			Prepared: 11/01/2012 10:40 Analyzed: 11/01/2012 20:45						
Fluoride	52.5	1.0	5.2	mg/kg dry	51.689	1.0 U	102	75-125		
Chloride	53.3	1.0	5.2	mg/kg dry	51.689	2.3	98.8	75-125		
Bromide	51.2	1.0	5.2	mg/kg dry	51.689	1.0 U	99.0	75-125		
Orthophosphate	48.9	2.1	10.3	mg/kg dry	51.689	2.1 U	94.6	75-125		
Sulfate	98.5	1.0	5.2	mg/kg dry	51.689	41.5	110	75-125		
Nitrate	56.0	1.0	5.2	mg/kg dry	51.689	4.2	100	75-125		
Nitrite	51.9	1.0	5.2	mg/kg dry	51.689	1.0 U	100	75-125		
Batch L211032 - % Solids										
Duplicate (L211032-DUP1)	**Source: 1211001-01**			Prepared & Analyzed: 11/05/2012 13:10						
%Solids	95.4		0.1	% by Weight		95.2			0.2	20
Batch L211061 - Default Prep GenChem										
Blank (L211061-BLK1)				Prepared: 11/08/2012 12:20 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	0.20 U	0.20	0.50	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K4018 Project Manager: Joan Kessner	**Reported:** 11/09/2012 17:35

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L211061 - Default Prep GenChem											
LCS (L211061-BS1)					Prepared: 11/08/2012 12:20 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	4.09		0.20	0.50	mg/kg wet	4.0000		102	80-120		
LCS (L211061-BS2)					Prepared: 11/08/2012 12:20 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	995	D	20.0	50.0	mg/kg wet	1133.4		88	80-120		
Duplicate (L211061-DUP2)		**Source: 1211001-01**			Prepared: 11/08/2012 15:30 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	0.21	U	0.21	0.53	mg/kg dry		0.21 U				20
Matrix Spike (L211061-MS3)		**Source: 1211001-01**			Prepared: 11/08/2012 15:30 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	4.91		0.21	0.53	mg/kg dry	4.2027	0.21 U	117	75-125		
Matrix Spike (L211061-MS4)		**Source: 1211001-01**			Prepared: 11/08/2012 15:30 Analyzed: 11/08/2012 19:30						
Hexavalent Chromium	1000	D	21.0	52.5	mg/kg dry	1102.9	0.21 U	91	75-125		