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

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 1/17/13
INITIAL/DATE

COMMENTS:

SDG K4032 SAF-RC-150

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 300 RRLWS – Clean-Out "F" (10 ft depth)

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

21 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 #	1211096
SDG #	K4032
SAF #	RC-150
Date Received	11/20/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	X
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	X
Herbicides	
Metals	X
Inorganics	

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 48 pages.

CHAIN OF CUSTODY

REVISION

Lionville Laboratory Use Only: 121096

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 3AF# RC-150
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: STL TAT: 21 Days

Date Rec'd: 11-20-12 Date Due: 12-11-12

Refrigerator #		A			B			C								
#/Type Container	Liquid	2			2			2								
	Solid	1P			1P			1P								
Volume	Liquid	60			60			60								
	Solid															
Preservatives		1			-			-								
ANALYSES REQUESTED →		ORGANIC						INORG								
		VOA	BNA	Pest/PCB	Herb	PAHs		Metal Hg	CN							
			8270 TCL			8310		METALS								
		Lionville Laboratory Use Only														

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
W Water, WW Waste Water, GW Groundwater, WST Waste, WI Wipe, SO Solid, S Soil, SL Sludge, SE Sediment, PC Paint Chips, O Oil, NAL Non-Aqueous Liquid, L Leachate, A Air, T Tissue, F Fish	01	J1R5L3	✓	✓	OTHER	11-14-12	1125

Special Instructions:

OTHER = Filter wipe DSJ 11/26/12

METALS = HSL + B, Li, Mo, Si, U, Zr

Special Instructions:

11-26-12 1. Sample matrix = wipe; report units = ug/sample (ug/wipe) DSJ

2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	K Hernandez	11/20/12	1550

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-150-034	Page 1 of 1
Collector M. Riddell	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH	**Price Code** 9L **Data Turnaround** 21 Days
Project Designation 300 Area D4 Waste Sites - Other	**Sampling Location** 300 RRLWS - Clean-Out "F" (10 ft depth)		**SAF No.** RC-150	
Ice Chest No. ~~N/A~~ AJ 11-19-12 RCC-08-028	**Field Logbook No.** EL-1663-04	**COA** RRRLWS2600	**Method of Shipment** (Fed Ex) Hand Deliver	
Shipped To ~~EBERLINE SERVICES~~ (LIONVILLE) RJB 11/14/12	**Offsite Property No.** ~~N/A~~ AJ 11-19-12 A120645		**Bill of Lading/Air Bill No.** See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potential~~ Radioactive < DOT Limits AJ 11-19-12

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C RJB	Cool 4C 11/14/12	None						
Type of Container	G/P	~~G~~ P	~~G~~ P	G/P						
No. of Container(s)	1	1	1	* 0						
Volume	60mL	60mL	125mL	60mL						

SAMPLE ANALYSIS	See item (1) in Special Instructions. *	Semi-VOA - 8270A (TCL)	PAHs - 8310	RCF GEA Shipping Screen AJ 11-19-12	RCF 94975					
Sample No. / Matrix * / Sample Date / Sample Time										
J1R5L3 / OTHER / 11/14/2012 / 1125	✓	✓	✓							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TPMC Mike Rudder	11-14-12 14:10	WCH DAVID BECKER David Becker	11/14/12 1410
DAVID BECKER David Becker	11/14/12 1450	1060#3 A. Freier	1450 11-14-12
WCH A. Freier	1020 11-19-12	Fed Ex	
Fed Ex	11-20-12 1550	V. Hernandez VICTOR HERNANDEZ	11-20-12 1550

SPECIAL INSTRUCTIONS
* Trans ship sample designated for RCF Shipping Screen to Lionville [Cooling not maintained].

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

REVIEWED BY CMB DATE 11-19-12

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

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

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford **Date:** 11/20/12
Project/SAF/SOW/Release #: RC-150

LvL Batch #: 1211096 **Sample Custodian:** Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 794106788825
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 3-3 °C		Cooler # RCC-08-028
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A
Person Contacted _____		Date _____	

SEMIVOLATILES

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4032 Project Manager: Joan Kessner	**Reported:** 12/11/2012 13:21

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5L3	1211096-01	Other Solid	11/14/2012 11:25	11/20/2012 15:50

LIONVILLE LABORATORY
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Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-150 K4032
LVL #: 1211096

W.O. #: 60049-001-001-0001-00
Date Received: 11-20-2012

SEMIVOLATILE

One (1) wipe sample was collected on 11-14-2011.

The sample and associated QC samples were extracted 11-28-2012 and analyzed 12-10-2012 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 8270C for Client Specified Semivolatile 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. All results presented in this report are derived from samples that meet LvL's sample acceptance policy.

2. The samples were extracted and analyzed within holding time.

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

4. All obtainable recoveries surrogate recoveries were within QC acceptance criteria.

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

6. Three (3) of one hundred twenty-eight (128) blank spike recoveries were outside QC acceptance criteria. The outside recoveries were biased high. No target compounds were detected in the associated sample, minimal impact on the data.

7. 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.

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

9. 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").

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

Iain Daniels
LvL Laboratory Manager

12/21/12
Date

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: 8.20 CALIBRATION: 121200B

12/10/12 59720

>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		
LYOK Recalculate	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:	K4032
Client:	WC-Hanford, Inc.	Project:	RC-150
Sequence:	2120062	Instrument:	HP5972D
Matrix:	Wipe	Calibration:	1212008

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2120062-TUN1	D121001.D	12/10/12 12:09
Cal Standard	2120062-CAL5	D121002.D	12/10/12 12:51
Cal Standard	2120062-CAL1	D121003.D	12/10/12 14:19
Cal Standard	2120062-CAL2	D121004.D	12/10/12 15:13
Cal Standard	2120062-CAL3	D121005.D	12/10/12 16:06
Cal Standard	2120062-CAL4	D121006.D	12/10/12 16:59
Secondary Cal Check	2120062-SCV1	D121007.D	12/10/12 17:52
LCS	L211239-BS1	D121008.D	12/10/12 18:46
LCS Dup	L211239-BSD1	D121009.D	12/10/12 19:39
Blank	L211239-BLK1	D121010.D	12/10/12 20:32
J1R5L3	1211096-01	D121011.D	12/10/12 21:26

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.

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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

J1R5L3

1211096-01 (Other Solid)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
1,2-Dichlorobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
1,3-Dichlorobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
1,4-Dichlorobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4,5-Trichlorophenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4,6-Trichlorophenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4-Dichlorophenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4-Dimethylphenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4-Dinitrophenol	50.0	U	50.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,4-Dinitrotoluene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2,6-Dinitrotoluene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Chloronaphthalene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Chlorophenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Methylnaphthalene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Methylphenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Nitroaniline	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
2-Nitrophenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
3,3'-Dichlorobenzidine	50.0	U	50.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
3-Nitroaniline	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4,6-Dinitro-2-methylphenol	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Bromophenyl Phenyl Ether	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Chloro-3-methylphenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Chloroaniline	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Chlorophenyl Phenyl Ether	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
3- and/or 4-Methylphenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Nitroaniline	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
4-Nitrophenol	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Acenaphthene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Acenaphthylene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Anthracene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Benz[a]anthracene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Benzo[a] pyrene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Benzo[b] fluoranthene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Benzo[g,h,i] perylene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Benzo[k] fluoranthene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Bis(2-chloroethoxy) methane	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

J1R5L3

1211096-01 (Other Solid)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Bis(2-chloroethyl) ether	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Bis(2-chloroisopropyl) ether	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Bis(2-ethylhexyl) phthalate	**12.8**		10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Butyl Benzyl Phthalate	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Carbazole	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Chrysene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Dibenz[a,h]anthracene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Dibenzofuran	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Diethyl Phthalate	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Dimethyl Phthalate	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Di-n-butyl Phthalate	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Di-n-octyl Phthalate	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Fluoranthene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Fluorene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Hexachlorobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Hexachlorobutadiene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Hexachlorocyclopentadiene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Hexachloroethane	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Indeno[1,2,3-cd]pyrene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Isophorone	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Naphthalene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Nitrobenzene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
N-Nitrosodi-n-propylamine	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
N-Nitrosodiphenylamine	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Pentachlorophenol	25.0	U	25.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Phenanthrene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Phenol	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Pyrene	10.0	U	10.0	ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
TIC:Unknown 1	**3.03**	J		ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
TIC:Unknown 2	**9.62**	J		ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
TIC:Unknown 3	**4.31**	J		ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
TIC:Unknown 4	**7.48**	J		ug/sample	1	L211239	11/28/2012	12/10/2012	8270C
Surrogate: 2-Fluorophenol	*44 %*		*21-100*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*
Surrogate: Phenol-d5	*50 %*		*10-94*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*53 %*		*35-114*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*53 %*		*43-116*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*

LIONVILLE LABORATORY
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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

J1R5L3

1211096-01 (Other Solid)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2,4,6-Tribromophenol	*74 %*	*10-123*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*69 %*	*33-141*			*L211239*	*11/28/2012*	*12/10/2012*	*8270C*

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2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C										
Blank (L211239-BLK1)				Prepared: 11/28/2012 Analyzed: 12/10/2012						
1,2,4-Trichlorobenzene	10.0	U	10.0	ug/sample						
1,2-Dichlorobenzene	10.0	U	10.0	ug/sample						
1,3-Dichlorobenzene	10.0	U	10.0	ug/sample						
1,4-Dichlorobenzene	10.0	U	10.0	ug/sample						
2,4,5-Trichlorophenol	10.0	U	10.0	ug/sample						
2,4,6-Trichlorophenol	10.0	U	10.0	ug/sample						
2,4-Dichlorophenol	10.0	U	10.0	ug/sample						
2,4-Dimethylphenol	10.0	U	10.0	ug/sample						
2,4-Dinitrophenol	50.0	U	50.0	ug/sample						
2,4-Dinitrotoluene	10.0	U	10.0	ug/sample						
2,6-Dinitrotoluene	10.0	U	10.0	ug/sample						
2-Chloronaphthalene	10.0	U	10.0	ug/sample						
2-Chlorophenol	10.0	U	10.0	ug/sample						
2-Methylnaphthalene	10.0	U	10.0	ug/sample						
2-Methylphenol	10.0	U	10.0	ug/sample						
2-Nitroaniline	25.0	U	25.0	ug/sample						
2-Nitrophenol	10.0	U	10.0	ug/sample						
3,3'-Dichlorobenzidine	50.0	U	50.0	ug/sample						
3-Nitroaniline	25.0	U	25.0	ug/sample						
4,6-Dinitro-2-methylphenol	25.0	U	25.0	ug/sample						
4-Bromophenyl Phenyl Ether	10.0	U	10.0	ug/sample						
4-Chloro-3-methylphenol	10.0	U	10.0	ug/sample						
4-Chloroaniline	25.0	U	25.0	ug/sample						
4-Chlorophenyl Phenyl Ether	10.0	U	10.0	ug/sample						
3- and/or 4-Methylphenol	10.0	U	10.0	ug/sample						
4-Nitroaniline	25.0	U	25.0	ug/sample						
4-Nitrophenol	25.0	U	25.0	ug/sample						
Acenaphthene	10.0	U	10.0	ug/sample						
Acenaphthylene	10.0	U	10.0	ug/sample						
Anthracene	10.0	U	10.0	ug/sample						
Benz[a]anthracene	10.0	U	10.0	ug/sample						
Benzo[a] pyrene	10.0	U	10.0	ug/sample						
Benzo[b] fluoranthene	10.0	U	10.0	ug/sample						
Benzo[g,h,i] perylene	10.0	U	10.0	ug/sample						
Benzo[k] fluoranthene	10.0	U	10.0	ug/sample						
Bis(2-chloroethoxy) methane	10.0	U	10.0	ug/sample						

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C										
Blank (L211239-BLK1)				Prepared: 11/28/2012 Analyzed: 12/10/2012						
Bis(2-chloroethyl) ether	10.0	U	10.0	ug/sample						
Bis(2-chloroisopropyl) ether	10.0	U	10.0	ug/sample						
Bis(2-ethylhexyl) phthalate	10.0	U	10.0	ug/sample						
Butyl Benzyl Phthalate	10.0	U	10.0	ug/sample						
Carbazole	10.0	U	10.0	ug/sample						
Chrysene	10.0	U	10.0	ug/sample						
Dibenz[a,h]anthracene	10.0	U	10.0	ug/sample						
Dibenzofuran	10.0	U	10.0	ug/sample						
Diethyl Phthalate	10.0	U	10.0	ug/sample						
Dimethyl Phthalate	10.0	U	10.0	ug/sample						
Di-n-butyl Phthalate	10.0	U	10.0	ug/sample						
Di-n-octyl Phthalate	10.0	U	10.0	ug/sample						
Fluoranthene	10.0	U	10.0	ug/sample						
Fluorene	10.0	U	10.0	ug/sample						
Hexachlorobenzene	10.0	U	10.0	ug/sample						
Hexachlorobutadiene	10.0	U	10.0	ug/sample						
Hexachlorocyclopentadiene	10.0	U	10.0	ug/sample						
Hexachloroethane	10.0	U	10.0	ug/sample						
Indeno[1,2,3-cd]pyrene	10.0	U	10.0	ug/sample						
Isophorone	10.0	U	10.0	ug/sample						
Naphthalene	10.0	U	10.0	ug/sample						
Nitrobenzene	10.0	U	10.0	ug/sample						
N-Nitrosodi-n-propylamine	10.0	U	10.0	ug/sample						
N-Nitrosodiphenylamine	10.0	U	10.0	ug/sample						
Pentachlorophenol	25.0	U	25.0	ug/sample						
Phenanthrene	10.0	U	10.0	ug/sample						
Phenol	10.0	U	10.0	ug/sample						
Pyrene	10.0	U	10.0	ug/sample						
Surrogate: 2-Fluorophenol	*45.8*			*ug/sample*	*75.000*		*61*	*21-100*		
Surrogate: Phenol-d5	*49.2*			*ug/sample*	*75.000*		*66*	*10-94*		
Surrogate: Nitrobenzene-d5	*33.5*			*ug/sample*	*50.000*		*67*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*32.3*			*ug/sample*	*50.000*		*65*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*55.4*			*ug/sample*	*75.000*		*74*	*10-123*		
Surrogate: p-Terphenyl-d14	*42.0*			*ug/sample*	*50.000*		*84*	*33-141*		

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C									
LCS (L211239-BS1)			Prepared: 11/28/2012 Analyzed: 12/10/2012						
1,2,4-Trichlorobenzene	56.7		ug/sample	60.000		95	35-105		
1,2-Dichlorobenzene	52.7		ug/sample	60.000		88	35-100		
1,3-Dichlorobenzene	48.4		ug/sample	60.000		81	30-100		
1,4-Dichlorobenzene	49.4		ug/sample	60.000		82	30-100		
2,4,5-Trichlorophenol	64.5		ug/sample	60.000		108	45-125		
2,4,6-Trichlorophenol	58.8		ug/sample	60.000		98	40-125		
2,4-Dichlorophenol	60.2		ug/sample	60.000		100	40-120		
2,4-Dimethylphenol	41.2		ug/sample	60.000		69	30-110		
2,4-Dinitrophenol	65.1		ug/sample	60.000		108	15-140		
2,4-Dinitrotoluene	54.5		ug/sample	60.000		91	50-120		
2,6-Dinitrotoluene	53.9		ug/sample	60.000		90	50-115		
2-Chloronaphthalene	51.9		ug/sample	60.000		87	40-110		
2-Chlorophenol	52.7		ug/sample	60.000		88	35-115		
2-Methylnaphthalene	56.6		ug/sample	60.000		94	35-105		
2-Methylphenol	52.2		ug/sample	60.000		87	40-110		
2-Nitroaniline	55.3		ug/sample	60.000		92	35-110		
2-Nitrophenol	56.0		ug/sample	60.000		93	30-115		
3,3'-Dichlorobenzidine	44.8		ug/sample	60.000		75	20-150		
3-Nitroaniline	50.4		ug/sample	60.000		84	5-120		
4,6-Dinitro-2-methylphenol	70.3		ug/sample	60.000		117	40-130		
4-Bromophenyl Phenyl Ether	64.2		ug/sample	60.000		107	50-110		
4-Chloro-3-methylphenol	58.6		ug/sample	60.000		98	40-110		
4-Chloroaniline	52.6		ug/sample	60.000		88	10-120		
4-Chlorophenyl Phenyl Ether	57.9		ug/sample	60.000		97	40-120		
3- and/or 4-Methylphenol	50.4		ug/sample	60.000		84	30-110		
4-Nitroaniline	37.0		ug/sample	60.000		62	5-110		
4-Nitrophenol	59.4		ug/sample	60.000		99	5-150		
Acenaphthene	53.1		ug/sample	60.000		88	35-110		
Acenaphthylene	48.2		ug/sample	60.000		80	30-110		
Anthracene	50.8		ug/sample	60.000		85	40-120		
Benz[a]anthracene	50.6		ug/sample	60.000		84	40-120		
Benzo[a] pyrene	51.0		ug/sample	60.000		85	40-140		
Benzo[b] fluoranthene	55.0		ug/sample	60.000		92	40-140		
Benzo[g,h,i] perylene	50.2		ug/sample	60.000		84	40-140		
Benzo[k] fluoranthene	54.6		ug/sample	60.000		91	40-140		
Bis(2-chloroethoxy) methane	53.3		ug/sample	60.000		89	30-115		

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C									
LCS (L211239-BS1)			Prepared: 11/28/2012 Analyzed: 12/10/2012						
Bis(2-chloroethyl) ether	49.7		ug/sample	60.000		83	35-110		
Bis(2-chloroisopropyl) ether	47.2		ug/sample	60.000		79	30-125		
Bis(2-ethylhexyl) phthalate	46.2		ug/sample	60.000		77	40-150		
Butyl Benzyl Phthalate	44.9		ug/sample	60.000		75	40-140		
Carbazole	39.6		ug/sample	60.000		66	20-120		
Chrysene	52.5		ug/sample	60.000		87	45-130		
Dibenz[a,h]anthracene	52.7		ug/sample	60.000		88	35-150		
Dibenzofuran	55.7		ug/sample	60.000		93	50-115		
Diethyl Phthalate	53.9		ug/sample	60.000		90	40-130		
Dimethyl Phthalate	53.8		ug/sample	60.000		90	40-130		
Di-n-butyl Phthalate	48.5		ug/sample	60.000		81	40-130		
Di-n-octyl Phthalate	50.9		ug/sample	60.000		85	35-155		
Fluoranthene	52.6		ug/sample	60.000		88	45-130		
Fluorene	54.4		ug/sample	60.000		91	50-120		
Hexachlorobenzene	67.3		ug/sample	60.000		112*	50-110		
Hexachlorobutadiene	69.3		ug/sample	60.000		116*	30-100		
Hexachlorocyclopentadiene	41.4		ug/sample	60.000		69	10-100		
Hexachloroethane	48.8		ug/sample	60.000		81	25-100		
Indeno[1,2,3-cd]pyrene	50.9		ug/sample	60.000		85	50-140		
Isophorone	51.5		ug/sample	60.000		86	40-110		
Naphthalene	59.0		ug/sample	60.000		98	35-100		
Nitrobenzene	51.0		ug/sample	60.000		85	40-110		
N-Nitrosodi-n-propylamine	49.7		ug/sample	60.000		83	30-120		
N-Nitrosodiphenylamine	49.0		ug/sample	60.000		82	25-110		
Pentachlorophenol	74.1		ug/sample	60.000		123	20-130		
Phenanthrene	53.4		ug/sample	60.000		89	50-120		
Phenol	49.0		ug/sample	60.000		82	30-110		
Pyrene	47.3		ug/sample	60.000		79	50-130		
Surrogate: 2-Fluorophenol	*56.5*		*ug/sample*	*75.000*		*75*	*21-100*		
Surrogate: Phenol-d5	*60.1*		*ug/sample*	*75.000*		*80*	*10-94*		
Surrogate: Nitrobenzene-d5	*44.6*		*ug/sample*	*50.000*		*89*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*44.8*		*ug/sample*	*50.000*		*90*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*89.3*		*ug/sample*	*75.000*		*119*	*10-123*		
Surrogate: p-Terphenyl-d14	*37.9*		*ug/sample*	*50.000*		*76*	*33-141*		

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C									
LCS Dup (L211239-BSD1)			Prepared: 11/28/2012 Analyzed: 12/10/2012						
1,2,4-Trichlorobenzene	52.5		ug/sample	60.000		88	35-105	8	20
1,2-Dichlorobenzene	51.9		ug/sample	60.000		86	35-100	2	20
1,3-Dichlorobenzene	49.6		ug/sample	60.000		83	30-100	2	20
1,4-Dichlorobenzene	49.6		ug/sample	60.000		83	30-100	0.4	20
2,4,5-Trichlorophenol	57.2		ug/sample	60.000		95	45-125	12	20
2,4,6-Trichlorophenol	53.3		ug/sample	60.000		89	40-125	10	20
2,4-Dichlorophenol	53.7		ug/sample	60.000		89	40-120	12	20
2,4-Dimethylphenol	18.9		ug/sample	60.000		32	30-110	74*	20
2,4-Dinitrophenol	59.6		ug/sample	60.000		99	15-140	9	20
2,4-Dinitrotoluene	51.9		ug/sample	60.000		86	50-120	5	20
2,6-Dinitrotoluene	50.8		ug/sample	60.000		85	50-115	6	20
2-Chloronaphthalene	49.6		ug/sample	60.000		83	40-110	5	20
2-Chlorophenol	52.0		ug/sample	60.000		87	35-115	1	20
2-Methylnaphthalene	49.8		ug/sample	60.000		83	35-105	13	20
2-Methylphenol	46.4		ug/sample	60.000		77	40-110	12	20
2-Nitroaniline	51.1		ug/sample	60.000		85	35-110	8	20
2-Nitrophenol	51.4		ug/sample	60.000		86	30-115	9	20
3,3'-Dichlorobenzidine	45.4		ug/sample	60.000		76	20-150	1	20
3-Nitroaniline	49.3		ug/sample	60.000		82	5-120	2	20
4,6-Dinitro-2-methylphenol	64.8		ug/sample	60.000		108	40-130	8	20
4-Bromophenyl Phenyl Ether	53.1		ug/sample	60.000		88	50-110	19	20
4-Chloro-3-methylphenol	50.1		ug/sample	60.000		84	40-110	16	20
4-Chloroaniline	45.9		ug/sample	60.000		76	10-120	14	20
4-Chlorophenyl Phenyl Ether	52.4		ug/sample	60.000		87	40-120	10	20
3- and/or 4-Methylphenol	45.8		ug/sample	60.000		76	30-110	10	20
4-Nitroaniline	35.0		ug/sample	60.000		58	5-110	6	20
4-Nitrophenol	57.5		ug/sample	60.000		96	5-150	3	20
Acenaphthene	48.3		ug/sample	60.000		80	35-110	9	20
Acenaphthylene	46.8		ug/sample	60.000		78	30-110	3	20
Anthracene	47.6		ug/sample	60.000		79	40-120	6	20
Benz[a]anthracene	49.4		ug/sample	60.000		82	40-120	2	20
Benzo[a] pyrene	48.5		ug/sample	60.000		81	40-140	5	20
Benzo[b] fluoranthene	49.9		ug/sample	60.000		83	40-140	10	20
Benzo[g,h,i] perylene	48.9		ug/sample	60.000		81	40-140	3	20
Benzo[k] fluoranthene	51.9		ug/sample	60.000		86	40-140	5	20
Bis(2-chloroethoxy) methane	49.4		ug/sample	60.000		82	30-115	8	20

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

WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/11/2012 13:21

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 L211239 - SW 3540C									
LCS Dup (L211239-BSD1)			Prepared: 11/28/2012 Analyzed: 12/10/2012						
Bis(2-chloroethyl) ether	47.6		ug/sample	60.000		79	35-110	4	20
Bis(2-chloroisopropyl) ether	46.3		ug/sample	60.000		77	30-125	2	20
Bis(2-ethylhexyl) phthalate	45.3		ug/sample	60.000		75	40-150	2	20
Butyl Benzyl Phthalate	42.9		ug/sample	60.000		72	40-140	5	20
Carbazole	37.0		ug/sample	60.000		62	20-120	7	20
Chrysene	50.8		ug/sample	60.000		85	45-130	3	20
Dibenz[a,h]anthracene	52.5		ug/sample	60.000		87	35-150	0.3	20
Dibenzofuran	51.5		ug/sample	60.000		86	50-115	8	20
Diethyl Phthalate	50.0		ug/sample	60.000		83	40-130	8	20
Dimethyl Phthalate	49.0		ug/sample	60.000		82	40-130	9	20
Di-n-butyl Phthalate	47.3		ug/sample	60.000		79	40-130	3	20
Di-n-octyl Phthalate	47.3		ug/sample	60.000		79	35-155	7	20
Fluoranthene	53.1		ug/sample	60.000		88	45-130	0.9	20
Fluorene	49.4		ug/sample	60.000		82	50-120	10	20
Hexachlorobenzene	58.1		ug/sample	60.000		97	50-110	15	20
Hexachlorobutadiene	65.3		ug/sample	60.000		109*	30-100	6	20
Hexachlorocyclopentadiene	36.2		ug/sample	60.000		60	10-100	14	20
Hexachloroethane	49.6		ug/sample	60.000		83	25-100	2	20
Indeno[1,2,3-cd]pyrene	50.0		ug/sample	60.000		83	50-140	2	20
Isophorone	46.0		ug/sample	60.000		77	40-110	11	20
Naphthalene	56.3		ug/sample	60.000		94	35-100	5	20
Nitrobenzene	48.5		ug/sample	60.000		81	40-110	5	20
N-Nitrosodi-n-propylamine	45.3		ug/sample	60.000		75	30-120	9	20
N-Nitrosodiphenylamine	41.8		ug/sample	60.000		70	25-110	16	20
Pentachlorophenol	67.8		ug/sample	60.000		113	20-130	9	20
Phenanthrene	49.7		ug/sample	60.000		83	50-120	7	20
Phenol	48.1		ug/sample	60.000		80	30-110	2	20
Pyrene	44.0		ug/sample	60.000		73	50-130	7	20
Surrogate: 2-Fluorophenol	*55.0*		*ug/sample*	*75.000*		*73*	*21-100*		
Surrogate: Phenol-d5	*59.2*		*ug/sample*	*75.000*		*79*	*10-94*		
Surrogate: Nitrobenzene-d5	*41.1*		*ug/sample*	*50.000*		*82*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*41.6*		*ug/sample*	*50.000*		*83*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*72.0*		*ug/sample*	*75.000*		*96*	*10-123*		
Surrogate: p-Terphenyl-d14	*33.7*		*ug/sample*	*50.000*		*67*	*33-141*		

PREPARATION BENCH SHEET

L211239

Lionville Laboratory

Printed: 12/10/2012 2:31:36PM

000000024

Matrix: Wipe

Prepared using: Extraction - SW 3540C

Surrogate used: 1201164

Lab Number	Analysis	Prepared	Initial (Wipe)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211096-01	8270C TCL SVOC	11/28/2012 15:20	1	1				500	WC-Hanford, Inc.	RADH
L211239-BLK1	QC	11/28/2012 15:20	1	1				500		
L211239-BS1	QC	11/28/2012 15:20	1	1	1201082		600	500		
L211239-BSD1	QC	11/28/2012 15:20	1	1	1201082		600	500		

Extracts Relinquished By — Date: 12/10/12 1525

Extracts Received By — Date: 12/10/12 1510

PAHs

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-150 Project Number: K4032 Project Manager: Joan Kessner	**Reported:** 12/15/2012 20:36

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5L3	1211096-01	Other Solid	11/14/2012 11:25	11/20/2012 15:50

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-150 K4032
LVL #: 1211096

W.O. #: 60049-001-001-0001-00
Date Received: 11-20-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) wipe sample was collected on 11-14-2012.

The sample and associated QC samples were extracted 11-28-2012 and analyzed 12-01-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.

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

3. All obtainable surrogate recoveries were within QC acceptance criteria.

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

5. All blank spike recoveries were within QC acceptance criteria.

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

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

8. 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

12/21/12
Date

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

LIONVILLE LABORATORY INC.

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/15/2012 20:36

J1R5L3

1211096-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Acenaphthylene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Acenaphthene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Fluorene	**0.195**		0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Phenanthrene	**0.0550**	J	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Anthracene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Fluoranthene	**0.135**		0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Indeno[1,2,3-cd]pyrene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Pyrene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Benz[a]anthracene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Chrysene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Benzo[b] fluoranthene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Benzo[k] fluoranthene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Benzo[a] pyrene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Dibenz[a,h]anthracene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Benzo[g,h,i] perylene	0.100	U	0.100	ug/sample	1	L211238	11/28/2012	12/01/2012	8310
Surrogate: Triphenylene	*88 %*		*68-129*			*L211238*	*11/28/2012*	*12/01/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/15/2012 20:36

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 L211238 - SW 3540C										
Blank (L211238-BLK1)				Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	0.100	U	0.100	ug/sample						
Acenaphthylene	0.100	U	0.100	ug/sample						
Acenaphthene	0.100	U	0.100	ug/sample						
Fluorene	0.100	U	0.100	ug/sample						
Phenanthrene	0.100	U	0.100	ug/sample						
Anthracene	0.100	U	0.100	ug/sample						
Fluoranthene	0.100	U	0.100	ug/sample						
Indeno[1,2,3-cd]pyrene	0.100	U	0.100	ug/sample						
Pyrene	0.100	U	0.100	ug/sample						
Benz[a]anthracene	0.100	U	0.100	ug/sample						
Chrysene	0.100	U	0.100	ug/sample						
Benzo[b] fluoranthene	0.100	U	0.100	ug/sample						
Benzo[k] fluoranthene	0.100	U	0.100	ug/sample						
Benzo[a] pyrene	0.100	U	0.100	ug/sample						
Dibenz[a,h]anthracene	0.100	U	0.100	ug/sample						
Benzo[g,h,i] perylene	0.100	U	0.100	ug/sample						
Surrogate: Triphenylene	*4.64*			*ug/sample*	*5.0000*		*93*	*68-129*		
LCS (L211238-BS1)				Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	3.69		0.100	ug/sample	5.0000		74	0-127		
Acenaphthylene	4.06		0.100	ug/sample	5.0000		81	50-140		
Acenaphthene	4.11		0.100	ug/sample	5.0000		82	17-139		
Fluorene	4.30		0.100	ug/sample	5.0000		86	28-145		
Phenanthrene	4.15		0.100	ug/sample	5.0000		83	30-152		
Anthracene	4.20		0.100	ug/sample	5.0000		84	19-171		
Fluoranthene	4.22		0.100	ug/sample	5.0000		84	34-159		
Indeno[1,2,3-cd]pyrene	4.35		0.100	ug/sample	5.0000		87	31-156		
Pyrene	4.07		0.100	ug/sample	5.0000		81	33-152		
Benz[a]anthracene	4.41		0.100	ug/sample	5.0000		88	32-157		
Chrysene	4.11		0.100	ug/sample	5.0000		82	31-159		
Benzo[b] fluoranthene	4.44		0.100	ug/sample	5.0000		89	33-164		
Benzo[k] fluoranthene	4.44		0.100	ug/sample	5.0000		89	28-161		
Benzo[a] pyrene	4.31		0.100	ug/sample	5.0000		86	29-149		
Dibenz[a,h]anthracene	4.47		0.100	ug/sample	5.0000		89	27-153		
Benzo[g,h,i] perylene	4.55		0.100	ug/sample	5.0000		91	32-157		
Surrogate: Triphenylene	*4.23*			*ug/sample*	*5.0000*		*85*	*68-129*		

LIONVILLE LABORATORY
A division of Eastern Analytical Corporation

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/15/2012 20:36

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 L211238 - SW 3540C									
LCS Dup (L211238-BSD1)			Prepared: 11/28/2012 Analyzed: 12/01/2012						
Naphthalene	3.92	0.100	ug/sample	5.0000		78	0-127	6	30
Acenaphthylene	4.18	0.100	ug/sample	5.0000		84	50-140	3	30
Acenaphthene	4.37	0.100	ug/sample	5.0000		87	17-139	6	30
Fluorene	4.50	0.100	ug/sample	5.0000		90	28-145	4	30
Phenanthrene	4.37	0.100	ug/sample	5.0000		87	30-152	5	30
Anthracene	4.38	0.100	ug/sample	5.0000		88	19-171	4	30
Fluoranthene	4.60	0.100	ug/sample	5.0000		92	34-159	9	30
Indeno[1,2,3-cd]pyrene	4.77	0.100	ug/sample	5.0000		95	31-156	9	30
Pyrene	4.32	0.100	ug/sample	5.0000		86	33-152	6	30
Benz[a]anthracene	4.77	0.100	ug/sample	5.0000		95	32-157	8	30
Chrysene	4.44	0.100	ug/sample	5.0000		89	31-159	8	30
Benzo[b] fluoranthene	4.79	0.100	ug/sample	5.0000		96	33-164	8	30
Benzo[k] fluoranthene	4.76	0.100	ug/sample	5.0000		95	28-161	7	30
Benzo[a] pyrene	4.59	0.100	ug/sample	5.0000		92	29-149	6	30
Dibenz[a,h]anthracene	4.85	0.100	ug/sample	5.0000		97	27-153	8	30
Benzo[g,h,i] perylene	4.88	0.100	ug/sample	5.0000		98	32-157	7	30
Surrogate: Triphenylene	*4.87*		*ug/sample*	*5.0000*		*97*	*68-129*		

PREPARATION BENCH SHEET

L211238

Lionville Laboratory

Printed: 12/4/2012 9:04:00PM

Matrix: Wipe **Prepared using: HPLC - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (Wipe)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211096-01	8310 PAH	11/28/2012 15:01	1	5				50	WC-Hanford, Inc.	
L211238-BLK1	QC	11/28/2012 15:01	1	5				50		
L211238-BS1	QC	11/28/2012 15:01	1	5	1200963		50	50		
L211238-BSD1	QC	11/28/2012 15:01	1	5	1200963		50	50		

REVISION

CAC 12/04/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L211238

Lionville Laboratory

Printed: 11/29/2012 2:54:44PM

Matrix: Wipe **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1200612**

Lab Number	Analysis	Prepared	Initial (Wipe)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211096-01	8310 PAH	11/28/2012 15:01	1	5				50	WC-Hanford, Inc.	
L211238-BLK1	QC	11/28/2012 15:01	1	5				50		
L211238-BS1	QC	11/28/2012 15:01	1	5	1200963		50	50		
L211238-BSD1	QC	11/28/2012 15:01	1	5	1200963		50	50		

Extracts Relinquished By — Date: 11/29/12 1525

Extracts Received By: LC — Date: 11/30/12

METALS

LIONVILLE LABORATORY
A division of Pipeline Analytical Corporation

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R5L3	1211096-01	Other Solid	11/14/2012 11:25	11/20/2012 15:50

LIONVILLE LABORATORY
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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-150
LVL#: 1211096
SDG/SAF#: K4032/RC-150

W.O.#: 60049-001-001-0001-00
Date Received: 11-20-12

METALS

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

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

1. This narrative covers the analysis of 1 other solid (wipe) sample.

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

   Each sample was divided into two, approximately equal, parts. One part was digested for ICP metals analyses and the other part was digested for Mercury analysis. A duplicate and a matrix spike were performed for each analysis. The initial weight for each digestate was a sixth of the original wipe.

   The sample was analyzed and reported with a 25,000-fold dilution for Mercury due to the high concentration of Mercury in the sample.

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

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

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

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

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

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 laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon (28.9%).

10. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits.

11. For analytes where the MS is out of control, a post-digestion MS (PDS) is performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration levels for the following analytes: Aluminum, Chromium, Iron, Silver, Mercury, and Silicon.

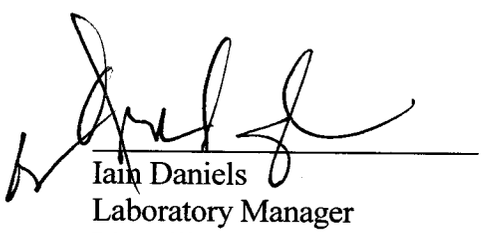
Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1R5L3	Mercury	1.0	110

12. The duplicate analyses for 8 analytes were outside 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 Copper, Molybdenum, Nickel, and Vanadium 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

12/21/12
Date

alm/11-096

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

WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

J1R5L3
1211096-01 (Other Solid)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**264**		120	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Antimony	6.00	U	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Arsenic	6.00	U	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Barium	**64.2**		3.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Beryllium	1.20	U	1.20	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Boron	**3.95**	B	12.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Cadmium	1.50	U	1.50	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Calcium	**417**		120	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Chromium	**104**		6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Cobalt	18.0	U	18.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Copper	**24.5**		12.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Iron	**1650**		120	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Lead	**183**		6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Lithium	12.0	U	12.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Magnesium	**264**		30.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Manganese	**89.4**		6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Molybdenum	**1.81**	B	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Nickel	**28.0**		15.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Potassium	**291**	B	600	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Selenium	6.00	U	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Silicon	**262**		36.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Silver	**22.8**		6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Sodium	**433**		300	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Thallium	6.00	U	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Uranium	60.0	U	60.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Vanadium	**1.33**	B	6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Zinc	**180**		18.0	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Zirconium	**13.1**		6.00	ug/sample	1	L212007	12/04/2012	12/05/2012	6010B
Mercury	**18400**		1500	ug/sample	25000	L212008	12/04/2012	12/10/2012	7471A

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-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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 L212007 - SW 3050B										
Blank (L212007-BLK1)				Prepared: 12/04/2012 Analyzed: 12/05/2012						
Aluminum	20.0	U	20.0	ug/sample						
Antimony	1.00	U	1.00	ug/sample						
Arsenic	1.00	U	1.00	ug/sample						
Barium	0.500	U	0.500	ug/sample						
Beryllium	0.200	U	0.200	ug/sample						
Boron	2.00	U	2.00	ug/sample						
Cadmium	0.250	U	0.250	ug/sample						
Calcium	20.0	U	20.0	ug/sample						
Chromium	1.00	U	1.00	ug/sample						
Cobalt	3.00	U	3.00	ug/sample						
Copper	2.00	U	2.00	ug/sample						
Iron	20.0	U	20.0	ug/sample						
Lead	1.00	U	1.00	ug/sample						
Lithium	2.00	U	2.00	ug/sample						
Magnesium	5.00	U	5.00	ug/sample						
Manganese	1.00	U	1.00	ug/sample						
Molybdenum	1.00	U	1.00	ug/sample						
Nickel	2.50	U	2.50	ug/sample						
Potassium	100	U	100	ug/sample						
Selenium	1.00	U	1.00	ug/sample						
Silicon	6.00	U	6.00	ug/sample						
Silver	1.00	U	1.00	ug/sample						
Sodium	50.0	U	50.0	ug/sample						
Thallium	1.00	U	1.00	ug/sample						
Uranium	10.0	U	10.0	ug/sample						
Vanadium	1.00	U	1.00	ug/sample						
Zinc	3.00	U	3.00	ug/sample						
Zirconium	1.00	U	1.00	ug/sample						

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2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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 L212007 - SW 3050B									
LCS (L212007-BS1)			Prepared: 12/04/2012 Analyzed: 12/05/2012						
Aluminum	242	20.0	ug/sample	250.00		97	80-120		
Antimony	149	1.00	ug/sample	150.00		99	80-120		
Arsenic	484	1.00	ug/sample	500.00		97	80-120		
Barium	252	0.500	ug/sample	250.00		101	80-120		
Beryllium	12.3	0.200	ug/sample	12.500		98	80-120		
Boron	238	2.00	ug/sample	250.00		95	80-120		
Cadmium	10.9	0.250	ug/sample	12.500		87	80-120		
Calcium	1250	20.0	ug/sample	1250.0		100	80-120		
Chromium	25.3	1.00	ug/sample	25.000		101	80-120		
Cobalt	124	3.00	ug/sample	125.00		100	80-120		
Copper	61.8	2.00	ug/sample	62.500		99	80-120		
Iron	252	20.0	ug/sample	250.00		101	80-120		
Lead	121	1.00	ug/sample	125.00		97	80-120		
Lithium	255	2.00	ug/sample	250.00		102	80-120		
Magnesium	1240	5.00	ug/sample	1250.0		99	80-120		
Manganese	37.5	1.00	ug/sample	37.500		100	80-120		
Molybdenum	258	1.00	ug/sample	250.00		103	80-120		
Nickel	99.1	2.50	ug/sample	100.00		99	80-120		
Potassium	1230	100	ug/sample	1250.0		99	80-120		
Selenium	470	1.00	ug/sample	500.00		94	80-120		
Silicon	72.4	6.00	ug/sample	250.00		29*	80-120		
Silver	24.6	1.00	ug/sample	25.000		98	80-120		
Sodium	1230	50.0	ug/sample	1250.0		98	80-120		
Thallium	483	1.00	ug/sample	500.00		97	80-120		
Uranium	243	10.0	ug/sample	250.00		97	80-120		
Vanadium	126	1.00	ug/sample	125.00		101	80-120		
Zinc	50.0	3.00	ug/sample	50.000		100	80-120		
Zirconium	254	1.00	ug/sample	250.00		102	80-120		

LVL
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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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 L212007 - SW 3050B										
Duplicate (L212007-DUP2)	**Source: 1211096-01**		Prepared: 12/04/2012 Analyzed: 12/05/2012							
Aluminum	426		120	ug/sample		264			47*	20
Antimony	6.00	U	6.00	ug/sample		6.00 U				20
Arsenic	6.00	U	6.00	ug/sample		6.00 U				20
Barium	81.0		3.00	ug/sample		64.2			23*	20
Beryllium	1.20	U	1.20	ug/sample		1.20 U				20
Boron	4.70	B	12.0	ug/sample		3.95			17	20
Cadmium	1.50	U	1.50	ug/sample		1.50 U				20
Calcium	540		120	ug/sample		417			26*	20
Chromium	152		6.00	ug/sample		104			38*	20
Cobalt	18.0	U	18.0	ug/sample		18.0 U				20
Copper	15.3		12.0	ug/sample		24.5			46*	20
Iron	2510		120	ug/sample		1650			41*	20
Lead	157		6.00	ug/sample		183			15	20
Lithium	12.0	U	12.0	ug/sample		12.0 U				20
Magnesium	336		30.0	ug/sample		264			24*	20
Manganese	123		6.00	ug/sample		89.4			32*	20
Molybdenum	3.13	B	6.00	ug/sample		1.81			53*	20
Nickel	45.7		15.0	ug/sample		28.0			48*	20
Potassium	329	B	600	ug/sample		291			12	20
Selenium	6.00	U	6.00	ug/sample		6.00 U				20
Silicon	303		36.0	ug/sample		262			14	20
Silver	33.7		6.00	ug/sample		22.8			39*	20
Sodium	454		300	ug/sample		433			5	20
Thallium	6.00	U	6.00	ug/sample		6.00 U				20
Uranium	17.9	B	60.0	ug/sample		60.0 U				20
Vanadium	2.08	B	6.00	ug/sample		1.33			44*	20
Zinc	203		18.0	ug/sample		180			12	20
Zirconium	7.74		6.00	ug/sample		13.1			51*	20

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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 L212007 - SW 3050B									
Matrix Spike (L212007-MS2)	**Source: 1211096-01**		Prepared: 12/04/2012 Analyzed: 12/05/2012						
Aluminum	1240	120	ug/sample	600.00	264	163*	75-125		
Antimony	147	6.00	ug/sample	150.00	6.00 U	98	75-125		
Arsenic	573	6.00	ug/sample	600.00	6.00 U	95	75-125		
Barium	658	3.00	ug/sample	600.00	64.2	99	75-125		
Beryllium	14.5	1.20	ug/sample	15.000	1.20 U	96	75-125		
Boron	289	12.0	ug/sample	300.00	3.95	95	75-125		
Cadmium	12.9	1.50	ug/sample	15.000	1.50 U	86	75-125		
Calcium	7980	120	ug/sample	7500.0	417	101	75-125		
Chromium	201	6.00	ug/sample	60.000	104	162*	75-125		
Cobalt	146	18.0	ug/sample	150.00	18.0 U	98	75-125		
Copper	84.1	12.0	ug/sample	75.000	24.5	79	75-125		
Iron	2770	120	ug/sample	300.00	1650	373*	75-125		
Lead	340	6.00	ug/sample	150.00	183	104	75-125		
Lithium	298	12.0	ug/sample	300.00	12.0 U	99	75-125		
Magnesium	7640	30.0	ug/sample	7500.0	264	98	75-125		
Manganese	248	6.00	ug/sample	150.00	89.4	106	75-125		
Molybdenum	305	6.00	ug/sample	300.00	1.81	101	75-125		
Nickel	192	15.0	ug/sample	150.00	28.0	109	75-125		
Potassium	7620	600	ug/sample	7500.0	291	98	75-125		
Selenium	576	6.00	ug/sample	600.00	6.00 U	96	75-125		
Silicon	1370	36.0	ug/sample	300.00	262	370*	75-125		
Silver	46.9	6.00	ug/sample	15.000	22.8	160*	75-125		
Sodium	7750	300	ug/sample	7500.0	433	98	75-125		
Thallium	573	6.00	ug/sample	600.00	6.00 U	96	75-125		
Uranium	1450	60.0	ug/sample	1500.0	60.0 U	97	75-125		
Vanadium	146	6.00	ug/sample	150.00	1.33	96	75-125		
Zinc	334	18.0	ug/sample	150.00	180	102	75-125		
Zirconium	1460	6.00	ug/sample	1500.0	13.1	96	75-125		

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WC-Hanford, Inc.	Project: RC-150	
2620 Fermi Avenue	Project Number: K4032	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	12/12/2012 11:15

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 L212007 - SW 3050B										
Post Spike (L212007-PS2)		**Source: 1211096-01**		Prepared: 12/04/2012 Analyzed: 12/05/2012						
Aluminum	3000			ug/L	2000.0	879	106	75-125		
Chromium	456			ug/L	100.00	347	110	75-125		
Iron	7660			ug/L	2000.0	5510	107	75-125		
Silicon	2110			ug/L	1100.0	875	112	75-125		
Silver	180			ug/L	100.00	76.1	104	75-125		
Batch L212008 - SW 7471A Prep										
Blank (L212008-BLK1)				Prepared: 12/04/2012 Analyzed: 12/10/2012						
Mercury	0.0100	U	0.0100	ug/sample						
LCS (L212008-BS1)				Prepared: 12/04/2012 Analyzed: 12/10/2012						
Mercury	0.256		0.0100	ug/sample	0.25000		103	80-120		
Duplicate (L212008-DUP2)		**Source: 1211096-01**		Prepared: 12/04/2012 Analyzed: 12/10/2012						
Mercury	19300		1500	ug/sample		18400			4.37	20
Matrix Spike (L212008-MS2)		**Source: 1211096-01**		Prepared: 12/04/2012 Analyzed: 12/10/2012						
Mercury	21200		1500	ug/sample	0.30000	18400	925000*	75-125		

Lionville Laboratory Sample aliquots created evening of 12/3/12 Logbook #: 1194

SAMPLE DIGESTION RECORD

Digestion Batch #: L212007
Date/Time Initiated: 12/4/12 1150
Date/Time Completed: 12/4/12 1920
Analyst: MW
Matrix (circle): Soil Water Other wipe
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: 97°
BLOCK 1 2 (3) (circle one)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1211045-01		1/6 wipe	50		TO		wipe with dark grey-brown particulate and attached lint	RAD III	
L212007-DUP1		1/6 wipe	50						
MS1	0.5 *	1/6 wipe	50						
1211096-01		1/6 wipe	50				wipe with brown stains	RAD II	
L212007-DUP2		1/6 wipe	50						
MS2	0.5 *	1/6 wipe	50						
BLK1		N/A	50				reagent blank		
BS1	0.5 *	N/A	50				reagent blank - spike		

MW 12/4/12

Spiking IDs / Expiration Date:
MS# : 1201581
LCS#: 1201583

Reagent IDs:
HNO_3 0000003390
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-076-07
1:1 HCl

File ID#:

Data Review By/Date:
Qlm 12/5/12

* also 0.25 mL each of: 1200380 (U-) and 1200386 (Zr)

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

~~120~~ 1211045 - each aliquot (1/6 wipe) weighs ~ 0.5 gm
1211096 - each aliquot (1/6 wipe) weighs ~ 0.7 gm

Page #: 1

Each wipe divided into 6 approximately equal portions, 3 each for ICP + Hg with QC.

PREPARATION BENCH SHEET

L212007

Lionville Laboratory

Printed: 12/11/2012 10:37:25AM

Matrix: Wipe

Prepared using: METALS - SW 3050B

(No Surrogate)

Lab Number	Analysis	Prepared	Initial (Wipe)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211045-01	6010B HSL Metals	12/04/2012 11:50	0.1666667	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
1211096-01	6010B HSL Metals	12/04/2012 11:50	0.1666667	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
L212007-BLK1	QC	12/04/2012 11:50	1	50						no blank wipe used, reagent blank/blank spike only
L212007-BS1	QC	12/04/2012 11:50	1	50	1201583		500			no blank wipe used, reagent blank/blank spike only
L212007-DUP1	QC	12/04/2012 11:50	0.1666667	50		1211045-01				
L212007-DUP2	QC	12/04/2012 11:50	0.1666667	50		1211096-01				
L212007-MS1	QC	12/04/2012 11:50	0.1666667	50	1201581	1211045-01	500			
L212007-MS2	QC	12/04/2012 11:50	0.1666667	50	1201581	1211096-01	500			
L212007-PS1	QC	12/04/2012 11:50	0.1666667	50	1201582	1211045-01	100			
L212007-PS2	QC	12/04/2012 11:50	0.1666667	50	1001902	1211096-01	100			changed PDS spike due to conflict with 1211045 alm 12/11/2012

Revision changed spike ID for L212007-PS2 due to conflict. alm 12/11/12

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L212007

Lionville Laboratory

Printed: 12/4/2012 8:42:13PM

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

Lab Number	Analysis	Prepared	Initial (Wipe)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1211045-01	6010B HSL Metals	12/04/2012 11:50	0.1666667	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
1211096-01	6010B HSL Metals	12/04/2012 11:50	0.1666667	50					WC-Hanford, Inc.	HSL + B, Li, Mo, Si, U, Zr (No TL)
L212007-BLK1	QC	12/04/2012 11:50	1	50						no blank wipe used, reagent blank/blank spike only
L212007-BS1	QC	12/04/2012 11:50	1	50	1201583		500			no blank wipe used, reagent blank/blank spike only
L212007-DUP1	QC	12/04/2012 11:50	0.1666667	50		1211045-01				
L212007-DUP2	QC	12/04/2012 11:50	0.1666667	50		1211096-01				
L212007-MS1	QC	12/04/2012 11:50	0.1666667	50	1201581	1211045-01	500			
L212007-MS2	QC	12/04/2012 11:50	0.1666667	50	1201581	1211096-01	500			
L212007-PS1	QC	12/04/2012 11:50	0.1666667	50	1201582	1211045-01	100			
L212007-PS2	QC	12/04/2012 11:50	0.1666667	50	1201582	1211096-01	100			

Extracts Relinquished By — Date: 12/4/12

Extracts Received By — Date: 12/05/12

Lionville Laboratory

MERCURY PREPARATION

Analyst: [signature]
Date 12/4/12
Start Time/Temp: 1938/94°
End Time/Temp: 2111/98°

Instrument ID: HG3.1/HG3.1/HG3.2
Balance # ~~N/A~~
Pipette Calibration (Daily) (Y)

Logbook # 1153
Prep Batch: L212008
Worksheet: HG120501/HG121001
SOP No. ME-HgCVAA HG121002
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH <2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
blank				10 mL	50	
0.2 µg/L		0.100		10 mL	50	
1.0 µg/L		0.500		10 mL	50	
2.0 µg/L		1.000		10 mL	50	
5.0 µg/L		2.500		10 mL	50	
10.0 µg/L		5.000		10 mL	50	
ICV		0.125	2.5	10 mL	50	
CCV		0.250	5.0	10 mL	50	
ICB/CCB				10 mL	50	
L212008-BLK1				10 mL	50	
BS1		0.250	5.0	10 mL	50	
1211045-01				1/6 wipe	50	wipes were cut into
L212008-DUP1				1/6 wipe	50	small pieces and each
MS1		0.500	1.0	1/6 wipe	50	divided into 6 piles,
1211096-01				1/6 wipe	50	3 for ICP+QC, 3 for Hg
L212008-DUP2				1/6 wipe	50	and QC, for each wipe
MS2		0.500	1.0	1/6 wipe	50	JW 12/4/12

JW 12/4/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201235	12/4/12 1400
ICV/CCV/LCS	(I.V. 1201411)	N/A

Reviewed By/Date: [signature] 12/6/12

Soil LCS True Value = N/A mg/Kg
Standard # _____

see book # 1153 for std traceability information

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