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 11/26/12
INITIAL/DATE

COMMENTS:

SDG K3999 SAF-RC-148

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Sample Location/Waste Site: 308 Ramp Composite #1

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

11 November 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 #	1210029
SDG #	K3999
SAF #	RC-148
Date Received	10/10/12
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	X
Pest/PCB	X
Glycols	X
DRO/KRO/GRO	X
PAHs	X
Herbicides	X
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 108 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

12/0029

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: SH TAT: 21

Date Rec'd: 10/10/12 Date Due: 10/31/12

	A	B	C	D	E	F	G	H	I	J	K	L
Refrigerator #	1	1	1	1	1	1	1	1	1	1	1	1
#/Type Container (Solid)	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG
Volume (Solid)	60	60	60	60	60	60	60	60	60	60	60	250
Preservatives	–	–	–	–	–	–	–	–	–	–	–	–
ANALYSES REQUESTED (ORGANIC)	VOA	BNA	~~Pesticide~~ PCB	CHLORO Herb	PAH's	Pest	WP HD	INORG: Metal Hg	INORG: CN	Sulfide	PH	Cr6
Lionville Laboratory Use Only	TCL+TBP 8270	8082	8151	8310	8081	DRO/MRO	METALS	CYANIDE	SULFIDE	PH	Cr6+	TC ions NH3 NO2 NO3

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	TCL+TBP 8270	8082	8151	8310	8081	DRO/MRO	METALS	CYANIDE	SULFIDE	PH	Cr6+	TC ions NH3 NO2 NO3	NONHALO Ethylene Glycol	TRIBUTYL PHOSPHATE
	01	J1R2T9	✓	✓	SOIL	10-9-12	0952	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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

Special Instructions: MATRIX QC

METALS = HSL+B, Li, Mo, Si, U, Zr (NOTL)
NonHaloVOA = Ethylene Glycol only
8270 BNA = TCL + TBP

Special Instructions:
10/10/12 1. TBP will be reported from BNA run osj
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
[signature]	[signature]	9/10/12	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

TRE 10-9-12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page 1 of ~~3~~ 2

Collector M. Simonds	Company Contact Tom Edmundson	Telephone No. TRE 10-9-12 509-~~967-5673~~ 947-5192	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 308 Ramp Composite #1		SAF No. RC-148
Ice Chest No. WCH-12-023	Field Logbook No. EL-1518-26	COA R308A0J453	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A110539		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive <DOT Limits

Special Handling and/or Storage

Cool 4C

SAMPLE ANALYSIS												
Preservation	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	AJ 1 10-9-12	1	1	1 AJ 10-9-12	1	1
Volume	60mL	60mL	60mL	60mL	~~60mL~~ ~~120mL~~ ~~60mL~~	250mL	~~120mL~~ 60ml	~~250mL~~ ~~60ml~~ ~~120mL~~	~~120mL~~ 60 ml	~~120mL~~ 60 ml
	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	SMS 10/9/12 Total Cyanide - 9010; Sulfides - 9030	~~TOC - 9060~~ TRE 10-9-12 GC-8015M (Ethylene glycol Tributyl phosphate)	TPH-Diesel Range - WTPH-D +	Semi-VOA - 8270A (TCL) SMS 10/9/12	PCBs - 8082	PAHs - 8310

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2T9	SOIL	10-9-12	0952	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

RCF 3440

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LVI Miranda Simonds	10/9/12 1105	WCH SM Sexton	10/9/12 1105
SM Sexton	10/9/12 1130	A. Freier	10-9-12 1130
Fed Ex		10-9-12 MMB	
WCH A. Freier	10-9-12 1205	Fed Ex	
	10-10-12 0945	Victor Hernandez	10-10-12 0945

SPECIAL INSTRUCTIONS

(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)

REVIEWED BY MMB DATE 10-9-12

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

00000004

TRE 10-9-12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page 2 of 22

Collector M. Simonds	Company Contact Tom Edmundson	Telephone No. TRE 10-9-12 509-~~967-5673~~-947-5192	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 308 Ramp Composite #1		SAF No. RC-148
Ice Chest No. WCH -12- 023	Field Logbook No. EL-1518-26	COA R308A0J453	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A 110539		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive <DOT Limits

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	None	None	None	None
Type of Container	aG	aG	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1 A# 10-9-12	1	1	1	1	1	1	1	1	1	1
Volume	~~120mL~~ 60 ml	~~120mL~~ 60ml	500ml	60mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	See item (1) in Special Instructions.	Isotopic Uranium	Isotopic Plutonium	Isotopic Thorium	Americium-241/Curium-244	Strontium-89/90 -- Total Sr	Technetium-99	Total Uranium	
						TRE	10-9-12			RCF	

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2T9	SOIL	10-9-12	0952	✓	✓								34401

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LVI Miranda Simonds	10/9/12 1105	WCH SM Sexton	KOS 10/9/12
SM Sexton	10/9/12 1120	A. Freier	10-9-12 1130
Fed Ex		10-9-12 CMB	
WCH A. Freier	10-9-12 1235	Fed Ex	
	10-10-12 0945	Victor Hernandez	10-10-12 0945

SPECIAL INSTRUCTIONS

(1) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65}

REVIEWED BY CMB DATE 10-9-12

Matrix *

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

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

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford RC-148 Date: 10/10/12

Project/SAF/SOW/Release #:

LvL Batch #: 1210029 Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 799152882198
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-12-023
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☐ N/A

Person Contacted_____ Date _____

SR-002-B.doc

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: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

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 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Date Received: 10-10-2012

SEMIVOLATILE

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples was extracted 10-11-2012 and analyzed 10-12-2012 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 TCL 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. The results presented in this report are derived from samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. Samples were extracted and analyzed within holding time.

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

4. All surrogate recoveries were within acceptance criteria

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

6. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12MS183) has been enclosed.

7. All matrix spike recoveries were within acceptance criteria.

8. The samples were reported on a dry weight basis.

9. 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.

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

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

12. 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").

13. 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

11/19/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS183

Initiator: Sharm Saylor
Date: 10-19-12
Client: WEHanford

Batch: 1210029-
Samples: L210085-BS1
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: SOIL
Prep Batch: L210085

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 in L210085-BS1 (16%) but L210085-MS1 and L210085-MSD1 are OK

2. Known or Probable Causes(s) Acidic phenols subject to erratic chromatographic behavior. All other Spikes within criteria. All surrogates within criteria

Rec 10/19/12

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: 11/14/12

✓ 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: 11/14/12 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: 7.38 CALIBRATION: 1210022

>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:	K3999
Client:	WC-Hanford, Inc.	Project:	RC-148
Sequence:	2100093	Instrument:	HP5972N
Matrix:	Solid	Calibration:	1210022

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2100093-TUN1	N101001.D	10/10/12 12:38
Cal Standard	2100093-CAL5	N101007.D	10/10/12 16:53
Cal Standard	2100093-CAL1	N101008.D	10/10/12 17:34
Cal Standard	2100093-CAL2	N101009.D	10/10/12 18:16
Cal Standard	2100093-CAL3	N101010.D	10/10/12 18:57
Cal Standard	2100093-CAL4	N101011.D	10/10/12 19:38
Secondary Cal Check	2100093-SCV1	N101012.D	10/10/12 20:20

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K3999
Client:	WC-Hanford, Inc.	Project:	RC-148
Sequence:	2100094	Instrument:	HP5972N
Matrix:	Solid	Calibration:	1210022

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2100094-TUN1	N101201.D	10/12/12 13:38
Calibration Check	2100094-CCV1	N101203.D	10/12/12 14:47
LCS	L210085-BS1	N101205.D	10/12/12 16:15
Blank	L210085-BLK1	N101206.D	10/12/12 16:55
J1R2T9	1210029-01	N101210.D	10/12/12 19:37
J1R2T9	L210085-MS1	N101211.D	10/12/12 20:18
J1R2T9	L210085-MSD1	N101212.D	10/12/12 20:58

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
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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

J1R2T9
1210029-01 (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	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
1,2-Dichlorobenzene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
1,3-Dichlorobenzene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
1,4-Dichlorobenzene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4,5-Trichlorophenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4,6-Trichlorophenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4-Dichlorophenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4-Dimethylphenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4-Dinitrophenol	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,4-Dinitrotoluene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2,6-Dinitrotoluene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Chloronaphthalene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Chlorophenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Methylnaphthalene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Methylphenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Nitroaniline	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
2-Nitrophenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
3,3'-Dichlorobenzidine	683	U	683	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
3-Nitroaniline	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4,6-Dinitro-2-methylphenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Bromophenyl Phenyl Ether	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Chloro-3-methylphenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Chloroaniline	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Chlorophenyl Phenyl Ether	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
3- and/or 4-Methylphenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Nitroaniline	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
4-Nitrophenol	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Acenaphthene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Acenaphthylene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Anthracene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Benz[a]anthracene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Benzo[a] pyrene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Benzo[b] fluoranthene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Benzo[g,h,i] perylene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Benzo[k] fluoranthene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Bis(2-chloroethoxy) methane	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

J1R2T9
1210029-01 (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	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Bis(2-chloroisopropyl) ether	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Bis(2-ethylhexyl) phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Butyl Benzyl Phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Carbazole	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Chrysene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Dibenz[a,h]anthracene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Dibenzofuran	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Diethyl Phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Dimethyl Phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Di-n-butyl Phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Di-n-octyl Phthalate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Fluoranthene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Fluorene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Hexachlorobenzene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Hexachlorobutadiene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Hexachlorocyclopentadiene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Hexachloroethane	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Indeno[1,2,3-cd]pyrene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Isophorone	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Naphthalene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Nitrobenzene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
N-Nitrosodi-n-propylamine	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
N-Nitrosodiphenylamine	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Pentachlorophenol	1710	U	1710	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Phenanthrene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Phenol	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Pyrene	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
TIC:Aldol Condensate 1	**1060**	A, B, J		ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
TIC:Aldol Condensate 2	**66300**	A, B, J		ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
TIC:Aldol Condensate 3	**262**	A, B, J		ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
TIC:Unknown 1	**181**	B, J		ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
TIC:Unknown 2	**667**	B, J		ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Tributylphosphate	341	U	341	ug/kg dry	1	L210085	10/11/2012	10/12/2012	8270C
Surrogate: 2-Fluorophenol	*54 %*		*25-121*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*
Surrogate: Phenol-d5	*53 %*		*24-113*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

J1R2T9

1210029-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: Nitrobenzene-d5	*53 %*	*23-120*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*56 %*	*30-115*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*32 %*	*19-122*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*69 %*	*18-137*			*L210085*	*10/11/2012*	*10/12/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Blank (L210085-BLK1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
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.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Blank (L210085-BLK1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
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	1010	J		ug/kg wet						
Unknown 1	515	J		ug/kg wet						
Aldol Condensate 2	108000	A, J		ug/kg wet						
Aldol Condensate 3 RSOW 10/19/12	503	A, J		ug/kg wet						
Aldol Condensate 1	1890	A, J		ug/kg wet						
Tributylphosphate	330	U	330	ug/kg wet						
Surrogate: 2-Fluorophenol	*1740*			*ug/kg wet*	*2500.0*		*70*	*25-121*		
Surrogate: Phenol-d5	*1790*			*ug/kg wet*	*2500.0*		*72*	*24-113*		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Blank (L210085-BLK1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
Surrogate: Nitrobenzene-d5	*1200*			*ug/kg wet*	*1666.7*		*72*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1280*			*ug/kg wet*	*1666.7*		*77*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1390*			*ug/kg wet*	*2500.0*		*56*	*19-122*		
Surrogate: p-Terphenyl-d14	*1420*			*ug/kg wet*	*1666.7*		*85*	*18-137*		
LCS (L210085-BS1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
1,2,4-Trichlorobenzene	1030		330	ug/kg wet	2000.0		51	45-110		
1,2-Dichlorobenzene	1240		330	ug/kg wet	2000.0		62	45-105		
1,3-Dichlorobenzene	1210		330	ug/kg wet	2000.0		61	40-100		
1,4-Dichlorobenzene	1240		330	ug/kg wet	2000.0		62	35-105		
2,4,5-Trichlorophenol	1190		330	ug/kg wet	2000.0		60	30-140		
2,4,6-Trichlorophenol	762		330	ug/kg wet	2000.0		38	20-110		
2,4-Dichlorophenol	989		330	ug/kg wet	2000.0		49	40-110		
2,4-Dimethylphenol	1020		330	ug/kg wet	2000.0		51	30-105		
2,4-Dinitrophenol	320	J	1650	ug/kg wet	2000.0		16*	25-130		
2,4-Dinitrotoluene	1520		330	ug/kg wet	2000.0		76	50-115		
2,6-Dinitrotoluene	1410		330	ug/kg wet	2000.0		70	40-120		
2-Chloronaphthalene	1220		330	ug/kg wet	2000.0		61	45-115		
2-Chlorophenol	1300		330	ug/kg wet	2000.0		65	45-105		
2-Methylnaphthalene	1050		330	ug/kg wet	2000.0		53	45-110		
2-Methylphenol	1140		330	ug/kg wet	2000.0		57	40-120		
2-Nitroaniline	1340	J	1650	ug/kg wet	2000.0		67	45-120		
2-Nitrophenol	1070		330	ug/kg wet	2000.0		53	40-110		
3,3'-Dichlorobenzidine	1620		660	ug/kg wet	2000.0		81	15-130		
3-Nitroaniline	1480	J	1650	ug/kg wet	2000.0		74	40-130		
4,6-Dinitro-2-methylphenol	547		330	ug/kg wet	2000.0		27	20-140		
4-Bromophenyl Phenyl Ether	1210		330	ug/kg wet	2000.0		61	45-115		
4-Chloro-3-methylphenol	1180		330	ug/kg wet	2000.0		59	35-115		
4-Chloroaniline	1120		330	ug/kg wet	2000.0		56	10-100		
4-Chlorophenyl Phenyl Ether	1330		330	ug/kg wet	2000.0		67	45-110		
3- and/or 4-Methylphenol	1200		330	ug/kg wet	2000.0		60	40-120		
4-Nitroaniline	1730		1650	ug/kg wet	2000.0		86	40-130		
4-Nitrophenol	1440	J	1650	ug/kg wet	2000.0		72	15-140		
Acenaphthene	1280		330	ug/kg wet	2000.0		64	45-110		
Acenaphthylene	1390		330	ug/kg wet	2000.0		69	45-115		
Anthracene	1320		330	ug/kg wet	2000.0		66	45-130		
Benz[a]anthracene	1410		330	ug/kg wet	2000.0		71	45-130		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
LCS (L210085-BS1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
Benzo[a] pyrene	1350		330	ug/kg wet	2000.0		67	45-130		
Benzo[b] fluoranthene	1270		330	ug/kg wet	2000.0		63	40-130		
Benzo[g,h,i] perylene	1350		330	ug/kg wet	2000.0		67	45-125		
Benzo[k] fluoranthene	1400		330	ug/kg wet	2000.0		70	45-125		
Bis(2-chloroethoxy) methane	956		330	ug/kg wet	2000.0		48	45-110		
Bis(2-chloroethyl) ether	1030		330	ug/kg wet	2000.0		52	40-110		
Bis(2-chloroisopropyl) ether	1000		330	ug/kg wet	2000.0		50	30-115		
Bis(2-ethylhexyl) phthalate	1460		330	ug/kg wet	2000.0		73	40-145		
Butyl Benzyl Phthalate	1550		330	ug/kg wet	2000.0		78	50-125		
Carbazole	1450		330	ug/kg wet	2000.0		72	40-140		
Chrysene	1480		330	ug/kg wet	2000.0		74	45-130		
Dibenz[a,h]anthracene	898		330	ug/kg wet	2000.0		45	45-125		
Dibenzofuran	1380		330	ug/kg wet	2000.0		69	45-120		
Diethyl Phthalate	1380		330	ug/kg wet	2000.0		69	50-125		
Dimethyl Phthalate	1300		330	ug/kg wet	2000.0		65	45-130		
Di-n-butyl Phthalate	1320		330	ug/kg wet	2000.0		66	50-130		
Di-n-octyl Phthalate	1430		330	ug/kg wet	2000.0		71	40-150		
Fluoranthene	1410		330	ug/kg wet	2000.0		71	45-130		
Fluorene	1380		330	ug/kg wet	2000.0		69	45-120		
Hexachlorobenzene	1310		330	ug/kg wet	2000.0		66	45-130		
Hexachlorobutadiene	1120		330	ug/kg wet	2000.0		56	45-105		
Hexachlorocyclopentadiene	1080		330	ug/kg wet	2000.0		54	10-100		
Hexachloroethane	1240		330	ug/kg wet	2000.0		62	35-110		
Indeno[1,2,3-cd]pyrene	1320		330	ug/kg wet	2000.0		66	45-130		
Isophorone	987		330	ug/kg wet	2000.0		49	40-110		
Naphthalene	1180		330	ug/kg wet	2000.0		59	40-110		
Nitrobenzene	887		330	ug/kg wet	2000.0		44	40-105		
N-Nitrosodi-n-propylamine	1220		330	ug/kg wet	2000.0		61	30-130		
N-Nitrosodiphenylamine	1240		330	ug/kg wet	2000.0		62	50-120		
Pentachlorophenol	747	J	1650	ug/kg wet	2000.0		37	25-120		
Phenanthrene	1340		330	ug/kg wet	2000.0		67	50-120		
Phenol	1170		330	ug/kg wet	2000.0		59	40-115		
Pyrene	1400		330	ug/kg wet	2000.0		70	45-125		
Surrogate: 2-Fluorophenol	*1530*			*ug/kg wet*	*2500.0*		*61*	*25-121*		
Surrogate: Phenol-d5	*1640*			*ug/kg wet*	*2500.0*		*65*	*24-113*		
Surrogate: Nitrobenzene-d5	*856*			*ug/kg wet*	*1666.7*		*51*	*23-120*		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
LCS (L210085-BS1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
Surrogate: 2-Fluorobiphenyl	*1110*			*ug/kg wet*	*1666.7*		*67*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*756*			*ug/kg wet*	*2500.0*		*30*	*19-122*		
Surrogate: p-Terphenyl-d14	*1120*			*ug/kg wet*	*1666.7*		*67*	*18-137*		
Matrix Spike (L210085-MS1)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012						
1,2,4-Trichlorobenzene	1010		338	ug/kg dry	2048.3	341 U	49	45-110		
1,2-Dichlorobenzene	1160		338	ug/kg dry	2048.3	341 U	57	45-105		
1,3-Dichlorobenzene	1080		338	ug/kg dry	2048.3	341 U	53	40-100		
1,4-Dichlorobenzene	1130		338	ug/kg dry	2048.3	341 U	55	35-105		
2,4,5-Trichlorophenol	1130		338	ug/kg dry	2048.3	341 U	55	30-140		
2,4,6-Trichlorophenol	721		338	ug/kg dry	2048.3	341 U	35	20-110		
2,4-Dichlorophenol	1030		338	ug/kg dry	2048.3	341 U	50	40-110		
2,4-Dimethylphenol	1060		338	ug/kg dry	2048.3	341 U	52	30-105		
2,4-Dinitrophenol	1200	J	1690	ug/kg dry	2048.3	1710 U	58	25-130		
2,4-Dinitrotoluene	1620		338	ug/kg dry	2048.3	341 U	79	50-115		
2,6-Dinitrotoluene	1500		338	ug/kg dry	2048.3	341 U	73	40-120		
2-Chloronaphthalene	1270		338	ug/kg dry	2048.3	341 U	62	45-115		
2-Chlorophenol	1310		338	ug/kg dry	2048.3	341 U	64	45-105		
2-Methylnaphthalene	1110		338	ug/kg dry	2048.3	341 U	54	45-110		
2-Methylphenol	1180		338	ug/kg dry	2048.3	341 U	57	40-120		
2-Nitroaniline	1380	J	1690	ug/kg dry	2048.3	1710 U	67	45-120		
2-Nitrophenol	1060		338	ug/kg dry	2048.3	341 U	52	40-110		
3,3'-Dichlorobenzidine	1690		676	ug/kg dry	2048.3	683 U	83	15-130		
3-Nitroaniline	1430	J	1690	ug/kg dry	2048.3	1710 U	70	40-130		
4,6-Dinitro-2-methylphenol	1450		338	ug/kg dry	2048.3	341 U	71	20-140		
4-Bromophenyl Phenyl Ether	1350		338	ug/kg dry	2048.3	341 U	66	45-115		
4-Chloro-3-methylphenol	1250		338	ug/kg dry	2048.3	341 U	61	35-115		
4-Chloroaniline	1050		338	ug/kg dry	2048.3	341 U	51	10-100		
4-Chlorophenyl Phenyl Ether	1440		338	ug/kg dry	2048.3	341 U	70	45-110		
3- and/or 4-Methylphenol	1330		338	ug/kg dry	2048.3	341 U	65	40-120		
4-Nitroaniline	1640	J	1690	ug/kg dry	2048.3	1710 U	80	40-130		
4-Nitrophenol	1350	J	1690	ug/kg dry	2048.3	1710 U	66	15-140		
Acenaphthene	1340		338	ug/kg dry	2048.3	341 U	65	45-110		
Acenaphthylene	1460		338	ug/kg dry	2048.3	341 U	71	45-115		
Anthracene	1450		338	ug/kg dry	2048.3	341 U	71	45-130		
Benz[a]anthracene	1530		338	ug/kg dry	2048.3	341 U	75	45-130		
Benzo[a] pyrene	1480		338	ug/kg dry	2048.3	341 U	72	45-130		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Matrix Spike (L210085-MS1)	**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012							
Benzo[b] fluoranthene	1440		338	ug/kg dry	2048.3	341 U	70	40-130		
Benzo[g,h,i] perylene	1490		338	ug/kg dry	2048.3	341 U	73	45-125		
Benzo[k] fluoranthene	1460		338	ug/kg dry	2048.3	341 U	71	45-125		
Bis(2-chloroethoxy) methane	973		338	ug/kg dry	2048.3	341 U	48	45-110		
Bis(2-chloroethyl) ether	1070		338	ug/kg dry	2048.3	341 U	52	40-110		
Bis(2-chloroisopropyl) ether	1000		338	ug/kg dry	2048.3	341 U	49	30-115		
Bis(2-ethylhexyl) phthalate	1760		338	ug/kg dry	2048.3	341 U	86	40-145		
Butyl Benzyl Phthalate	1870		338	ug/kg dry	2048.3	341 U	91	50-125		
Carbazole	1540		338	ug/kg dry	2048.3	341 U	75	40-140		
Chrysene	1600		338	ug/kg dry	2048.3	341 U	78	45-130		
Dibenz[a,h]anthracene	1010		338	ug/kg dry	2048.3	341 U	49	45-125		
Dibenzofuran	1420		338	ug/kg dry	2048.3	341 U	69	45-120		
Diethyl Phthalate	1490		338	ug/kg dry	2048.3	341 U	73	50-125		
Dimethyl Phthalate	1380		338	ug/kg dry	2048.3	341 U	67	45-130		
Di-n-butyl Phthalate	1450		338	ug/kg dry	2048.3	341 U	71	50-130		
Di-n-octyl Phthalate	1660		338	ug/kg dry	2048.3	341 U	81	40-150		
Fluoranthene	1570		338	ug/kg dry	2048.3	341 U	77	45-130		
Fluorene	1450		338	ug/kg dry	2048.3	341 U	71	45-120		
Hexachlorobenzene	1390		338	ug/kg dry	2048.3	341 U	68	45-130		
Hexachlorobutadiene	1070		338	ug/kg dry	2048.3	341 U	52	45-105		
Hexachlorocyclopentadiene	945		338	ug/kg dry	2048.3	341 U	46	10-100		
Hexachloroethane	1100		338	ug/kg dry	2048.3	341 U	54	35-110		
Indeno[1,2,3-cd]pyrene	1440		338	ug/kg dry	2048.3	341 U	71	45-130		
Isophorone	971		338	ug/kg dry	2048.3	341 U	47	40-110		
Naphthalene	1170		338	ug/kg dry	2048.3	341 U	57	40-110		
Nitrobenzene	926		338	ug/kg dry	2048.3	341 U	45	40-105		
N-Nitrosodi-n-propylamine	1230		338	ug/kg dry	2048.3	341 U	60	30-130		
N-Nitrosodiphenylamine	1350		338	ug/kg dry	2048.3	341 U	66	50-120		
Pentachlorophenol	834	J	1690	ug/kg dry	2048.3	1710 U	41	25-120		
Phenanthrene	1440		338	ug/kg dry	2048.3	341 U	70	50-120		
Phenol	1210		338	ug/kg dry	2048.3	341 U	59	40-115		
Pyrene	1650		338	ug/kg dry	2048.3	341 U	80	45-125		
Surrogate: 2-Fluorophenol	*1570*			*ug/kg dry*	*2560.4*		*61*	*25-121*		
Surrogate: Phenol-d5	*1720*			*ug/kg dry*	*2560.4*		*67*	*24-113*		
Surrogate: Nitrobenzene-d5	*892*			*ug/kg dry*	*1706.9*		*52*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1190*			*ug/kg dry*	*1706.9*		*70*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*788*			*ug/kg dry*	*2560.4*		*31*	*19-122*		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Matrix Spike (L210085-MS1)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012						
Surrogate: p-Terphenyl-d14	*1340*			*ug/kg dry*	*1706.9*		*78*	*18-137*		
Matrix Spike Dup (L210085-MSD1)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012						
1,2,4-Trichlorobenzene	1090		340	ug/kg dry	2061.8	341 U	53	45-110	7	40
1,2-Dichlorobenzene	1310		340	ug/kg dry	2061.8	341 U	64	45-105	12	40
1,3-Dichlorobenzene	1230		340	ug/kg dry	2061.8	341 U	60	40-100	13	40
1,4-Dichlorobenzene	1260		340	ug/kg dry	2061.8	341 U	61	35-105	10	40
2,4,5-Trichlorophenol	1400		340	ug/kg dry	2061.8	341 U	68	30-140	20	40
2,4,6-Trichlorophenol	968		340	ug/kg dry	2061.8	341 U	47	20-110	29	40
2,4-Dichlorophenol	1140		340	ug/kg dry	2061.8	341 U	55	40-110	9	40
2,4-Dimethylphenol	1160		340	ug/kg dry	2061.8	341 U	56	30-105	9	40
2,4-Dinitrophenol	1500	J	1700	ug/kg dry	2061.8	1710 U	73	25-130	22	40
2,4-Dinitrotoluene	1800		340	ug/kg dry	2061.8	341 U	87	50-115	10	40
2,6-Dinitrotoluene	1670		340	ug/kg dry	2061.8	341 U	81	40-120	10	40
2-Chloronaphthalene	1390		340	ug/kg dry	2061.8	341 U	68	45-115	9	40
2-Chlorophenol	1390		340	ug/kg dry	2061.8	341 U	67	45-105	5	40
2-Methylnaphthalene	1160		340	ug/kg dry	2061.8	341 U	56	45-110	4	40
2-Methylphenol	1300		340	ug/kg dry	2061.8	341 U	63	40-120	9	40
2-Nitroaniline	1620	J	1700	ug/kg dry	2061.8	1710 U	79	45-120	15	40
2-Nitrophenol	1160		340	ug/kg dry	2061.8	341 U	56	40-110	8	40
3,3'-Dichlorobenzidine	1990		680	ug/kg dry	2061.8	683 U	97	15-130	15	40
3-Nitroaniline	1680	J	1700	ug/kg dry	2061.8	1710 U	81	40-130	15	40
4,6-Dinitro-2-methylphenol	1790		340	ug/kg dry	2061.8	341 U	87	20-140	20	40
4-Bromophenyl Phenyl Ether	1550		340	ug/kg dry	2061.8	341 U	75	45-115	13	40
4-Chloro-3-methylphenol	1390		340	ug/kg dry	2061.8	341 U	68	35-115	10	40
4-Chloroaniline	1140		340	ug/kg dry	2061.8	341 U	55	10-100	8	40
4-Chlorophenyl Phenyl Ether	1580		340	ug/kg dry	2061.8	341 U	76	45-110	9	40
3- and/or 4-Methylphenol	1450		340	ug/kg dry	2061.8	341 U	70	40-120	8	40
4-Nitroaniline	1910		1700	ug/kg dry	2061.8	1710 U	92	40-130	14	40
4-Nitrophenol	1550	J	1700	ug/kg dry	2061.8	1710 U	75	15-140	13	40
Acenaphthene	1500		340	ug/kg dry	2061.8	341 U	73	45-110	11	40
Acenaphthylene	1620		340	ug/kg dry	2061.8	341 U	79	45-115	10	40
Anthracene	1680		340	ug/kg dry	2061.8	341 U	82	45-130	14	40
Benz[a]anthracene	1780		340	ug/kg dry	2061.8	341 U	86	45-130	14	40
Benzo[a] pyrene	1660		340	ug/kg dry	2061.8	341 U	80	45-130	10	40
Benzo[b] fluoranthene	1520		340	ug/kg dry	2061.8	341 U	73	40-130	4	40
Benzo[g,h,i] perylene	1690		340	ug/kg dry	2061.8	341 U	82	45-125	12	40

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/19/2012 10:41

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 L210085 - SW 3540C										
Matrix Spike Dup (L210085-MSD1)	**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012							
Benzo[k] fluoranthene	1770		340	ug/kg dry	2061.8	341 U	86	45-125	18	40
Bis(2-chloroethoxy) methane	1050		340	ug/kg dry	2061.8	341 U	51	45-110	7	40
Bis(2-chloroethyl) ether	1130		340	ug/kg dry	2061.8	341 U	55	40-110	5	40
Bis(2-chloroisopropyl) ether	1080		340	ug/kg dry	2061.8	341 U	52	30-115	6	40
Bis(2-ethylhexyl) phthalate	2020		340	ug/kg dry	2061.8	341 U	98	40-145	13	40
Butyl Benzyl Phthalate	1960		340	ug/kg dry	2061.8	341 U	95	50-125	4	40
Carbazole	1780		340	ug/kg dry	2061.8	341 U	86	40-140	14	40
Chrysene	1800		340	ug/kg dry	2061.8	341 U	87	45-130	11	40
Dibenz[a,h]anthracene	1160		340	ug/kg dry	2061.8	341 U	56	45-125	13	40
Dibenzofuran	1600		340	ug/kg dry	2061.8	341 U	77	45-120	11	40
Diethyl Phthalate	1630		340	ug/kg dry	2061.8	341 U	79	50-125	8	40
Dimethyl Phthalate	1580		340	ug/kg dry	2061.8	341 U	76	45-130	12	40
Di-n-butyl Phthalate	1670		340	ug/kg dry	2061.8	341 U	81	50-130	14	40
Di-n-octyl Phthalate	1910		340	ug/kg dry	2061.8	341 U	93	40-150	14	40
Fluoranthene	1740		340	ug/kg dry	2061.8	341 U	84	45-130	9	40
Fluorene	1590		340	ug/kg dry	2061.8	341 U	77	45-120	9	40
Hexachlorobenzene	1630		340	ug/kg dry	2061.8	341 U	79	45-130	15	40
Hexachlorobutadiene	1150		340	ug/kg dry	2061.8	341 U	56	45-105	7	40
Hexachlorocyclopentadiene	826		340	ug/kg dry	2061.8	341 U	40	10-100	14	40
Hexachloroethane	1240		340	ug/kg dry	2061.8	341 U	60	35-110	11	40
Indeno[1,2,3-cd]pyrene	1680		340	ug/kg dry	2061.8	341 U	81	45-130	14	40
Isophorone	1070		340	ug/kg dry	2061.8	341 U	52	40-110	9	40
Naphthalene	1270		340	ug/kg dry	2061.8	341 U	62	40-110	7	40
Nitrobenzene	1000		340	ug/kg dry	2061.8	341 U	49	40-105	7	40
N-Nitrosodi-n-propylamine	1310		340	ug/kg dry	2061.8	341 U	64	30-130	6	40
N-Nitrosodiphenylamine	1580		340	ug/kg dry	2061.8	341 U	77	50-120	15	40
Pentachlorophenol	721	J	1700	ug/kg dry	2061.8	1710 U	35	25-120	15	40
Phenanthrene	1670		340	ug/kg dry	2061.8	341 U	81	50-120	14	40
Phenol	1480		340	ug/kg dry	2061.8	341 U	72	40-115	20	40
Pyrene	1830		340	ug/kg dry	2061.8	341 U	89	45-125	10	40
Surrogate: 2-Fluorophenol	*1570*			*ug/kg dry*	*2577.3*		*61*	*25-121*		
Surrogate: Phenol-d5	*1730*			*ug/kg dry*	*2577.3*		*67*	*24-113*		
Surrogate: Nitrobenzene-d5	*906*			*ug/kg dry*	*1718.2*		*53*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1220*			*ug/kg dry*	*1718.2*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*903*			*ug/kg dry*	*2577.3*		*35*	*19-122*		
Surrogate: p-Terphenyl-d14	*1410*			*ug/kg dry*	*1718.2*		*82*	*18-137*		

PREPARATION BENCH SHEET

L210085

Lionville Laboratory

Printed: 10/12/2012 2:08:07PM

000000029

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8270C TCL SVOC	10/11/2012 12:18	30.17	1				500	WC-Hanford, Inc.	
1210034-01	8270C TCL SVOC	10/11/2012 12:18	30.38	1				500	WC-Hanford, Inc.	
L210085-BLK1	QC	10/11/2012 12:18	30	1				500		
L210085-BS1	QC	10/11/2012 12:18	30	1	1201082		600	500		
L210085-MS1	QC	10/11/2012 12:18	30.48	1	1201082	1210029-01	600	500		
L210085-MS2	QC	10/11/2012 12:18	30.14	1	1201082	1210034-01	600	500		
L210085-MSD1	QC	10/11/2012 12:18	30.28	1	1201082	1210029-01	600	500		
L210085-MSD2	QC	10/11/2012 12:18	30.75	1	1201082	1210034-01	600	500		

Extracts Relinquished By — Date: 10/12/12 1410

Extracts Received By — Date: 10/12/12 1410

PESTICIDES

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/23/2012 21:01

Analytical Report for Organochlorine Pesticides by SW846 8081A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-148 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Date Received: 10-10-2012

CHLORINATED PESTICIDES

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples were extracted 10-11-2012 and analyzed 10-15-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8081A for client specified target compounds. The sample received Copper-Sulfur cleanup based on SW846 method 3660A.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy with the exceptions noted on the Sample Receipt Checklist.

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

3. All surrogate recoveries were within acceptance criteria.

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

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All samples required instrument dilutions due to the nature of the matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

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

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

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

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

Iain Daniels
LvL Laboratory Manager

11/8/12
Date

8081A/B Pesticides

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

Analyte	CCV1 10.15.12 9:12:21 AM		CCV2 10.15.12 5:10:58 PM		CCV3 10.15.12 9:02:39 PM		CCV4		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)																
alpha-BHC																
gamma-BHC																
beta-BHC																
delta-BHC				16.8												
Heptachlor																
Aldrin																
Heptachlor epoxide																
gamma chlordane																
alpha chlordane																
Endosulfan I																
4,4'-DDE																
Dieldrin																
Endrin																
4,4'-DDD				19.0												
Endosulfan II																
4,4'-DDT																
Endrin aldehyde																
Endosulfan sulfate																
Methoxychlor																
Endrin ketone																
Toxaphene																
Mean %D or %Drift	4.0	-0.1	3.5	7.6	-2.1	1.9										

Sample results reported from affected CCV:

CCV1: L210084-BIK1, BS1, MS3, MSD3; L210077-BIK1, BS1, BSD1, 1210019-01, 1210034-01

CCV2: 1210029-01, L210084-MS1, MSD1

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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

WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/23/2012 21:01

Organochlorine Pesticides by SW846 8081A

Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R2T9 (1210029-01) Soil										
Surrogate: Tetrachloro-meta-xylene	*95.3 %*		*28-166*				*L210084*	*10/11/2012 12:12*	*10/15/2012 18:28*	*8081A*
Surrogate: Decachlorobiphenyl	*93.8 %*		*37-153*				*L210084*	*10/11/2012 12:12*	*10/15/2012 18:28*	*8081A*
alpha-BHC	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
gamma-BHC	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
beta-BHC	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
delta-BHC	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Heptachlor	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Aldrin	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Heptachlor epoxide	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
gamma-Chlordane	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
alpha-Chlordane	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endosulfan I	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
4,4'-DDE	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Dieldrin	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endrin	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
4,4'-DDD	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endosulfan II	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
4,4'-DDT	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endrin aldehyde	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endosulfan sulfate	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Methoxychlor	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Endrin ketone	1.38	U	1.38	6.92	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A
Toxaphene	20.7	U	20.7	69.2	ug/kg dry	4	L210084	10/11/2012 12:12	10/15/2012 18:28	8081A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/23/2012 21:01

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210084 - SW 3540C										
Blank (L210084-BLK1)				Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 10:44						
alpha-BHC	0.333 U	0.333	1.67	ug/kg wet						
gamma-BHC	0.333 U	0.333	1.67	ug/kg wet						
beta-BHC	0.333 U	0.333	1.67	ug/kg wet						
delta-BHC	0.333 U	0.333	1.67	ug/kg wet						
Heptachlor	0.333 U	0.333	1.67	ug/kg wet						
Aldrin	0.333 U	0.333	1.67	ug/kg wet						
Heptachlor epoxide	0.333 U	0.333	1.67	ug/kg wet						
gamma-Chlordane	0.333 U	0.333	1.67	ug/kg wet						
alpha-Chlordane	0.333 U	0.333	1.67	ug/kg wet						
Endosulfan I	0.333 U	0.333	1.67	ug/kg wet						
4,4'-DDE	0.333 U	0.333	1.67	ug/kg wet						
Dieldrin	0.333 U	0.333	1.67	ug/kg wet						
Endrin	0.333 U	0.333	1.67	ug/kg wet						
4,4'-DDD	0.333 U	0.333	1.67	ug/kg wet						
Endosulfan II	0.333 U	0.333	1.67	ug/kg wet						
4,4'-DDT	0.333 U	0.333	1.67	ug/kg wet						
Endrin aldehyde	0.333 U	0.333	1.67	ug/kg wet						
Endosulfan sulfate	0.333 U	0.333	1.67	ug/kg wet						
Methoxychlor	0.333 U	0.333	1.67	ug/kg wet						
Endrin ketone	0.333 U	0.333	1.67	ug/kg wet						
Toxaphene	5.00 U	5.00	16.7	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*28.0*			*ug/kg wet*	*33.337*		*84.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*28.7*			*ug/kg wet*	*33.333*		*86.0*	*37-153*		
LCS (L210084-BS1)				Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 11:23						
alpha-BHC	30.3	0.333	1.67	ug/kg wet	33.333		91.0	65-145		
gamma-BHC	30.0	0.333	1.67	ug/kg wet	33.333		90.0	70-143		
beta-BHC	28.0	0.333	1.67	ug/kg wet	33.333		84.0	75-143		
delta-BHC	28.7	0.333	1.67	ug/kg wet	33.333		86.0	65-143		
Heptachlor	28.0	0.333	1.67	ug/kg wet	33.333		84.0	70-139		
Aldrin	27.7	0.333	1.67	ug/kg wet	33.333		83.0	70-143		
Heptachlor epoxide	28.7	0.333	1.67	ug/kg wet	33.333		86.0	71-138		
gamma-Chlordane	29.0	0.333	1.67	ug/kg wet	33.333		87.0	71-137		
alpha-Chlordane	28.7	0.333	1.67	ug/kg wet	33.333		86.0	72-136		

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Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210084 - SW 3540C										
LCS (L210084-BS1)				Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 11:23						
Endosulfan I	29.0	0.333	1.67	ug/kg wet	33.333		87.0	72-139		
4,4'-DDE	32.0	0.333	1.67	ug/kg wet	33.333		96.0	70-154		
Dieldrin	29.3	0.333	1.67	ug/kg wet	33.333		88.0	73-143		
Endrin	30.3	0.333	1.67	ug/kg wet	33.333		91.0	74-137		
4,4'-DDD	28.0	0.333	1.67	ug/kg wet	33.333		84.0	52-153		
Endosulfan II	28.7	0.333	1.67	ug/kg wet	33.333		86.0	72-139		
4,4'-DDT	30.7	0.333	1.67	ug/kg wet	33.333		92.0	58-148		
Endrin aldehyde	18.3	0.333	1.67	ug/kg wet	33.333		55.0	49-129		
Endosulfan sulfate	27.7	0.333	1.67	ug/kg wet	33.333		83.0	66-139		
Methoxychlor	29.3	0.333	1.67	ug/kg wet	33.333		88.0	50-144		
Endrin ketone	29.0	0.333	1.67	ug/kg wet	33.333		87.0	70-139		
Surrogate: Tetrachloro-meta-xylene	*26.0*			*ug/kg wet*	*33.337*		*78.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*28.3*			*ug/kg wet*	*33.333*		*85.0*	*37-153*		
Matrix Spike (L210084-MS1)		**Source: 1210029-01**		Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 19:06						
alpha-BHC	34.1 D	1.36	6.83	ug/kg dry	34.105	1.38 U	99.9	65-145		
gamma-BHC	34.0 D	1.36	6.83	ug/kg dry	34.105	1.38 U	99.6	70-143		
beta-BHC	36.6 D	1.36	6.83	ug/kg dry	34.105	1.38 U	107	75-143		
delta-BHC	30.1 D	1.36	6.83	ug/kg dry	34.105	1.38 U	88.4	65-143		
Heptachlor	32.5 D	1.36	6.83	ug/kg dry	34.105	1.38 U	95.2	70-139		
Aldrin	32.5 D	1.36	6.83	ug/kg dry	34.105	1.38 U	95.2	70-143		
Heptachlor epoxide	32.2 D	1.36	6.83	ug/kg dry	34.105	1.38 U	94.3	71-138		
gamma-Chlordane	27.5 D	1.36	6.83	ug/kg dry	34.105	1.38 U	80.5	71-137		
alpha-Chlordane	28.6 D	1.36	6.83	ug/kg dry	34.105	1.38 U	83.8	72-136		
Endosulfan I	26.5 D	1.36	6.83	ug/kg dry	34.105	1.38 U	77.6	72-139		
4,4'-DDE	31.4 D	1.36	6.83	ug/kg dry	34.105	1.38 U	92.0	70-154		
Dieldrin	30.3 D	1.36	6.83	ug/kg dry	34.105	1.38 U	88.7	73-143		
Endrin	35.7 D	1.36	6.83	ug/kg dry	34.105	1.38 U	105	74-137		
4,4'-DDD	29.9 D	1.36	6.83	ug/kg dry	34.105	1.38 U	87.8	52-153		
Endosulfan II	31.7 D	1.36	6.83	ug/kg dry	34.105	1.38 U	93.0	72-139		
4,4'-DDT	36.8 D	1.36	6.83	ug/kg dry	34.105	1.38 U	108	58-148		
Endrin aldehyde	29.2 D	1.36	6.83	ug/kg dry	34.105	1.38 U	85.5	49-129		
Endosulfan sulfate	33.7 D	1.36	6.83	ug/kg dry	34.105	1.38 U	98.8	66-139		
Methoxychlor	37.8 D	1.36	6.83	ug/kg dry	34.105	1.38 U	111	50-144		

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/23/2012 21:01

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210084 - SW 3540C											
Matrix Spike (L210084-MS1)		**Source: 1210029-01**			Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 19:06						
Endrin ketone	34.5	D	1.36	6.83	ug/kg dry	34.105	1.38 U	101	70-139		
Surrogate: Tetrachloro-meta-xylene	*30.9*				*ug/kg dry*	*34.108*		*90.7*	*28-166*		
Surrogate: Decachlorobiphenyl	*33.0*				*ug/kg dry*	*34.105*		*96.7*	*37-153*		
Matrix Spike Dup (L210084-MSD1)		**Source: 1210029-01**			Prepared: 10/11/2012 12:12 Analyzed: 10/15/2012 19:45						
alpha-BHC	24.4	D	1.34	6.74	ug/kg dry	33.631	1.38 U	72.6	65-145	31.7	40
gamma-BHC	25.4	D	1.34	6.74	ug/kg dry	33.631	1.38 U	75.6	70-143	27.4	40
beta-BHC	27.5	D	1.34	6.74	ug/kg dry	33.631	1.38 U	81.8	75-143	27.1	40
delta-BHC	22.5	D	1.34	6.74	ug/kg dry	33.631	1.38 U	66.9	65-143	27.7	40
Heptachlor	26.5	D	1.34	6.74	ug/kg dry	33.631	1.38 U	78.9	70-139	18.7	40
Aldrin	24.3	D	1.34	6.74	ug/kg dry	33.631	1.38 U	72.4	70-143	27.2	40
Heptachlor epoxide	25.9	D	1.34	6.74	ug/kg dry	33.631	1.38 U	77.1	71-138	20.1	40
gamma-Chlordane	26.7	D	1.34	6.74	ug/kg dry	33.631	1.38 U	79.4	71-137	1.38	40
alpha-Chlordane	27.7	D	1.34	6.74	ug/kg dry	33.631	1.38 U	82.3	72-136	1.81	40
Endosulfan I	26.5	D	1.34	6.74	ug/kg dry	33.631	1.38 U	78.7	72-139	1.41	40
4,4'-DDE	27.6	D	1.34	6.74	ug/kg dry	33.631	1.38 U	82.0	70-154	11.5	40
Dieldrin	26.2	D	1.34	6.74	ug/kg dry	33.631	1.38 U	77.8	73-143	13.1	40
Endrin	28.6	D	1.34	6.74	ug/kg dry	33.631	1.38 U	85.1	74-137	20.7	40
4,4'-DDD	24.0	D	1.34	6.74	ug/kg dry	33.631	1.38 U	71.4	52-153	20.6	40
Endosulfan II	26.0	D	1.34	6.74	ug/kg dry	33.631	1.38 U	77.3	72-139	18.4	40
4,4'-DDT	29.3	D	1.34	6.74	ug/kg dry	33.631	1.38 U	87.0	58-148	21.5	40
Endrin aldehyde	22.8	D	1.34	6.74	ug/kg dry	33.631	1.38 U	67.7	49-129	23.2	40
Endosulfan sulfate	27.5	D	1.34	6.74	ug/kg dry	33.631	1.38 U	81.7	66-139	18.9	40
Methoxychlor	30.8	D	1.34	6.74	ug/kg dry	33.631	1.38 U	91.7	50-144	19.0	40
Endrin ketone	27.6	D	1.34	6.74	ug/kg dry	33.631	1.38 U	82.0	70-139	21.1	40
Surrogate: Tetrachloro-meta-xylene	*26.5*				*ug/kg dry*	*33.634*		*78.7*	*28-166*		
Surrogate: Decachlorobiphenyl	*27.8*				*ug/kg dry*	*33.631*		*82.7*	*37-153*		

PREPARATION BENCH SHEET

L210084

Lionville Laboratory

Printed: 10/12/2012 2:17:54PM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8081A TCL Pesticides	10/11/2012 12:12	30.12	10				250	WC-Hanford, Inc.	
1210029-01	8082 PCBs	10/11/2012 12:12	30.12	10				250	WC-Hanford, Inc.	
1210034-01	8081A TCL Pesticides	10/11/2012 12:12	30.13	10				250	WC-Hanford, Inc.	
1210034-01	8082 PCBs	10/11/2012 12:12	30.13	10				250	WC-Hanford, Inc.	
L210084-BLK1	QC	10/11/2012 12:12	30	10				250		pest
L210084-BLK2	QC	10/11/2012 12:12	30	10				250		pcb
L210084-BS1	QC	10/11/2012 12:12	30	10	1200903		250	250		pest
L210084-BS2	QC	10/11/2012 12:12	30	10	1200902		250	250		pcb
L210084-MS1	QC	10/11/2012 12:12	30.51	10	1200903	1210029-01	250	250		pest
L210084-MS2	QC	10/11/2012 12:12	30.38	10	1200902	1210029-01	250	250		pcb
L210084-MS3	QC	10/11/2012 12:12	30.8	10	1200903	1210034-01	250	250		pest
L210084-MS4	QC	10/11/2012 12:12	30.38	10	1200902	1210034-01	250	250		pcb
L210084-MSD1	QC	10/11/2012 12:12	30.94	10	1200903	1210029-01	250	250		pest
L210084-MSD2	QC	10/11/2012 12:12	30.48	10	1200902	1210029-01	250	250		pcb
L210084-MSD3	QC	10/11/2012 12:12	30.18	10	1200903	1210034-01	250	250		pest
L210084-MSD4	QC	10/11/2012 12:12	30.71	10	1200902	1210034-01	250	250		pcb

S cleared 10.15.12 SZ
Cu lot# B10X036

Extracts Relinquished By — Date 10/12/12 1450 — Extracts Received By SZ — Date 10.15.12 7:15

00000040

Lionville Laboratory Use Only: L2/0029

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: SH TAT: 21
Date Rec'd: 10/10/12 Date Due: 10/31/12

	A	B	C	D	E	F	G	H	I	J	K	L
Refrigerator #	1	1	1	1	1	1	1	1	1	1	1	1
#/Type Container (Solid)	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG
Volume (Solid)	60	60	60	60	60	60	60	60	60	60	60	250
Preservatives	—	—	—	—	—	—	—	—	—	—	—	—
ANALYSES REQUESTED (ORGANIC)	VOA	BNA	~~Pest~~ PCB	CHLORO Herb	PAHs	Pest	WPHD	INORG Metal Hg	CN	SULFIDE	PH	Cr6
Lionville Laboratory Use Only		TCL+TBP 8270	8082	8151	8310	8081	DRO/MO	METALS	CYANIDE	SULFIDE	PH	Cr6+

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	TC and ANIONS	Ethylene Glycol	TBP Butyl Phosphate
	01	J1R2T9	✓	✓	Soil	10-9-12	0952	X	X	X

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

Special Instructions: MATRIX QC

METALS = HSL+B, Li, Mo, Si, U, Zr (NoTL)
NonHaloVOA = Ethylene Glycol only
8270 BNA = TCL + TBP

Special Instructions:
10/10/12 1. TBP will be reported from BNA run osj
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
[signature]	[signature]	10/10/12	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page 1 of ~~12~~ TRE 10-9-12
Collector: M. Simonds	Company Contact: Tom Edmundson; Telephone No. TRE 10-9-12 509-~~967-5673~~ 947-5192	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location: 308 Ramp Composite #1	SAF No.: RC-148	
Ice Chest No.: WCH-12-023	Field Logbook No.: EL-1518-26; COA: R308A0J453	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A110539	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive <DOT Limits

Special Handling and/or Storage
Cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G/P	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	AJ 1 10-9-12	1	1	1	1	1
Volume	60mL	60mL	60mL	60mL	~~60mL~~ ~~120mL~~ ~~60mL~~	250mL	~~120mL~~ 60ml	~~250mL~~ ~~60ml~~ ~~120mL~~ AJ 10-9-12	~~120mL~~ 60 ml	~~120mL~~ 60 ml
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2	pH (Soil) - 9045	Total Cyanide - 9010; Sulfides - 9030	~~TOC - 9060~~ TRE 10-9-12 GC-8015M (Ethylene glycol, Tributyl phosphate)	TPH-Diesel Range - WTPH-D +	Semi-VOA - 8270A (TCL) SMS 10/9/12	PCBs - 8082	PAHs - 8310

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2T9	SOIL	10-9-12	0952	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

RCF 3440

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LVI MIRANDA SIMONDS	10/9/12 1105	WCH SM DEXTON	10/9/12 1105
SM DEXTON	10/9/12 1130	A. Freier	10-9-12 1130
Fed Ex		10-9-12 CMB	
WCH A. Freier	10-9-12 1205	Fed Ex	
Fed Ex	10-10-12 0945	VICTOR HERNANDEZ	10-10-12 0945
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

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

REVIEWED BY CMB DATE 10-9-12

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

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

WCH-EE-011

000000042

TRE 10-9-12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page 2 of ~~2~~ 2

Collector M. Simonds	Company Contact Tom Edmundson	Telephone No. TRE 10-9-12 509-~~967-5673~~-947-5192	Project Coordinator KESSNER, JH
Price Code 8L	Data Turnaround 21 Days		
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 308 Ramp Composite #1		SAF No. RC-148
Ice Chest No. WCH -12- 023	Field Logbook No. EL-1518-26	COA R308A0J453	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A 110539		Bill of Lading/Air Bill No. See OSPC

00000043

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive <DOT Limits

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	None	None	None	None
Type of Container	aG	aG	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1 AJ 10-9-12	1	1	1	1	1	1	1	1	1	1
Volume	~~120mL~~ 60 ml	~~120mL~~ 60ml	500ml	60mL	60mL	60mL	60mL	60mL	60mL	60mL	60mL
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	See item (1) in Special Instructions.	Isotopic Uranium	Isotopic Plutonium	Isotopic Thorium	Americium-241/Curium-244	Strontium-89,90 -- Total Sr	Technetium-99	Total Uranium	
						TRE	10-9-12			RCF	

Sample No.	Matrix *	Sample Date	Sample Time										
J1R2T9	SOIL	10-9-12	0952	✓	✓								34401

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
LVI Miranda Simonds	10/9/12 1105	WCH SM Sexton	KOS 10/9/12
SM Sexton	10/9/12 1130	A. Freier A. Freier	10-9-12 1130
Fed Ex		10-9-12 CMB	
WCH A. Freier A. Freier	10-9-12 1235	Fed Ex	
	10-10-12 0945	Victor Hernandez	10-10-12 0945

SPECIAL INSTRUCTIONS

(1) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65}

REVIEWED BY CMB
DATE 10-9-12

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

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford RC-148 Date: 10/10/12

Project/SAF/SOW/Release #:

LvL Batch #: 1210029 Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FDE		Airbill # 7991528822198
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-12-023
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted_____ Date_____

SR-002-B.doc

PCBs

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-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 21:31

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

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 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Received: 10-10-2012

PCBs

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples were extracted 10-11-2012 and analyzed 10-15-2012 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 samples required 2-fold instrument dilutions due to the matrix.
4. All obtainable surrogate recoveries were within acceptance criteria.
5. The method blank was below the reporting limits for all target compounds.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The samples were reported on a dry weight basis.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria. 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.

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

Iain Daniels
LvL Laboratory Manager

11/8/12
Date

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
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 21:31

J1R2T9
1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1221	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1232	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1242	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1248	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1254	**39.0**	D	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1260	**119**	D	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1262	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Aroclor 1268	27.6	U	27.6	ug/kg dry	2	L210084	10/11/2012	10/15/2012	8082
Surrogate: Decachlorobiphenyl	*122 %*		*43-144*			*L210084*	*10/11/2012*	*10/15/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*120 %*		*52-141*			*L210084*	*10/11/2012*	*10/15/2012*	*8082*

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Phone: 610-280-3000
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 21:31

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 L210084 - SW 3540C										
Blank (L210084-BLK2)				Prepared: 10/11/2012 Analyzed: 10/15/2012						
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	*30.7*			*ug/kg wet*	*33.333*		*92*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.3*			*ug/kg wet*	*33.337*		*106*	*52-141*		
LCS (L210084-BS2)				Prepared: 10/11/2012 Analyzed: 10/15/2012						
Aroclor 1016	159		13.3	ug/kg wet	166.67		95	50-138		
Aroclor 1260	173		13.3	ug/kg wet	166.67		104	50-148		
Surrogate: Decachlorobiphenyl	*31.5*			*ug/kg wet*	*33.333*		*95*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.2*			*ug/kg wet*	*33.337*		*99*	*52-141*		
Matrix Spike (L210084-MS2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/15/2012						
Aroclor 1016	191	D	27.3	ug/kg dry	171.25	27.6 U	112	50-138		
Aroclor 1260	247	D	27.3	ug/kg dry	171.25	119	75	50-148		
Surrogate: Decachlorobiphenyl	*36.2*			*ug/kg dry*	*34.251*		*106*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*38.9*			*ug/kg dry*	*34.254*		*114*	*52-141*		
Matrix Spike Dup (L210084-MSD2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/15/2012						
Aroclor 1016	158	D	27.2	ug/kg dry	170.69	27.6 U	93	50-138	18	40
Aroclor 1260	246	D	27.2	ug/kg dry	170.69	119	74	50-148	0.1	40
Surrogate: Decachlorobiphenyl	*38.1*			*ug/kg dry*	*34.138*		*112*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*27.4*			*ug/kg dry*	*34.142*		*80*	*52-141*		

8082A PCBs

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

Analyte	CCV1 10.15.12 9:15:49 AM		CCV2 10.15.12 5:30:46 PM		CCV3 10.15.12 8:53:09 PM		CCV4		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)	-15.9															
Aroclor 1016-1		16.6		15.9		16.0										
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4																
Aroclor 1016-5																
Aroclor 1260-1																
Aroclor 1260-2																
Aroclor 1260-3																
Aroclor 1260-4																
Aroclor 1260-5																
Mean %D or %Drift	0.7	7.7	4.1	8.2	5.9	11.1										

Sample results reported from affected CCV:

CCV1: L210084-BK2, BS2, MS4, MSD4, 1210034-01

CCV2: 1210029-01, L210084-MS2, MSD2

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

PREPARATION BENCH SHEET

L210084

Lionville Laboratory

Printed: 10/12/2012 2:17:54PM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8081A TCL Pesticides	10/11/2012 12:12	30.12	10				250	WC-Hanford, Inc.	
1210029-01	8082 PCBs	10/11/2012 12:12	30.12	10				250	WC-Hanford, Inc.	
1210034-01	8081A TCL Pesticides	10/11/2012 12:12	30.13	10				250	WC-Hanford, Inc.	
1210034-01	8082 PCBs	10/11/2012 12:12	30.13	10				250	WC-Hanford, Inc.	
L210084-BLK1	QC	10/11/2012 12:12	30	10				250		pest
L210084-BLK2	QC	10/11/2012 12:12	30	10				250		pcb
L210084-BS1	QC	10/11/2012 12:12	30	10	1200903		250	250		pest
L210084-BS2	QC	10/11/2012 12:12	30	10	1200902		250	250		pcb
L210084-MS1	QC	10/11/2012 12:12	30.51	10	1200903	1210029-01	250	250		pest
L210084-MS2	QC	10/11/2012 12:12	30.38	10	1200902	1210029-01	250	250		pcb
L210084-MS3	QC	10/11/2012 12:12	30.8	10	1200903	1210034-01	250	250		pest
L210084-MS4	QC	10/11/2012 12:12	30.38	10	1200902	1210034-01	250	250		pcb
L210084-MSD1	QC	10/11/2012 12:12	30.94	10	1200903	1210029-01	250	250		pest
L210084-MSD2	QC	10/11/2012 12:12	30.48	10	1200902	1210029-01	250	250		pcb
L210084-MSD3	QC	10/11/2012 12:12	30.18	10	1200903	1210034-01	250	250		pest
L210084-MSD4	QC	10/11/2012 12:12	30.71	10	1200902	1210034-01	250	250		pcb

S cleaned 10.15.12 SZ
Cu lot# B10X036

Extracts Relinquished By — Date 10/12/12 1450 — Extracts Received By SZ — Date 10.15.12 7:15

NON-HALOGENATED VOLATILES

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-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/21/2012 10:32

Analytical Report for Non-Halogenated Volatiles by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

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 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Date Received: 10-10-2012

NON-HALOGENATED VOLATILES

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples were prepared and analyzed 10-21-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation and analysis procedure was based on SW846 Method 8015B.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The sample was reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

11/8/12
Date

r:\group\data\2012\8015 non halogenated volatiles\wc hanford\1210029.doc

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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".
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MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/21/2012 10:32

J1R2T9
1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Non-Halogenated Volatiles by SW846 8015									
Ethylene Glycol	40.0	U	40.0	mg/kg	1	L210159	10/21/2012	10/21/2012	SW846 8015M
Surrogate: 1,2-Butanediol	*66 %*		*50-120*			*L210159*	*10/21/2012*	*10/21/2012*	*SW846 8015M*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/21/2012 10:32

Non-Halogenated Volatiles by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210159 - 8015B DIrect Inject										
Blank (L210159-BLK1)				Prepared & Analyzed: 10/21/2012						
Ethylene Glycol	40.0	U	40.0	mg/kg						
Surrogate: 1,2-Butanediol	*152*			*mg/kg*	*200.00*		*76*	*50-120*		
LCS (L210159-BS1)				Prepared & Analyzed: 10/21/2012						
Ethylene Glycol	145		40.0	mg/kg	200.00		72	50-150		
Surrogate: 1,2-Butanediol	*160*			*mg/kg*	*200.00*		*80*	*50-120*		
Matrix Spike (L210159-MS1)		**Source: 1210029-01**		Prepared & Analyzed: 10/21/2012						
Ethylene Glycol	126		40.0	mg/kg	200.00	40.0 U	63	50-150		
Surrogate: 1,2-Butanediol	*158*			*mg/kg*	*200.00*		*79*	*50-120*		
Matrix Spike Dup (L210159-MSD1)		**Source: 1210029-01**		Prepared & Analyzed: 10/21/2012						
Ethylene Glycol	163		40.0	mg/kg	200.00	40.0 U	81	50-150	26	40
Surrogate: 1,2-Butanediol	*168*			*mg/kg*	*200.00*		*84*	*50-120*		

PREPARATION BENCH SHEET

L210159

Lionville Laboratory

Printed: 10/21/2012 7:09:18AM

Matrix: Solid **Prepared using: GC - 8015B DIrect Inject** **Surrogate used: 1200129**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8015C Non-Halogenated Volatiles	10/21/2012 07:04	1	2				20	WC-Hanford, Inc.	
L210159-BLK1	QC	10/21/2012 07:04	1	2				20		
L210159-BS1	QC	10/21/2012 07:04	1	2	1200701		20	20		
L210159-MS1	QC	10/21/2012 07:04	1	2	1200701	1210029-01	20	20		
L210159-MSD1	QC	10/21/2012 07:04	1	2	1200701	1210029-01	20	20		

Catherine Cary 10/21/12

Extracts Relinquished By Date

Extracts Received By Date

DRO/MO

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 08:47

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

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 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Date Received: 10-10-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples were extracted 10-11-2012 and analyzed 10-13-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

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

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

10/26/12
Date

r:\group\data\2012\dro\wc hanford\1210029.doc

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E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
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BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
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NA	=	Not Applicable.
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NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 08:47

J1R2T9

1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	**4010**		3410	ug/kg dry	1	L210089	10/11/2012	10/13/2012	8015M
Motor Oil	**8000**	J	10200	ug/kg dry	1	L210089	10/11/2012	10/13/2012	8015M
Surrogate: p-Terphenyl	*97 %*		*39-129*			*L210089*	*10/11/2012*	*10/13/2012*	*8015M*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 08:47

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210089 - SW 3540C										
Blank (L210089-BLK1)				Prepared: 10/11/2012 Analyzed: 10/13/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*5840*			*ug/kg wet*	*6666.7*		*88*	*39-129*		
LCS (L210089-BS1)				Prepared: 10/11/2012 Analyzed: 10/13/2012						
Diesel Range Organics	48600		3330	ug/kg wet	66667		73	42-133		
Surrogate: p-Terphenyl	*5280*			*ug/kg wet*	*6666.7*		*79*	*39-129*		
Matrix Spike (L210089-MS1)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/13/2012						
Diesel Range Organics	50600		3390	ug/kg dry	67875	4010	69	42-133		
Surrogate: p-Terphenyl	*5710*			*ug/kg dry*	*6787.5*		*84*	*39-129*		
Matrix Spike Dup (L210089-MSD1)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/13/2012						
Diesel Range Organics	54900		3390	ug/kg dry	67898	4010	75	42-133	9	40
Surrogate: p-Terphenyl	*6000*			*ug/kg dry*	*6789.8*		*88*	*39-129*		

PREPARATION BENCH SHEET

L210089

Lionville Laboratory

Printed: 10/12/2012 2:19:32PM

00000067

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1201102

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8015M DRO	10/11/2012 13:52	30.51	1				1000	WC-Hanford, Inc.	
1210034-01	8015M DRO	10/11/2012 13:52	30.61	1				1000	WC-Hanford, Inc.	
L210089-BLK1	QC	10/11/2012 13:52	30	1				1000		
L210089-BS1	QC	10/11/2012 13:52	30	1	1200846		1000	1000		
L210089-MS1	QC	10/11/2012 13:52	30.66	1	1200846	1210029-01	1000	1000		
L210089-MS2	QC	10/11/2012 13:52	30.31	1	1200846	1210034-01	1000	1000		
L210089-MSD1	QC	10/11/2012 13:52	30.65	1	1200846	1210029-01	1000	1000		
L210089-MSD2	QC	10/11/2012 13:52	30.66	1	1200846	1210034-01	1000	1000		

10/12/12 14:50

Extracts Relinquished By Date

Extracts Received By Date

PAHs

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-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/26/2012 15:36

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

LIONVILLE LABORATORY
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Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-148 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001-00
Date Received: 10-10-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 10-09-2012.

The sample and associated QC samples were extracted 10-11-2012 and analyzed 10-15-2012 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.

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Iain Daniels
LvL Laboratory Manager

11/8/12
Date

r:\group\data\2012\pah 8310\wc hanford\1210029.doc
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J1R2T9

1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Acenaphthylene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Acenaphthene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Fluorene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Phenanthrene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Anthracene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Fluoranthene	**2.68**	J	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Indeno[1,2,3-cd]pyrene	**1.99**	J	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Pyrene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Benz[a]anthracene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Chrysene	**0.969**	J	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Benzo[b] fluoranthene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Benzo[k] fluoranthene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Benzo[a] pyrene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Dibenz[a,h]anthracene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Benzo[g,h,i] perylene	3.46	U	3.46	ug/kg dry	1	L210086	10/11/2012	10/15/2012	8310
Surrogate: Triphenylene	*95 %*		*68-129*			*L210086*	*10/11/2012*	*10/15/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/26/2012 15:36

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 L210086 - SW 3540C										
Blank (L210086-BLK1)				Prepared: 10/11/2012 Analyzed: 10/15/2012						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	1.17	J	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	*156*			*ug/kg wet*	*166.67*		*94*	*68-129*		
LCS (L210086-BS1)				Prepared: 10/11/2012 Analyzed: 10/15/2012						
Naphthalene	133		3.33	ug/kg wet	166.67		80	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	142		3.33	ug/kg wet	166.67		85	28-145		
Phenanthrene	145		3.33	ug/kg wet	166.67		87	30-152		
Anthracene	148		3.33	ug/kg wet	166.67		88	19-171		
Fluoranthene	149		3.33	ug/kg wet	166.67		89	34-159		
Indeno[1,2,3-cd]pyrene	152		3.33	ug/kg wet	166.67		91	31-156		
Pyrene	151		3.33	ug/kg wet	166.67		91	33-152		
Benz[a]anthracene	152		3.33	ug/kg wet	166.67		91	32-157		
Chrysene	151		3.33	ug/kg wet	166.67		91	31-159		
Benzo[b] fluoranthene	160		3.33	ug/kg wet	166.67		96	33-164		
Benzo[k] fluoranthene	157		3.33	ug/kg wet	166.67		94	28-161		
Benzo[a] pyrene	149		3.33	ug/kg wet	166.67		89	29-149		
Dibenz[a,h]anthracene	162		3.33	ug/kg wet	166.67		97	27-153		
Benzo[g,h,i] perylene	154		3.33	ug/kg wet	166.67		93	32-157		
Surrogate: Triphenylene	*170*			*ug/kg wet*	*166.67*		*102*	*68-129*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/26/2012 15:36

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 L210086 - SW 3540C									
Matrix Spike (L210086-MS1)		**Source: 1210029-01**	Prepared: 10/11/2012 Analyzed: 10/15/2012						
Naphthalene	124	3.43	ug/kg dry	171.59	3.46 U	72	0-127		
Acenaphthylene	141	3.43	ug/kg dry	171.59	3.46 U	82	50-140		
Acenaphthene	129	3.43	ug/kg dry	171.59	3.46 U	75	17-139		
Fluorene	143	3.43	ug/kg dry	171.59	3.46 U	83	28-145		
Phenanthrene	152	3.43	ug/kg dry	171.59	3.46 U	89	30-152		
Anthracene	158	3.43	ug/kg dry	171.59	3.46 U	92	19-171		
Fluoranthene	155	3.43	ug/kg dry	171.59	2.68	89	34-159		
Indeno[1,2,3-cd]pyrene	144	3.43	ug/kg dry	171.59	1.99	83	31-156		
Pyrene	152	3.43	ug/kg dry	171.59	3.46 U	88	33-152		
Benz[a]anthracene	158	3.43	ug/kg dry	171.59	3.46 U	92	32-157		
Chrysene	156	3.43	ug/kg dry	171.59	0.969	90	31-159		
Benzo[b] fluoranthene	149	3.43	ug/kg dry	171.59	3.46 U	87	33-164		
Benzo[k] fluoranthene	157	3.43	ug/kg dry	171.59	3.46 U	91	28-161		
Benzo[a] pyrene	166	3.43	ug/kg dry	171.59	3.46 U	97	29-149		
Dibenz[a,h]anthracene	155	3.43	ug/kg dry	171.59	3.46 U	91	27-153		
Benzo[g,h,i] perylene	133	3.43	ug/kg dry	171.59	3.46 U	77	32-157		
Surrogate: Triphenylene	*160*		*ug/kg dry*	*171.59*		*93*	*68-129*		
Matrix Spike Dup (L210086-MSD1)		**Source: 1210029-01**	Prepared: 10/11/2012 Analyzed: 10/15/2012						
Naphthalene	138	3.41	ug/kg dry	170.47	3.46 U	81	0-127	11	40
Acenaphthylene	146	3.41	ug/kg dry	170.47	3.46 U	86	50-140	4	40
Acenaphthene	137	3.41	ug/kg dry	170.47	3.46 U	81	17-139	7	40
Fluorene	158	3.41	ug/kg dry	170.47	3.46 U	92	28-145	10	40
Phenanthrene	162	3.41	ug/kg dry	170.47	3.46 U	95	30-152	7	40
Anthracene	168	3.41	ug/kg dry	170.47	3.46 U	99	19-171	7	40
Fluoranthene	161	3.41	ug/kg dry	170.47	2.68	93	34-159	5	40
Indeno[1,2,3-cd]pyrene	158	3.41	ug/kg dry	170.47	1.99	92	31-156	10	40
Pyrene	157	3.41	ug/kg dry	170.47	3.46 U	92	33-152	4	40
Benz[a]anthracene	170	3.41	ug/kg dry	170.47	3.46 U	100	32-157	8	40
Chrysene	151	3.41	ug/kg dry	170.47	0.969	88	31-159	3	40
Benzo[b] fluoranthene	145	3.41	ug/kg dry	170.47	3.46 U	85	33-164	2	40
Benzo[k] fluoranthene	162	3.41	ug/kg dry	170.47	3.46 U	95	28-161	4	40
Benzo[a] pyrene	174	3.41	ug/kg dry	170.47	3.46 U	102	29-149	5	40
Dibenz[a,h]anthracene	163	3.41	ug/kg dry	170.47	3.46 U	96	27-153	5	40
Benzo[g,h,i] perylene	162	3.41	ug/kg dry	170.47	3.46 U	95	32-157	20	40
Surrogate: Triphenylene	*164*		*ug/kg dry*	*170.47*		*96*	*68-129*		

PREPARATION BENCH SHEET

L210086

Lionville Laboratory

Printed: 10/12/2012 2:18:42PM

000000075

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1200612

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210029-01	8310 PAH	10/11/2012 12:21	30.08	5				50	WC-Hanford, Inc.	
1210034-01	8310 PAH	10/11/2012 12:21	30.21	5				50	WC-Hanford, Inc.	
L210086-BLK1	QC	10/11/2012 12:21	30	5				50		
L210086-BS1	QC	10/11/2012 12:21	30	5	1200963		50	50		
L210086-MS1	QC	10/11/2012 12:21	30.32	5	1200963	1210029-01	50	50		
L210086-MS2	QC	10/11/2012 12:21	30.61	5	1200963	1210034-01	50	50		
L210086-MSD1	QC	10/11/2012 12:21	30.52	5	1200963	1210029-01	50	50		
L210086-MSD2	QC	10/11/2012 12:21	30.5	5	1200963	1210034-01	50	50		

1450

Extracts Relinquished By — Date: 10/12/12

Extracts Received By — Date: 10.15.12 7:15

HERBICIDES

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-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 20:32

Analytical Report for Chlorinated Herbicides by SW846 8151A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Client: WC-HANFORD RC-148 K3999
LVL #: 1210029

W.O. #: 60049-001-001-0001
Date Received: 10-10-2012

HERBICIDE

One (1) soil sample was collected on 10-09-2012.

The sample and its associated QC samples were extracted 10-11-2012 and analyzed 10-17-12 according to criteria set forth in Lionville Laboratory SOPs. The extraction and analysis procedures were based on SW846 Method 8151A.

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

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy 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. One (1) of sixteen (16) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12GC174) has been enclosed.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria. 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.
9. The sample is reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

10/27/12
Date

r:\group\data\2012\herbicides\wc hanford\1210029.doc

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

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12GC174

Initiator: Catherine Carey
Date: 10/24/12
Client: LOC Hanford

Batch: 1210029
Samples: MS2
Method: SW846/MCAWW/CLP/

Parameter: Herb
Matrix: SOIL
Prep Batch: L210078

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)

Dalapon Recovery low in MS2 (38%)

OK in MSD2 + BS1

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

Narrate
2D.

4. Project Manager Instructions...signature/date: 11/14/12

✓ 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: 11/14/12 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

8151A Herbicides
Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 10.17.12 10:50:80 AM		CCV2 10.17.12 5:29:06 pm		CCV3 10.17.12 8:29:55 pm		CCV4		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
DCAA (surrogate)						17.7										
2,4-D					21.2	16.7										
2,4-DB						20.6										
2,4,5-T					26.4	18.7										
2,4,5-TP (Silvex)	-18.9															
Dalapon																
Dicamba																
Dichloroprop																
Dinoseb		19.5		25.1		33.3										
Pentachlorophenol																
MCPA																
MCPP																
Mean %D or %Drift	-5.7	-1.2	1.8	8.7	9.0	14.0										

Sample results reported from affected CCV:

CCV1: L210078-BLK1, BS1, MS1, MSD1, MS3, MSD3, 1210012-01, 02, 1210034-01

CCV2: 1210029-01, L210078-MS2, MSD2

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 20:32

J1R2T9

1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Chlorinated Herbicides by SW846 8151A									
Dalapon	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
Dicamba	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
Dichloroprop	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
2,4-D	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
2,4,5-TP (Silvex)	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
2,4,5-T	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
Dinoseb	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
2,4-DB	34.6	U	34.6	ug/kg dry	1	L210078	10/11/2012	10/17/2012	8151A
Surrogate: DCAA	*81 %*		*25-130*			*L210078*	*10/11/2012*	*10/17/2012*	*8151A*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 20:32

Chlorinated Herbicides by SW846 8151A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210078 - SW 8151A										
Blank (L210078-BLK1)				Prepared: 10/11/2012 Analyzed: 10/17/2012						
Dalapon	33.3	U	33.3	ug/kg wet						
Dicamba	33.3	U	33.3	ug/kg wet						
Dichloroprop	33.3	U	33.3	ug/kg wet						
2,4-D	33.3	U	33.3	ug/kg wet						
2,4,5-TP (Silvex)	33.3	U	33.3	ug/kg wet						
2,4,5-T	33.3	U	33.3	ug/kg wet						
Dinoseb	33.3	U	33.3	ug/kg wet						
2,4-DB	33.3	U	33.3	ug/kg wet						
Surrogate: DCAA	*90.7*			*ug/kg wet*	*166.67*		*54*	*25-130*		
LCS (L210078-BS1)				Prepared: 10/11/2012 Analyzed: 10/17/2012						
Dalapon	105		33.3	ug/kg wet	166.67		63	40-120		
Dicamba	115		33.3	ug/kg wet	166.67		69	40-120		
Dichloroprop	113		33.3	ug/kg wet	166.67		68	40-120		
2,4-D	104		33.3	ug/kg wet	166.67		62	40-120		
2,4,5-TP (Silvex)	113		33.3	ug/kg wet	166.67		68	50-120		
2,4,5-T	105		33.3	ug/kg wet	166.67		63	60-120		
Dinoseb	49.0		33.3	ug/kg wet	166.67		29	5-120		
2,4-DB	122		33.3	ug/kg wet	166.67		73	40-120		
Surrogate: DCAA	*127*			*ug/kg wet*	*166.67*		*76*	*25-130*		
Matrix Spike (L210078-MS2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/17/2012						
Dalapon	64.9		34.3	ug/kg dry	171.42	34.6 U	38*	40-120		
Dicamba	126		34.3	ug/kg dry	171.42	34.6 U	73	40-120		
Dichloroprop	146		34.3	ug/kg dry	171.42	34.6 U	85	40-120		
2,4-D	137		34.3	ug/kg dry	171.42	34.6 U	80	40-120		
2,4,5-TP (Silvex)	142		34.3	ug/kg dry	171.42	34.6 U	83	50-120		
2,4,5-T	127		34.3	ug/kg dry	171.42	34.6 U	74	60-120		
Dinoseb	36.1		34.3	ug/kg dry	171.42	34.6 U	21	5-120		
2,4-DB	137		34.3	ug/kg dry	171.42	34.6 U	80	40-120		
Surrogate: DCAA	*136*			*ug/kg dry*	*171.42*		*79*	*25-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/24/2012 20:32

Chlorinated Herbicides by SW846 8151A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210078 - SW 8151A										
Matrix Spike Dup (L210078-MSD2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/17/2012						
Dalapon	82.0		33.7	ug/kg dry	168.92	34.6 U	49	40-120	25	40
Dicamba	131		33.7	ug/kg dry	168.92	34.6 U	78	40-120	5	40
Dichloroprop	150		33.7	ug/kg dry	168.92	34.6 U	89	40-120	4	40
2,4-D	158		33.7	ug/kg dry	168.92	34.6 U	94	40-120	15	40
2,4,5-TP (Silvex)	146		33.7	ug/kg dry	168.92	34.6 U	87	50-120	5	40
2,4,5-T	147		33.7	ug/kg dry	168.92	34.6 U	87	60-120	16	40
Dinoseb	8.72	J	33.7	ug/kg dry	168.92	34.6 U	5	5-120	121*	40
2,4-DB	146		33.7	ug/kg dry	168.92	34.6 U	87	40-120	8	40
Surrogate: DCAA	*121*			*ug/kg dry*	*168.92*		*71*	*25-130*		

PREPARATION BENCH SHEET

L210078

Lionville Laboratory

Printed: 10/16/2012 9:43:57PM

00000085

Matrix: Solid

Prepared using: GC - SW 8151A

Surrogate used: 1200605

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1210012-01	8151A Herbicides	10/11/2012 11:50	30.14	10				100	United Corrstack, LLC	
1210012-02	8151A Herbicides	10/11/2012 11:50	30.26	10				100	United Corrstack, LLC	
1210029-01	8151A Herbicides	10/11/2012 11:50	30	10				100	WC-Hanford, Inc.	
1210034-01	8151A Herbicides	10/11/2012 11:50	24.62	10				100	WC-Hanford, Inc.	
L210078-BLK1	QC	10/11/2012 11:50	30	10				100		
L210078-BS1	QC	10/11/2012 11:50	30	10	1200606		100	100		
L210078-MS1	QC	10/11/2012 11:50	30.65	10	1200606	1210012-02	100	100		
L210078-MS2	QC	10/11/2012 11:50	30.35	10	1200606	1210029-01	100	100		
L210078-MS3	QC	10/11/2012 11:50	24.36	10	1200606	1210034-01	100	100		
L210078-MSD1	QC	10/11/2012 11:50	30.63	10	1200606	1210012-02	100	100		
L210078-MSD2	QC	10/11/2012 11:50	30.8	10	1200606	1210029-01	100	100		
L210078-MSD3	QC	10/11/2012 11:50	24.15	10	1200606	1210034-01	100	100		

Extracts Relinquished By — Date: 10/16/12 2143

Extracts Received By — Date: 10/17/12 7:00

METALS

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-148
LVL#: 1210029
SDG/SAF#: K3999/RC-148

W.O.#: 60049-001-001-0001-00
Date Received: 10-10-12

METALS

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

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

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

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

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

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

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

10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% 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.

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, Iron, Antimony, and Silicon.

12. The duplicate analysis for 1 analyte was 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 Arsenic 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

10/19/12
Date

alm/10-029hg%

264 Welsh Pool Road
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

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

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-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

J1R2T9
1210029-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**5790**		14.2	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Antimony	1.70	U	1.70	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Arsenic	**3.49**		2.84	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Barium	**57.6**		1.42	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Beryllium	**0.253**	B	0.568	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Boron	5.68	U	5.68	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Cadmium	0.568	U	0.568	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Calcium	**5630**		284	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Chromium	**9.34**		0.568	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Cobalt	**5.53**	B	5.68	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Copper	**11.9**		2.84	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Iron	**19000**		56.8	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Lead	**3.77**		1.42	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Lithium	**7.19**		7.09	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Magnesium	**4160**		213	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Manganese	**282**		14.2	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Molybdenum	5.68	U	5.68	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Nickel	**10.9**	B	11.4	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Potassium	**1060**	B	1140	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Selenium	0.851	U	0.851	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Silicon	**754**		5.68	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Silver	0.568	U	0.568	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Sodium	**174**		142	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Uranium	56.8	U	56.8	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Vanadium	**49.3**		7.09	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Zinc	**36.4**		28.4	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Zirconium	**13.5**		7.09	mg/kg dry	3	L210094	10/12/2012	10/15/2012	6010B
Mercury	0.0240	U	0.0240	mg/kg dry	1	L210088	10/11/2012	10/12/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

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 L210088 - SW 7471A Prep										
Blank (L210088-BLK1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
Mercury	0.0281	U	0.0281	mg/kg wet						
Duplicate (L210088-DUP2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012						
Mercury	0.0246	U	0.0246	mg/kg dry		0.0240 U				20
Matrix Spike (L210088-MS2)		**Source: 1210029-01**		Prepared: 10/11/2012 Analyzed: 10/12/2012						
Mercury	0.157		0.0253	mg/kg dry	0.14061	0.0240 U	112	75-125		20
Reference (L210088-SRM1)				Prepared: 10/11/2012 Analyzed: 10/12/2012						
Mercury	1.34		0.0290	mg/kg wet	1.2900		104	62.6-138		
Batch L210094 - SW 3050B										
Blank (L210094-BLK1)				Prepared: 10/12/2012 Analyzed: 10/15/2012						
Aluminum	4.81	U	4.81	mg/kg wet						
Antimony	0.577	U	0.577	mg/kg wet						
Arsenic	0.962	U	0.962	mg/kg wet						
Barium	0.481	U	0.481	mg/kg wet						
Beryllium	0.192	U	0.192	mg/kg wet						
Boron	1.92	U	1.92	mg/kg wet						
Cadmium	0.192	U	0.192	mg/kg wet						
Calcium	96.2	U	96.2	mg/kg wet						
Chromium	0.192	U	0.192	mg/kg wet						
Cobalt	1.92	U	1.92	mg/kg wet						
Copper	0.962	U	0.962	mg/kg wet						
Iron	19.2	U	19.2	mg/kg wet						
Lead	0.481	U	0.481	mg/kg wet						
Lithium	2.40	U	2.40	mg/kg wet						
Magnesium	72.1	U	72.1	mg/kg wet						
Manganese	4.81	U	4.81	mg/kg wet						
Molybdenum	1.92	U	1.92	mg/kg wet						
Nickel	3.85	U	3.85	mg/kg wet						
Potassium	385	U	385	mg/kg wet						
Selenium	0.288	U	0.288	mg/kg wet						
Silicon	1.92	U	1.92	mg/kg wet						
Silver	0.192	U	0.192	mg/kg wet						
Sodium	48.1	U	48.1	mg/kg wet						
Uranium	19.2	U	19.2	mg/kg wet						
Vanadium	2.40	U	2.40	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

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 L210094 - SW 3050B										
Blank (L210094-BLK1)				Prepared: 10/12/2012 Analyzed: 10/15/2012						
Zinc	9.62	U	9.62	mg/kg wet						
Zirconium	2.40	U	2.40	mg/kg wet						
Duplicate (L210094-DUP1)		**Source: 1210029-01**		Prepared: 10/12/2012 Analyzed: 10/15/2012						
Aluminum	6010		14.5	mg/kg dry		5790			3.63	20
Antimony	1.73	U	1.73	mg/kg dry		1.70 U				20
Arsenic	2.33	B	2.89	mg/kg dry		3.49			40.0*	20
Barium	71.8		1.45	mg/kg dry		57.6			21.8*	20
Beryllium	0.245	B	0.578	mg/kg dry		0.253			3.00	20
Boron	5.78	U	5.78	mg/kg dry		5.68 U				20
Cadmium	0.578	U	0.578	mg/kg dry		0.568 U				20
Calcium	4990		289	mg/kg dry		5630			12.0	20
Chromium	8.10		0.578	mg/kg dry		9.34			14.3	20
Cobalt	5.23	B	5.78	mg/kg dry		5.53			5.51	20
Copper	9.97		2.89	mg/kg dry		11.9			17.7	20
Iron	18100		57.8	mg/kg dry		19000			4.63	20
Lead	3.69		1.45	mg/kg dry		3.77			2.15	20
Lithium	7.04	B	7.23	mg/kg dry		7.19			2.03	20
Magnesium	3770		217	mg/kg dry		4160			9.88	20
Manganese	299		14.5	mg/kg dry		282			5.89	20
Molybdenum	5.78	U	5.78	mg/kg dry		5.68 U				20
Nickel	8.46	B	11.6	mg/kg dry		10.9			25.3*	20
Potassium	1060	B	1160	mg/kg dry		1060			0.215	20
Selenium	0.867	U	0.867	mg/kg dry		0.851 U				20
Silicon	726		5.78	mg/kg dry		754			3.82	20
Silver	0.578	U	0.578	mg/kg dry		0.568 U				20
Sodium	183		145	mg/kg dry		174			5.14	20
Uranium	57.8	U	57.8	mg/kg dry		56.8 U				20
Vanadium	48.1		7.23	mg/kg dry		49.3			2.46	20
Zinc	35.8		28.9	mg/kg dry		36.4			1.73	20
Zirconium	14.1		7.23	mg/kg dry		13.5			4.84	20

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

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 L210094 - SW 3050B									
Matrix Spike (L210094-MS1)		**Source: 1210029-01**	Prepared: 10/12/2012 Analyzed: 10/15/2012						
Aluminum	7090	14.2	mg/kg dry	189.19	5790	688*	75-125		
Antimony	23.1	1.70	mg/kg dry	47.297	1.70 U	48.7*	75-125		
Arsenic	185	2.84	mg/kg dry	189.19	3.49	96.0	75-125		
Barium	251	1.42	mg/kg dry	189.19	57.6	102	75-125		
Beryllium	4.82	0.568	mg/kg dry	4.7297	0.253	96.5	75-125		
Boron	88.8	5.68	mg/kg dry	94.594	5.68 U	93.8	75-125		
Cadmium	4.43	0.568	mg/kg dry	4.7297	0.568 U	93.7	75-125		
Calcium	8240	284	mg/kg dry	2364.8	5630	111	75-125		
Chromium	27.4	0.568	mg/kg dry	18.919	9.34	95.3	75-125		
Cobalt	50.9	5.68	mg/kg dry	47.297	5.53	96.0	75-125		
Copper	34.5	2.84	mg/kg dry	23.648	11.9	95.6	75-125		
Iron	18900	56.8	mg/kg dry	94.594	19000	-111*	75-125		
Lead	47.4	1.42	mg/kg dry	47.297	3.77	92.2	75-125		
Lithium	98.2	7.09	mg/kg dry	94.594	7.19	96.2	75-125		
Magnesium	6030	213	mg/kg dry	2364.8	4160	79.3	75-125		
Manganese	335	14.2	mg/kg dry	47.297	282	113	75-125		
Molybdenum	88.3	5.68	mg/kg dry	94.594	5.68 U	93.4	75-125		
Nickel	55.1	11.4	mg/kg dry	47.297	10.9	93.5	75-125		
Potassium	3270	1140	mg/kg dry	2364.8	1060	93.3	75-125		
Selenium	178	0.851	mg/kg dry	189.19	0.851 U	93.9	75-125		
Silicon	908	5.68	mg/kg dry	94.594	754	163*	75-125		
Silver	4.42	0.568	mg/kg dry	4.7297	0.568 U	93.5	75-125		
Sodium	2550	142	mg/kg dry	2364.8	174	101	75-125		
Uranium	428	56.8	mg/kg dry	472.97	56.8 U	90.5	75-125		
Vanadium	98.5	7.09	mg/kg dry	47.297	49.3	104	75-125		
Zinc	82.8	28.4	mg/kg dry	47.297	36.4	98.0	75-125		
Zirconium	445	7.09	mg/kg dry	472.97	13.5	91.3	75-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/16/2012 14:08

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 L210094 - SW 3050B									
Post Spike (L210094-PS1)		**Source: 1210029-01**	Prepared: 10/12/2012 Analyzed: 10/15/2012						
Aluminum	113000		ug/L	60000	61200	86.8	75-125		
Antimony	290		ug/L	300.00	3.66	95.5	75-125		
Iron	302000		ug/L	126000	201000	80.6	75-125		
Silicon	11000		ug/L	3300.0	7970	92.5	75-125		
Reference (L210094-SRM1)			Prepared: 10/12/2012 Analyzed: 10/15/2012						
Aluminum	8110	13.9	mg/kg wet	6670.0		122	0-200.89		
Antimony	38.4	1.67	mg/kg wet	53.000		72.5	0-235.8		
Arsenic	118	2.78	mg/kg wet	114.00		103	82.8-117.54		
Barium	325	1.39	mg/kg wet	307.00		106	79.8-120.2		
Beryllium	105	0.556	mg/kg wet	108.00		97.6	82.8-117.6		
Boron	83.6	5.56	mg/kg wet	85.100		98.3	67.5-132.8		
Cadmium	224	0.556	mg/kg wet	225.00		99.6	83.6-116.4		
Calcium	3200	278	mg/kg wet	3360.0		95.2	83.3-116.9		
Chromium	78.2	0.556	mg/kg wet	77.200		101	73.3-126.4		
Cobalt	163	5.56	mg/kg wet	166.00		98.0	80.7-118.7		
Copper	274	2.78	mg/kg wet	271.00		101	80.8-119.2		
Iron	8390	55.6	mg/kg wet	8420.0		99.7	78.6-121.1		
Lead	183	1.39	mg/kg wet	190.00		96.2	81.6-118.4		
Lithium	119	6.94	mg/kg wet	114.00		104	50.9-148.2		
Magnesium	8260	208	mg/kg wet	8570.0		96.4	83.2-116.7		
Manganese	848	13.9	mg/kg wet	965.00		87.8	69.3-130.5		
Molybdenum	238	5.56	mg/kg wet	235.00		101	76.2-123.8		
Nickel	226	11.1	mg/kg wet	221.00		102	79.6-120.8		
Potassium	14400	1110	mg/kg wet	14400		100	81.9-118.1		
Selenium	191	0.833	mg/kg wet	187.00		102	75.9-124.6		
Silicon	1080	5.56	mg/kg wet	807.00		133	0-219.3		
Silver	80.6	0.556	mg/kg wet	83.500		96.5	82.7-117.1		
Sodium	9100	139	mg/kg wet	9730.0		93.6	82.5-117.2		
Vanadium	106	6.94	mg/kg wet	98.700		107	75.9-123.6		
Zinc	200	27.8	mg/kg wet	199.00		100	78.4-121.6		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L210094-
Date/Time Initiated: 10/12/12 1200
Date/Time Completed: 10/12/12 1830
Analyst: MW
Matrix (circle): Soil / Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: ✓ NA
Temp: 95°
BLOCK 1 2 (circle one)
B

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1210029-01		0.55	50			fine	brown/tan/sandy	rocks	
L210094-DUP1		0.54	50			↓	↓	↓	
-MS1	0.5	0.55	50			↓	↓	↓	
1210034-07		0.64	50			not fine	brown/sandy	rocks	
L210094-DUP2		0.62	50			↓	↓	↓	
-MS2	0.5	0.66	50			↓	↓	↓	
-BLK1		0.52	50			coarse	boiling drips	N/A	
-SRM1	✱	0.54	50			fine	pink/sandy	↓	

MW 10/12/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: 1201014 ✱

Reagent IDs:
HNO_3 L08023
HCl L13029
H_2O_2 L11A03
1:1 HNO_3 637-066-02
1:1 HCl

File ID#:

Data Review By/Date: CLM 10/15/12

✱ dbw 0.25 ml 1200380 (U-)
0.25 ml 1200386 (2)

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

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 10/11/12
Start Time/Temp: 1855/94°
End Time/Temp: 1935/94°

Instrument ID: HG3.3
Balance # B14 /NA
Pipette Calibration (Daily) (✓)

Logbook # 1153
Prep Batch: L210088
Worksheet: HG101203
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	
0.2ug/l		0.100		10ml	50	
1.0ug/l		0.500		10ml	50	
2.0ug/l		1.000		10ml	50	
5.0ug/l		2.500		10ml	50	
10.0ug/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L210088-BLK1				0.32	50	
SRM1		(✓)	(✓)	0.31	50	
1210012-01				0.31	50	
L210088-DUP1				0.33	50	
MS1		0.500	1.0	0.32	50	
1210012-02				0.37	50	
1210029-01				0.39	50	
L210088-DUP2				0.38	50	
MS2		0.500	1.0	0.37	50	
1210034-01				0.32	50	
L210088-DUP3				0.33	50	
MS3		0.500	1.0	0.35	50	

[illegible] 10/11/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1201178	10/11/12 1136
ICV/CCV/LCS	(IV. 1210532)	N/A

Reviewed By/Date: [illegible] 10/15/12

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
Soil LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

WET CHEMISTRY

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R2T9	1210029-01	Soil	10/09/2012 09:52	10/10/2012 09:45

LIONVILLE LABORATORY
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Case Narrative

Client: WC HANFORD SAF# RC-148
LVL#: 1210029

W.O.#:
Date Received: 10-10-2012

INORGANIC NARRATIVE

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

2. The sample was prepared and analyzed in accordance with the methods indicated on the data summary report. Results for soil or solid pH are measured in water at 25°C unless otherwise specified.

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

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

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy as 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 applicable control limits as noted in the Analytical Report.

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.

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 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

10/27/12
Date

mld/i10-029

Lionville Laboratory, PADEP Lab ID# 15-00009
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Exton, PA 19341
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

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

CYANIDE CALCULATIONS

Initial calibration data are to be entered into a computer program for least squares regression using the absorbance as Y values and target concentrations as X values. The program calculates an equation to describe the data having the general form:

$$Y = aX + b$$

where:

Y = absorbance
a = slope of the regression line
X = sample concentration
b = Y intercept (x = 0)

By substituting the sample absorbance (Y) into the equation, the sample concentration may be obtained.

Cyanide Concentration:

Water:

$$\text{CN } (\mu g/L) = X \frac{\text{(final sample volume, mL) x dilution factor}}{\text{(initial sample volume, mL)}}$$

Soil:

$$\text{CN } (mg/Kg) = X \frac{\text{(final sample volume, mL) x dilution factor}}{\text{(initial sample weight, g) x percent solids}}$$

where:

X = sample concentration

To calculate the cyanides amendable to chlorination the result from the pretreated sample is subtracted from the total cyanide result.

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R2T9 (1210029-01) Soil										
%Solids	**96.1**			0.1	% by Weight	1	L210091	10/12/2012 11:07	10/12/2012 11:07	SM2540G
Bromide	0.9	U	0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Chloride	**1.2**	B	0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Fluoride	0.9	U	0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Nitrate	**7.0**		0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Nitrite	0.9	U	0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Orthophosphate	1.9	U	1.9	9.4	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Sulfate	**43.2**		0.9	4.7	mg/kg dry	1	L210146	10/17/2012 07:40	10/17/2012 12:36	EPA 300.0 (1993)
Nitrate/Nitrite as N	**1.60**		0.09	0.47	mg/kg dry	1	L210147	10/17/2012 07:40	10/18/2012 09:38	EPA 353.2
Hexavalent Chromium	0.21	U	0.21	0.52	mg/kg dry	1	L210110	10/17/2012 10:20	10/18/2012 15:25	SW846 7196A
Cyanide	0.52	U	0.52	1.03	mg/kg dry	1	L210170	10/22/2012 13:30	10/23/2012 13:08	SW846 9014
Sulfide	41.6	U	41.6	104	mg/kg dry	1	L210143	10/16/2012 13:25	10/16/2012 15:40	SW846 9034
pH	**8.45**		0.10	0.10	pH Units	1	L210115	10/15/2012 11:00	10/15/2012 12:59	SW846 9045D

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

Wet Chemistry - Quality Control
Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210091 - % Solids										
Duplicate (L210091-DUP1)	**Source: 1210029-01**			Prepared & Analyzed: 10/12/2012 11:07						
%Solids	96.1		0.1	% by Weight		96.1			0.06	20
Batch L210110 - Default Prep GenChem										
Blank (L210110-BLK1)				Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	0.20 U	0.20	0.50	mg/kg wet						
LCS (L210110-BS1)				Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	3.91	0.20	0.50	mg/kg wet	4.0000		98	80-120		
LCS (L210110-BS2)				Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	1120 D	20.0	50.0	mg/kg wet	1242.9		90	80-120		
Duplicate (L210110-DUP1)	**Source: 1210029-01**			Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	0.21 U	0.21	0.52	mg/kg dry		0.21 U				20
Matrix Spike (L210110-MS1)	**Source: 1210029-01**			Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	3.93	0.21	0.52	mg/kg dry	4.1621	0.21 U	94	75-125		
Matrix Spike (L210110-MS2)	**Source: 1210029-01**			Prepared: 10/17/2012 10:20 Analyzed: 10/18/2012 15:25						
Hexavalent Chromium	902 D	20.8	52.0	mg/kg dry	1058.8	0.21 U	85	75-125		
Batch L210115 - Default Prep GenChem										
Duplicate (L210115-DUP1)	**Source: 1210029-01**			Prepared: 10/15/2012 11:00 Analyzed: 10/15/2012 13:02						
pH	8.45	0.10	0.10	pH Units		8.45			0.00	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210115 - Default Prep GenChem										
Reference (L210115-SRM1)				Prepared & Analyzed: 10/15/2012 13:13						
pH	7.00	0.10	0.10	pH Units	7.0000		100	99-101		
Batch L210143 - SW 9030B										
Blank (L210143-BLK1)				Prepared: 10/16/2012 11:20 Analyzed: 10/16/2012 15:40						
Sulfide	40.0 U	40.0	100	mg/kg wet						
LCS (L210143-BS1)				Prepared: 10/16/2012 11:20 Analyzed: 10/16/2012 15:40						
Sulfide	251	40.0	100	mg/kg wet	249.78		100	80-120		
LCS (L210143-BS2)				Prepared: 10/16/2012 11:20 Analyzed: 10/16/2012 15:40						
Sulfide	238	40.0	100	mg/kg wet	245.00		97.1	80-120		
Duplicate (L210143-DUP1)	**Source: 1210029-01**			Prepared: 10/16/2012 13:25 Analyzed: 10/16/2012 15:40						
Sulfide	41.6 U	41.6	104	mg/kg dry		41.6 U				20
Matrix Spike (L210143-MS1)	**Source: 1210029-01**			Prepared: 10/16/2012 13:25 Analyzed: 10/16/2012 15:40						
Sulfide	250	41.6	104	mg/kg dry	253.29	41.6 U	98.7	75-125		
Batch L210146 - Default Prep GenChem										
Blank (L210146-BLK1)				Prepared: 10/17/2012 07:40 Analyzed: 10/17/2012 12:36						
Fluoride	1.0 U	1.0	4.9	mg/kg wet						
Chloride	1.0 U	1.0	4.9	mg/kg wet						
Bromide	1.0 U	1.0	4.9	mg/kg wet						
Orthophosphate	2.0 U	2.0	9.8	mg/kg wet						
Sulfate	1.0 U	1.0	4.9	mg/kg wet						
Nitrate	2.3 B	1.0	4.9	mg/kg wet						
Nitrite	1.0 U	1.0	4.9	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-148	
2620 Fermi Avenue	Project Number: K3999	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2012 13:02

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210146 - Default Prep GenChem										
LCS (L210146-BS1)				Prepared: 10/17/2012 07:40 Analyzed: 10/17/2012 12:36						
Fluoride	50.1	1.0	5.0	mg/kg wet	49.900		100	80-120		
Chloride	46.0	1.0	5.0	mg/kg wet	49.900		92.2	80-120		
Bromide	47.0	1.0	5.0	mg/kg wet	49.900		94.2	80-120		
Orthophosphate	48.2	2.0	10.0	mg/kg wet	49.900		96.6	80-120		
Sulfate	48.1	1.0	5.0	mg/kg wet	49.900		96.4	80-120		
Nitrate	46.3	1.0	5.0	mg/kg wet	49.900		92.8	80-120		
Nitrite	47.4	1.0	5.0	mg/kg wet	49.900		95.0	80-120		
Duplicate (L210146-DUP1)		Source: 1210029-01		Prepared: 10/17/2012 07:40 Analyzed: 10/17/2012 12:36						
Fluoride	1.0 U	1.0	5.1	mg/kg dry		0.9 U				20
Chloride	1.2 B	1.0	5.1	mg/kg dry		1.2			0.549	20
Bromide	1.0 U	1.0	5.1	mg/kg dry		0.9 U				20
Orthophosphate	2.0 U	2.0	10.2	mg/kg dry		1.9 U				20
Sulfate	39.3	1.0	5.1	mg/kg dry		43.2			9.54	20
Nitrate	6.8	1.0	5.1	mg/kg dry		7.0			2.89	20
Nitrite	1.0 U	1.0	5.1	mg/kg dry		0.9 U				20
Matrix Spike (L210146-MS1)		Source: 1210029-01		Prepared: 10/17/2012 07:40 Analyzed: 10/17/2012 12:36						
Fluoride	49.8	1.0	4.9	mg/kg dry	48.866	0.9 U	102	75-125		
Chloride	47.2	1.0	4.9	mg/kg dry	48.866	1.2	94.1	75-125		
Bromide	46.3	1.0	4.9	mg/kg dry	48.866	0.9 U	94.8	75-125		
Orthophosphate	48.1	2.0	9.8	mg/kg dry	48.866	1.9 U	98.4	75-125		
Sulfate	84.7	1.0	4.9	mg/kg dry	48.866	43.2	85.0	75-125		
Nitrate	54.2	1.0	4.9	mg/kg dry	48.866	7.0	96.8	75-125		
Nitrite	46.7	1.0	4.9	mg/kg dry	48.866	0.9 U	95.6	75-125		
Batch L210147 - Default Prep GenChem										
Blank (L210147-BLK1)				Prepared: 10/17/2012 07:40 Analyzed: 10/18/2012 09:36						
Nitrate/Nitrite as N	0.10 U	0.10	0.49	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-148 Project Number: K3999 Project Manager: Joan Kessner	**Reported:** 10/27/2012 13:02

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L210147 - Default Prep GenChem										
LCS (L210147-BS1)				Prepared: 10/17/2012 07:40 Analyzed: 10/18/2012 09:35						
Nitrate/Nitrite as N	4.77	0.10	0.50	mg/kg wet	4.9900		95.6	90-110		
Duplicate (L210147-DUP1)	**Source: 1210029-01**			Prepared: 10/17/2012 07:40 Analyzed: 10/18/2012 09:39						
Nitrate/Nitrite as N	1.69	0.10	0.51	mg/kg dry		1.60			5.57	20
Matrix Spike (L210147-MS1)	**Source: 1210029-01**			Prepared: 10/17/2012 07:40 Analyzed: 10/18/2012 09:40						
Nitrate/Nitrite as N	7.18	0.10	0.49	mg/kg dry	4.8866	1.60	114	75-125		
Batch L210170 - Default Prep GenChem										
Blank (L210170-BLK1)				Prepared: 10/22/2012 13:30 Analyzed: 10/23/2012 13:05						
Cyanide	0.50 U	0.50	0.99	mg/kg wet						
LCS (L210170-BS1)				Prepared: 10/22/2012 13:30 Analyzed: 10/23/2012 13:06						
Cyanide	1.99	0.50	0.99	mg/kg wet	1.9897		100	80-120		
LCS (L210170-BS2)				Prepared: 10/22/2012 13:30 Analyzed: 10/23/2012 13:07						
Cyanide	9.56	0.50	1.00	mg/kg wet	9.9661		95.9	80-120		
Duplicate (L210170-DUP1)	**Source: 1210029-01**			Prepared: 10/22/2012 13:30 Analyzed: 10/23/2012 13:09						
Cyanide	0.52 U	0.52	1.04	mg/kg dry		0.52 U				20
Matrix Spike (L210170-MS1)	**Source: 1210029-01**			Prepared: 10/22/2012 16:05 Analyzed: 10/23/2012 13:11						
Cyanide	4.64	0.52	1.04	mg/kg dry	5.1819	0.52 U	89.6	75-125		

Eberline Analytical

e-mail

To: Joan Kessner

From: Joe Verville

Date: October 19, 2012

Re: SDG K3999, Priority

Hello Joan,

Attached is the priority report for K3999, RC-148.

JV

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

SDG 7020
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3999

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S210017-01	J1R2T9			7020-001	C		10/13/12	10/16/12	BW	Carbon 14 in Solids
10/09/12	308 Ramp Composite #1		SOIL	7020-001	GAM		10/11/12	10/12/12	CSS	Gamma Scan
10/10/12	RC-148-056	RC-148		7020-001	H		10/12/12	10/16/12	BW	Tritium in Solids
				7020-001	NI_L		10/17/12	10/18/12	BW	Nickel 63 in Solids
				7020-001	PU		10/17/12	10/17/12	BW	Plutonium, Isotopic in Solids
				7020-001	PU_L		10/17/12	10/18/12	BW	Plutonium 241 in Solids
				7020-001	SR		10/15/12	10/18/12	BW	Total Strontium in Solids
				7020-001	TC		10/16/12	10/16/12	BW	Technetium 99 in Solids
				7020-001	TH		10/16/12	10/16/12	BW	Thorium, Isotopic in Solids
				7020-001	TP		10/17/12	10/17/12	BW	Americium 241/Curium in Solids
				7020-001	U		10/16/12	10/16/12	BW	Uranium, Isotopic in Solids
				7020-001	U_T		10/15/12	10/15/12	BW	Uranium, Total in Solids
S210017-02	Lab Control Sample			7020-002	C		10/13/12	10/16/12	BW	Carbon 14 in Solids
			SOIL	7020-002	GAM		10/11/12	10/12/12	CSS	Gamma Scan
		RC-148		7020-002	H		10/13/12	10/16/12	BW	Tritium in Solids
				7020-002	NI_L		10/17/12	10/18/12	BW	Nickel 63 in Solids
				7020-002	PU		10/17/12	10/17/12	BW	Plutonium, Isotopic in Solids
				7020-002	PU_L		10/18/12	10/18/12	BW	Plutonium 241 in Solids
				7020-002	SR		10/15/12	10/18/12	BW	Total Strontium in Solids
				7020-002	TC		10/15/12	10/16/12	BW	Technetium 99 in Solids
				7020-002	TH		10/16/12	10/16/12	BW	Thorium, Isotopic in Solids
				7020-002	TP		10/17/12	10/17/12	BW	Americium 241/Curium in Solids
				7020-002	U		10/16/12	10/16/12	BW	Uranium, Isotopic in Solids
				7020-002	U_T		10/15/12	10/15/12	BW	Uranium, Total in Solids
S210017-03	Method Blank			7020-003	C		10/13/12	10/16/12	BW	Carbon 14 in Solids
			SOIL	7020-003	GAM		10/11/12	10/12/12	CSS	Gamma Scan
		RC-148		7020-003	H		10/12/12	10/16/12	BW	Tritium in Solids
				7020-003	NI_L		10/17/12	10/18/12	BW	Nickel 63 in Solids
				7020-003	PU		10/17/12	10/17/12	BW	Plutonium, Isotopic in Solids
				7020-003	PU_L		10/18/12	10/18/12	BW	Plutonium 241 in Solids
				7020-003	SR		10/15/12	10/18/12	BW	Total Strontium in Solids
				7020-003	TC		10/16/12	10/16/12	BW	Technetium 99 in Solids
				7020-003	TH		10/16/12	10/16/12	BW	Thorium, Isotopic in Solids
				7020-003	TP		10/17/12	10/17/12	BW	Americium 241/Curium in Solids
				7020-003	U		10/16/12	10/16/12	BW	Uranium, Isotopic in Solids
				7020-003	U_T		10/15/12	10/15/12	BW	Uranium, Total in Solids

Lab id EBRLNE
Protocol RC-148
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

SDG 7020
Contact Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG K3999

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S210017-04	Duplicate (S210017-01)			7020-004	C		10/13/12	10/16/12	BW	Carbon 14 in Solids
10/09/12	308 Ramp Composite #1		SOIL	7020-004	GAM		10/11/12	10/12/12	CSS	Gamma Scan
10/10/12		RC-148		7020-004	H		10/12/12	10/16/12	BW	Tritium in Solids
				7020-004	NI_L		10/17/12	10/18/12	BW	Nickel 63 in Solids
				7020-004	PU		10/17/12	10/17/12	BW	Plutonium, Isotopic in Solids
				7020-004	PU_L		10/18/12	10/18/12	BW	Plutonium 241 in Solids
				7020-004	SR		10/15/12	10/18/12	BW	Total Strontium in Solids
				7020-004	TC		10/16/12	10/16/12	BW	Technetium 99 in Solids
				7020-004	TH		10/16/12	10/16/12	BW	Thorium, Isotopic in Solids
				7020-004	TP		10/17/12	10/17/12	BW	Americium 241/Curium in Solids
				7020-004	U		10/16/12	10/16/12	BW	Uranium, Isotopic in Solids
				7020-004	U_T		10/15/12	10/15/12	BW	Uranium, Total in Solids

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	RC-148	Carbon 14 in Solids	C14LL_COX_LSC	1			1	1	1	4
GAM	RC-148	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	RC-148	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1	4
NI_L	RC-148	Nickel 63 in Solids	NI63_LSC	1			1	1	1	4
PU	RC-148	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
PU_L	RC-148	Plutonium 241 in Solids	PU241_IE_LSC	1			1	1	1	4
SR	RC-148	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	RC-148	Technetium 99 in Solids	TC99_TR_SEP_GPC	1			1	1	1	4
TH	RC-148	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	RC-148	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U	RC-148	Uranium, Isotopic in Solids	UISO_PLATE_AEA	1			1	1	1	4
U_T	RC-148	Uranium, Total in Solids	UTOT_KPA	1			1	1	1	4
TOTALS				12			12	12	12	48

Lab id EBRLNE
Protocol RC-148
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-003 Method Blank

METHOD BLANK

SDG	7020	Client/Case no	Hanford SDG_K3999
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S210017-03	Client sample id	Method Blank
Dept sample id	7020-003	Material/Matrix	SOIL
		SAF No	RC-148

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.226	0.96	1.61	400	U	H
Carbon 14	14762-75-5	0.360	0.57	0.943	1.00	U	C
Nickel 63	13981-37-8	0.907	1.6	2.70	30.0	U	NI_L
Total Strontium	SR-RAD	-0.002	0.14	0.284	1.00	U	SR
Americium 241	14596-10-2	0	0.058	0.221	1.00	U	TP
Curium 242	15510-73-3	0	0.058	0.221	1.00	U	TP
Curium 243/244	CM-243/244	-0.029	0.058	0.221	1.00	U	TP
Technetium 99	14133-76-7	0.085	0.25	0.618	15.0	U	TC
Thorium 228	14274-82-9	0.174	0.17	0.222	1.00	U	TH
Thorium 230	14269-63-7	-0.087	0.29	0.573	1.00	U	TH
Thorium 232	TH-232	0	0.058	0.222	1.00	U	TH
Uranium 233/234	U-233/234	0	0.062	0.238	1.00	U	U
Uranium 235	15117-96-1	0	0.075	0.288	1.00	U	U
Uranium 238	U-238	0	0.062	0.238	1.00	U	U
Plutonium 238	13981-16-3	-0.074	0.15	0.565	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.15	0.565	1.00	U	PU
Plutonium 241	14119-32-5	-0.888	9.0	15.1	15.0	U	PU_L
Total Uranium (ug/g)	7440-61-1	0	0.005	0.012	1.00	U	U_T
Potassium 40	13966-00-2	U		0.100		U	GAM
Cobalt 60	10198-40-0	U		0.009	0.050	U	GAM
Zinc 65	13982-39-3	U		0.017		U	GAM
Niobium 94	14681-63-1	U		0.009		U	GAM
Ruthenium 106	13967-48-1	U		0.076		U	GAM
Antimony 125	14234-35-6	U		0.022		U	GAM
Cesium 134	13967-70-9	U		0.010		U	GAM
Cesium 137	10045-97-3	U		0.008	0.100	U	GAM
Cerium 144	14762-78-8	U		0.043		U	GAM
Europium 152	14683-23-9	U		0.025	0.100	U	GAM
Europium 154	15585-10-1	U		0.019	0.100	U	GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-003 Method Blank

BLANK, cont.

SDG	7020	Client/Case no	Hanford	SDG K3999	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S210017-03	Client sample id	Method Blank		
Dept sample id	7020-003	Material/Matrix		SOIL	
		SAF No	RC-148		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Europium 155	14391-16-3	U		0.021	0.100	U	GAM
Radium 226	13982-63-3	U		0.020	0.100	U	GAM
Radium 228	15262-20-1	U		0.038	0.200	U	GAM
Thorium 228	14274-82-9	U		0.013		U	GAM
Thorium 232	TH-232	U		0.038		U	GAM
Bismuth 214	14733-03-0	U		0.020		U	GAM
Uranium 235	15117-96-1	U		0.045	0.300	U	GAM
Uranium 238	U-238	U		1.01	10.0	U	GAM
Americium 241	14596-10-2	U		0.013	0.300	U	GAM

QC-BLANK #82709

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7020

Contact Joseph Verville

Client/Case no Hanford SDG K3999

Contract No. S00W235A01

Lab sample id S210017-02

Dept sample id 7020-002

Client sample id Lab Control Sample

Material/Matrix SOIL

SAF No RC-148

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	312	4.8	1.85	400		H	320	13	98	84-116	80-120
Carbon 14	1040	21	5.04	1.00		C	1060	42	98	84-116	80-120
Nickel 63	250	6.4	2.77	30.0		NI_L	258	10	97	82-118	80-120
Total Strontium	8.02	0.41	0.194	1.00		SR	8.40	0.34	95	82-118	80-120
Americium 241	13.6	1.8	0.280	1.00		TP	12.1	0.48	112	73-127	80-120
Curium 243/244	10.1	1.5	0.280	1.00		TP	10.4	0.42	97	75-125	80-120
Technetium 99	134	3.0	0.635	15.0		TC	120	4.8	112	77-123	80-120
Thorium 230	18.7	2.0	0.550	1.00		TH	22.7	0.91	82	82-118	80-120
Uranium 233/234	10.3	1.4	0.261	1.00		U	11.8	0.47	87	78-122	80-120
Uranium 238	12.0	1.5	0.261	1.00		U	11.8	0.47	102	77-123	80-120
Plutonium 238	11.9	2.5	0.738	1.00		PU	13.6	0.54	88	70-130	80-120
Plutonium 239/240	14.0	2.7	0.738	1.00		PU	15.8	0.63	89	72-128	80-120
Plutonium 241	253	16	19.3	15.0		PU_L	296	12	85	81-119	80-120
Total Uranium (ug/g)	36.6	4.2	0.118	1.00		U_T	36.2	1.4	101	82-118	80-120
Cobalt 60	0.239	0.041	0.028	0.050		GAM	0.254	0.010	94	73-127	80-120
Cesium 137	0.293	0.036	0.024	0.100		GAM	0.302	0.012	97	79-121	80-120

QC-LCS #82708

Lab id EBRLNE

Protocol RC-148

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-004 J1R2T9

DUPLICATE

SDG	7020			Client/Case no	Hanford SDG K3999
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S210017-04	Lab sample id	S210017-01	Client sample id	J1R2T9
Dept sample id	7020-004	Dept sample id	7020-001	Location/Matrix	308 Ramp Composite #1 SOIL
		Received	10/10/12	Collected/Weight	10/09/12 09:52 1695 g
% solids	95.7	% solids	95.7	Custody/SAF No	RC-148-056 RC-148

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	0.135	0.89	1.50	400	U	H	-0.031	0.91	1.55	U	-		0.3
Carbon 14	1.30	0.56	0.896	1.00		C	1.09	0.54	0.877		18	100	0.5
Nickel 63	1.54	1.8	2.98	30.0	U	NI_L	1.65	1.8	2.88	U	-		0.1
Total Strontium	0.093	0.18	0.312	1.00	U	SR	-0.055	0.11	0.234	U	-		1.4
Americium 241	0.035	0.069	0.264	1.00	U	TP	0.054	0.11	0.205	U	-		0.3
Curium 242	0	0.072	0.274	1.00	U	TP	0	0.055	0.212	U	-		0
Curium 243/244	0.104	0.14	0.265	1.00	U	TP	0.080	0.11	0.205	U	-		0.3
Technetium 99	-0.123	0.16	0.597	15.0	U	TC	0.002	0.23	0.659	U	-		0.9
Thorium 228	0.573	0.32	0.305	1.00		TH	0.615	0.30	0.281		7	112	0.2
Thorium 230	0.159	0.38	0.608	1.00	U	TH	0.234	0.35	0.579	U	-		0.3
Thorium 232	0.827	0.32	0.243	1.00		TH	0.556	0.24	0.224		39	88	1.3
Uranium 233/234	0.530	0.24	0.225	1.00		U	0.487	0.23	0.219		8	100	0.3
Uranium 235	0	0.071	0.273	1.00	U	U	0.139	0.14	0.266	U	-		1.8
Uranium 238	0.530	0.24	0.225	1.00		U	0.430	0.23	0.219		21	105	0.6
Plutonium 238	-0.083	0.17	0.637	1.00	U	PU	0.097	0.19	0.742	U	-		1.4
Plutonium 239/240	0	0.17	0.637	1.00	U	PU	0	0.19	0.741	U	-		0
Plutonium 241	2.37	11	18.2	15.0	U	PU_L	6.44	11	18.6	U	-		0.5
Total Uranium (ug/g)	1.41	0.17	0.172	1.00		U_T	1.47	0.18	0.118		4	26	0.5
Potassium 40	14.6	0.51	0.191			GAM	14.9	0.51	0.175		2	17	0.4
Cobalt 60	U		0.022	0.050	U	GAM	U		0.017	U	-		0.4
Zinc 65	U		0.057		U	GAM	U		0.044	U	-		0.4
Niobium 94	U		0.017		U	GAM	U		0.017	U	-		0
Ruthenium 106	U		0.162		U	GAM	U		0.144	U	-		0.2
Antimony 125	U		0.046		U	GAM	U		0.042	U	-		0.1
Cesium 134	U		0.030		U	GAM	U		0.033	U	-		0.1
Cesium 137	U		0.020	0.100	U	GAM	U		0.018	U	-		0.1
Cerium 144	U		0.111		U	GAM	U		0.127	U	-		0.2
Europium 152	U		0.054	0.100	U	GAM	U		0.056	U	-		0.1

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

DUPLICATE, cont.

SDG	7020			Client/Case no	Hanford SDG K3999
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S210017-04	Lab sample id	S210017-01	Client sample id	J1R2T9
Dept sample id	7020-004	Dept sample id	7020-001	Location/Matrix	308 Ramp Composite #1 SOIL
		Received	10/10/12	Collected/Weight	10/09/12 09:52 1695 g
% solids	95.7	% solids	95.7	Custody/SAF No	RC-148-056 RC-148

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Europium 154	U		0.071	0.100	U	GAM	U		0.069	U	-		0
Europium 155	U		0.068	0.100	U	GAM	U		0.072	U	-		0.1
Radium 226	0.389	0.045	0.044	0.100		GAM	0.400	0.042	0.040		3	28	0.3
Radium 228	0.649	0.091	0.086	0.200		GAM	0.635	0.084	0.080		2	33	0.2
Thorium 228	0.778	0.046	0.042			GAM	0.644	0.032	0.028		19	19	3.0
Thorium 232	0.649	0.091	0.086			GAM	0.635	0.084	0.080		2	33	0.2
Bismuth 214	0.400	0.047	0.045			GAM	0.412	0.044	0.041		3	28	0.3
Uranium 235	U		0.123	0.300	U	GAM	U		0.140	U	-		0.2
Uranium 238	U		2.47	10.0	U	GAM	U		2.34	U	-		0.1
Americium 241	U		0.128	0.300	U	GAM	U		0.093	U	-		0.4

QC-DUP#1 82710

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-001 J1R2T9

DATA SHEET

SDG	7020	Client/Case no	Hanford SDG_K3999
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S210017-01	Client sample id	J1R2T9
Dept sample id	7020-001	Location/Matrix	308 Ramp Composite #1 SOIL
Received	10/10/12	Collected/Weight	10/09/12 09:52 1695 g
% solids	95.7	Custody/SAF No	RC-148-056 RC-148

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.031	0.91	1.55	400	U	H
Carbon 14	14762-75-5	1.09	0.54	0.877	1.00		C
Nickel 63	13981-37-8	1.65	1.8	2.88	30.0	U	NI_L
Total Strontium	SR-RAD	-0.055	0.11	0.234	1.00	U	SR
Americium 241	14596-10-2	0.054	0.11	0.205	1.00	U	TP
Curium 242	15510-73-3	0	0.055	0.212	1.00	U	TP
Curium 243/244	CM-243/244	0.080	0.11	0.205	1.00	U	TP
Technetium 99	14133-76-7	0.002	0.23	0.659	15.0	U	TC
Thorium 228	14274-82-9	0.615	0.30	0.281	1.00		TH
Thorium 230	14269-63-7	0.234	0.35	0.579	1.00	U	TH
Thorium 232	TH-232	0.556	0.24	0.224	1.00		TH
Uranium 233/234	U-233/234	0.487	0.23	0.219	1.00		U
Uranium 235	15117-96-1	0.139	0.14	0.266	1.00	U	U
Uranium 238	U-238	0.430	0.23	0.219	1.00		U
Plutonium 238	13981-16-3	0.097	0.19	0.742	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.19	0.741	1.00	U	PU
Plutonium 241	14119-32-5	6.44	11	18.6	15.0	U	PU_L
Total Uranium (ug/g)	7440-61-1	1.47	0.18	0.118	1.00		U_T
Potassium 40	13966-00-2	14.9	0.51	0.175			GAM
Cobalt 60	10198-40-0	U		0.017	0.050	U	GAM
Zinc 65	13982-39-3	U		0.044		U	GAM
Niobium 94	14681-63-1	U		0.017		U	GAM
Ruthenium 106	13967-48-1	U		0.144		U	GAM
Antimony 125	14234-35-6	U		0.042		U	GAM
Cesium 134	13967-70-9	U		0.033		U	GAM
Cesium 137	10045-97-3	U		0.018	0.100	U	GAM
Cerium 144	14762-78-8	U		0.127		U	GAM
Europium 152	14683-23-9	U		0.056	0.100	U	GAM

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/19/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3999

7020-001 J1R2T9

DATA SHEET, cont

SDG	7020	Client/Case no	Hanford	SDG_K3999	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S210017-01	Client sample id	J1R2T9		
Dept sample id	7020-001	Location/Matrix	308 Ramp Composite #1	SOIL	
Received	10/10/12	Collected/Weight	10/09/12 09:52	1695 g	
% solids	95.7	Custody/SAF No	RC-148-056	RC-148	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Europium 154	15585-10-1	U		0.069	0.100	U	GAM
Europium 155	14391-16-3	U		0.072	0.100	U	GAM
Radium 226	13982-63-3	0.400	0.042	0.040	0.100		GAM
Radium 228	15262-20-1	0.635	0.084	0.080	0.200		GAM
Thorium 228	14274-82-9	0.644	0.032	0.028			GAM
Thorium 232	TH-232	0.635	0.084	0.080			GAM
Bismuth 214	14733-03-0	0.412	0.044	0.041			GAM
Uranium 235	15117-96-1	U		0.140	0.300	U	GAM
Uranium 238	U-238	U		2.34	10.0	U	GAM
Americium 241	14596-10-2	U		0.093	0.300	U	GAM

300 Area D4 Waste Sites-Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-148
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/19/12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page ~~2 of 3~~ TRE 10-9-12

Collector M. Simonds	Company Contact Tom Edmundson	Telephone No. TRE 10-9-12 509-~~967-5673~~ 947-5192	Project Coordinator KESSNER, JH	Price Code 8L	Data Turnaround 21 Days
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 308 Ramp Composite #1 K3999 (7020)		SAF No. RC-148		
Ice Chest No. WCH-12-025	Field Logbook No. EL-1518-26	COA R308A0J453	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES / LIONVILLE	Offsite Property No. A110558		Bill of Lading/Air Bill No. See OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive <DOT Limits

Special Handling and/or Storage

~~Cool 4C~~
SMS 10/9/12

Preservation	Cool 4C	Cool 4C	None	None	None	None	None	None	None	None
Type of Container	aG	aG	G/P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	120mL	120mL	500ml	60mL	60mL	60mL	60mL	60mL	60mL	60mL
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	See item (1) in Special Instructions.	Isotopic Uranium	Isotopic Plutonium	Isotopic Thorium	Americium-241/Curium-244	Strontium-89,90 -- Total Sr	Technetium-99	Total Uranium
Sample No. / Matrix * / Sample Date / Sample Time	TRE 10-9-12									
J1R2T9 / SOIL / 10-9-12 / 0952			✓	✓	✓	✓	✓	✓	✓	✓

RC 344

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From LVI Miranda Simonds — Date/Time 10/9/12 1105	Received By/Stored In WCH SM Sexton — Date/Time 10/9/12 1105
Relinquished By/Removed From SM Sexton — Date/Time 10/9/12 1130	Received By/Stored In A. Freier — Date/Time 10-9-12 1130
Relinquished By/Removed From Fed Ex — Date/Time	Received By/Stored In 10-9-12 CMB — Date/Time
Relinquished By/Removed From WCH A. Freier — Date/Time 10-9-12 1235	Received By/Stored In Fed EX — Date/Time
Relinquished By/Removed From Fed EX — Date/Time	Received By/Stored In TE-Ruth Thurman — Date/Time 10/10/12 0930
Relinquished By/Removed From — Date/Time	Received By/Stored In — Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228, Ruthenium-106, Uranium-235, Uranium-238, Zinc-65}

REVIEWED BY CMB DATE 10-9-12

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-148-056	Page ~~3~~ of ~~3~~ TRE 10-9-12

Collector M. Simonds	Company Contact Tom Edmundson	Telephone No. TRE 10-9-12 509-~~967-5673~~ 947-5192	Project Coordinator KESSNER, JH
Price Code **8L**	Data Turnaround **21 Days**		
Project Designation 300 Area D4 Waste Sites - Soil Full Protocol	Sampling Location 308 Ramp Composite #1 K3999 (7020)		SAF No. RC-148
Ice Chest No. WCH-12-025	Field Logbook No. EL-1518-26	COA R308A0J453	Method of Shipment Fed Ex
~~Shipped To~~ EBERLINE SERVICES / LIONVILLE	Offsite Property No. A110558		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive <DOT Limits

Special Handling and/or Storage

~~Cool 4C~~
SMS 10/9/12

Preservation	None	None	None	None								
Type of Container	G/P	G/P	G/P	G/P								
No. of Container(s)	1	1	1	1								
Volume	60mL	60mL	60mL	60mL								
SAMPLE ANALYSIS	Plutonium-241	Carbon-14 Low Level	Tritium - H3	Nickel-63								
Sample No. / Matrix * / Sample Date / Sample Time												RCF
J1R2T9 / SOIL / 10-9-12 / 0952	✓	✓	✓	✓								34401

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From LVI Date/Time MICAH DA SILVA 10/9/12 1105	Received By/Stored In WCH Date/Time 1105 SM SEXTON 10/9/12	
Relinquished By/Removed From Date/Time 1130 SM SEXTON 10/9/12	Received By/Stored In Date/Time A. Freier 10-9-12 1130	
Relinquished By/Removed From Date/Time ~~Fed Ex~~	Received By/Stored In 10-9-12 Date/Time CMB	
Relinquished By/Removed From WCH Date/Time 1235 A. Freier 10-9-12	Received By/Stored In Date/Time Fed Ex	
Relinquished By/Removed From Date/Time FED EX	Received By/Stored In Date/Time 10/10/12 0930	
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time	

REVIEWED BY CMB DATE 10-9-12

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

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 10/10/12 0930 CoC No. RC-148-056

Container I.D. No. WCH-12-025 Requested TAT (Days) 21 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 1 Sample Matrix S
7. Number of containers per sample: 2 (Or see CoC _____)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [X] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH N/A Preservative _____
13. Describe any anomalies:
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by [illegible] Date: 10/10/12 Time: 0935

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J1R2T9	480						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 150487 Calibration date 06DEC11