SAF-RC-225
100K Remaining Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 1/24/13
INITIAL/DATE

COMMENTS:

SDG KP0170 SAF-RC-225

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-K-86

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

22 January 2013

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 #	1301012
SDG #	KP0170
SAF #	RC-225
Date Received	01/04/13
# Samples	3
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	X
PAHs	X
Herbicides	
Metals	
Inorganics	

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 25 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only
1301012

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-225
Est. Final Proj. Sampling Date KP0170
Project#
Project Contact/Phone#
Lionville Laboratory Project Manager O Johnson
QC SW Del ~~UP~~ Std TAT 7 Days

Date Rec'd 1-4-13 OS 1/4/13 Date Due 1-11-13

		A	B
Refrigerator #		2	2
#/Type Container	Liquid		
	Solid	1AG	1AG
Volume	Liquid		
	Solid	125	125
Preservatives		—	—
ANALYSES REQUESTED		PAH	WTPH-D

ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

Lionville Laboratory Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	PAH 8310	WTPH-D 8015 DRO	Metal	CN
01	J1R7D6			Soil	12-31-12	0840						X		
02	J1R7D7			Soil	12-31-12	0955						X		
03	J1R7D8			Soil	12-31-12	1020					X			

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	1/4/13	1025

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-225-080	Page 1 of 1

Collector Brackett, R	**Company Contact** Joan Kessner	**Telephone No.** (509) 375-4688	**Project Coordinator** KESSNER, JH
Price Code 8B	**Data Turnaround** 7 Days		
Project Designation 100K Remaining Waste Sites - Soil In-Process	**Sampling Location** 100-K-86		**SAF No.** RC-225
Ice Chest No. WCH-12-021	**Field Logbook No.** EL-1666	**COA** 010K862600	**Method of Shipment** FedEx
Shipped To EBERLINE SERVICES / LIONVILLE DWS 12/31/12	**Offsite Property No.** ~~A 120628~~ A120687 AJ 1-2-13		**Bill of Lading/Air Bill No.** See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	Cool 4C									
Type of Container	aG	aG									
No. of Container(s)	1	1									
Volume	125mL	125mL									
SAMPLE ANALYSIS	TPH-Diesel Range - WTPH-D +	PAH ~~8270~~ AJ 8310 12/31/12									
Sample No.	Matrix *	Sample Date	Sample Time								
J1R7D6	SOIL	12/31/12	0840	X							
J1R7D7	SOIL	12/31/12	0955	X							
J1R7D8	SOIL	12/31/12	1020		X						
~~J1R7D9~~	SOIL										
~~J1R7F0~~ BH 12/31/12	SOIL										

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Rob Brackett RB	12-31-12 1045	Received By/Stored In: BHudson BHudson	12/31/12 1045
Relinquished By/Removed From: BHUDSON BHudson	12/31/12 1050	Received By/Stored In: DWSHEA DWSHEA	12/31/12 1050
Relinquished By/Removed From: DWSHEA DWSHEA	12/31/12 1222	Received By/Stored In: Cindy Bingham	12-31-12 1222
Relinquished By/Removed From: Cindy Bingham	1060H1 WCH 1-2-13 1240	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	1-4-13 1025	Received By/Stored In: Victor Hernandez	1-4-13 1025
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

REVIEWED BY AJ
DATE 1-2-13

KP0170

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

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

WCH-EE-011

0000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-225

Date: 1/4/13

LvL Batch #: L301012

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7944275354 76
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	**Temp** 2-3	°C	Cooler # WCH-12-021
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, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) 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-1112.doc

PAHs

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

WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0170	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 22:38

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R7D8	1301012-03	Soil	12/31/2012 10:20	01/04/2013 10:25

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-225 KP0170
LVL #: 1301012

W.O. #: 60049-001-001-0001-00
Date Received: 01-04-2013

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 12-31-2012.

The sample and associated QC samples were extracted 01-05-2013 and analyzed 01-07-2013 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. One (1) of thirty-two matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR #13GC001) has been enclosed.
7. The sample was reported on a dry weight basis.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

Iain Daniels
LvL Laboratory Manager

1/11/13
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 13GC001

Initiator: Catherine Carey
Date: 01/08/13
Client: WC Hanford

Batch: 1301012
Samples: MSD1
Method: SW846/MCAWW/CLP/

Parameter: PAH
Matrix: SOIL
Prep Batch: L301028

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)

Acenaphthylene recovery is high in ~~BS~~ MSD1
CAC 01/08/13

BS1 + MS1 okay

2. Known or Probable Causes(s)

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

Other Description:

Narrate ID.

4. Project Manager Instructions...signature/date: 1/11/13
__ 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: 1/11/13

Other Explanation:

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

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

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

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

QA-139-A-0208

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0170	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 22:38

J1R7D8

1301012-03 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	**18.6**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Acenaphthylene	**8.55**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Acenaphthene	3.54	U	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Fluorene	3.54	U	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Phenanthrene	**6.38**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Anthracene	3.54	U	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Fluoranthene	**25.8**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Indeno[1,2,3-cd]pyrene	3.54	U	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Pyrene	**39.4**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Benz[a]anthracene	**21.6**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Chrysene	**13.8**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Benzo[b] fluoranthene	**12.7**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Benzo[k] fluoranthene	**3.37**	J	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Benzo[a] pyrene	**23.5**		3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Dibenz[a,h]anthracene	**2.18**	J	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Benzo[g,h,i] perylene	3.54	U	3.54	ug/kg dry	1	L301028	01/05/2013	01/07/2013	8310
Surrogate: Triphenylene	*99 %*		*68-129*			*L301028*	*01/05/2013*	*01/07/2013*	*8310*

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0170	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 22:38

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 L301028 - SW 3540C										
Blank (L301028-BLK1)				Prepared: 01/05/2013 Analyzed: 01/07/2013						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	3.33	U	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*154*			*ug/kg wet*	*166.67*		*92*	*68-129*		
LCS (L301028-BS1)				Prepared: 01/05/2013 Analyzed: 01/07/2013						
Naphthalene	134		3.33	ug/kg wet	166.67		80	0-127		
Acenaphthylene	146		3.33	ug/kg wet	166.67		88	50-140		
Acenaphthene	139		3.33	ug/kg wet	166.67		84	17-139		
Fluorene	146		3.33	ug/kg wet	166.67		87	28-145		
Phenanthrene	148		3.33	ug/kg wet	166.67		89	30-152		
Anthracene	154		3.33	ug/kg wet	166.67		92	19-171		
Fluoranthene	151		3.33	ug/kg wet	166.67		90	34-159		
Indeno[1,2,3-cd]pyrene	159		3.33	ug/kg wet	166.67		95	31-156		
Pyrene	154		3.33	ug/kg wet	166.67		92	33-152		
Benz[a]anthracene	163		3.33	ug/kg wet	166.67		98	32-157		
Chrysene	155		3.33	ug/kg wet	166.67		93	31-159		
Benzo[b] fluoranthene	165		3.33	ug/kg wet	166.67		99	33-164		
Benzo[k] fluoranthene	162		3.33	ug/kg wet	166.67		97	28-161		
Benzo[a] pyrene	166		3.33	ug/kg wet	166.67		99	29-149		
Dibenz[a,h]anthracene	164		3.33	ug/kg wet	166.67		98	27-153		
Benzo[g,h,i] perylene	164		3.33	ug/kg wet	166.67		99	32-157		
Surrogate: Triphenylene	*151*			*ug/kg wet*	*166.67*		*91*	*68-129*		

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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0170	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 22:38

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 L301028 - SW 3540C									
Matrix Spike (L301028-MS1)	**Source: 1301012-03**		Prepared: 01/05/2013 Analyzed: 01/07/2013						
Naphthalene	176	3.56	ug/kg dry	178.08	18.6	88	0-127		
Acenaphthylene	202	3.56	ug/kg dry	178.08	8.55	109	50-140		
Acenaphthene	130	3.56	ug/kg dry	178.08	3.54 U	73	17-139		
Fluorene	171	3.56	ug/kg dry	178.08	3.54 U	96	28-145		
Phenanthrene	180	3.56	ug/kg dry	178.08	6.38	97	30-152		
Anthracene	179	3.56	ug/kg dry	178.08	3.54 U	100	19-171		
Fluoranthene	224	3.56	ug/kg dry	178.08	25.8	111	34-159		
Indeno[1,2,3-cd]pyrene	188	3.56	ug/kg dry	178.08	3.54 U	106	31-156		
Pyrene	215	3.56	ug/kg dry	178.08	39.4	98	33-152		
Benz[a]anthracene	208	3.56	ug/kg dry	178.08	21.6	105	32-157		
Chrysene	195	3.56	ug/kg dry	178.08	13.8	101	31-159		
Benzo[b] fluoranthene	202	3.56	ug/kg dry	178.08	12.7	106	33-164		
Benzo[k] fluoranthene	176	3.56	ug/kg dry	178.08	3.37	97	28-161		
Benzo[a] pyrene	209	3.56	ug/kg dry	178.08	23.5	104	29-149		
Dibenz[a,h]anthracene	181	3.56	ug/kg dry	178.08	2.18	101	27-153		
Benzo[g,h,i] perylene	215	3.56	ug/kg dry	178.08	3.54 U	121	32-157		
Surrogate: Triphenylene	*202*		*ug/kg dry*	*178.08*		*113*	*68-129*		
Matrix Spike Dup (L301028-MSD1)	**Source: 1301012-03**		Prepared: 01/05/2013 Analyzed: 01/07/2013						
Naphthalene	182	3.57	ug/kg dry	178.44	18.6	92	0-127	4	40
Acenaphthylene	269	3.57	ug/kg dry	178.44	8.55	146*	50-140	29	40
Acenaphthene	139	3.57	ug/kg dry	178.44	3.54 U	78	17-139	6	40
Fluorene	163	3.57	ug/kg dry	178.44	3.54 U	91	28-145	5	40
Phenanthrene	207	3.57	ug/kg dry	178.44	6.38	113	30-152	14	40
Anthracene	176	3.57	ug/kg dry	178.44	3.54 U	98	19-171	2	40
Fluoranthene	283	3.57	ug/kg dry	178.44	25.8	144	34-159	26	40
Indeno[1,2,3-cd]pyrene	186	3.57	ug/kg dry	178.44	3.54 U	104	31-156	1	40
Pyrene	248	3.57	ug/kg dry	178.44	39.4	117	33-152	17	40
Benz[a]anthracene	229	3.57	ug/kg dry	178.44	21.6	116	32-157	10	40
Chrysene	212	3.57	ug/kg dry	178.44	13.8	111	31-159	9	40
Benzo[b] fluoranthene	185	3.57	ug/kg dry	178.44	12.7	97	33-164	9	40
Benzo[k] fluoranthene	174	3.57	ug/kg dry	178.44	3.37	96	28-161	1	40
Benzo[a] pyrene	207	3.57	ug/kg dry	178.44	23.5	103	29-149	1	40
Dibenz[a,h]anthracene	179	3.57	ug/kg dry	178.44	2.18	99	27-153	2	40
Benzo[g,h,i] perylene	218	3.57	ug/kg dry	178.44	3.54 U	122	32-157	1	40
Surrogate: Triphenylene	*200*		*ug/kg dry*	*178.44*		*112*	*68-129*		

PREPARATION BENCH SHEET

L301028

Lionville Laboratory

Printed: 1/7/2013 9:13:19AM

Matrix: Solid **Prepared using: Extraction - SW 3540C** **Surrogate used: 120061**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1301012-03	8310 PAH	01/05/2013 12:09	30.32	5				50	WC-Hanford, Inc.	
1301014-01	8310 PAH	01/05/2013 12:09	30.18	5				50	WC-Hanford, Inc.	
1301014-02	8310 PAH	01/05/2013 12:09	30.65	5				50	WC-Hanford, Inc.	
1301014-03	8310 PAH	01/05/2013 12:09	31.38	5				50	WC-Hanford, Inc.	
1301014-04	8310 PAH	01/05/2013 12:09	30.29	5				50	WC-Hanford, Inc.	
1301014-05	8310 PAH	01/05/2013 12:09	30.24	5				50	WC-Hanford, Inc.	
1301014-06	8310 PAH	01/05/2013 12:09	30.08	5				50	WC-Hanford, Inc.	
1301014-07	8310 PAH	01/05/2013 12:09	30.09	5				50	WC-Hanford, Inc.	
1301014-08	8310 PAH	01/05/2013 12:09	30.24	5				50	WC-Hanford, Inc.	
1301014-09	8310 PAH	01/05/2013 12:09	30.24	5				50	WC-Hanford, Inc.	
1301014-10	8310 PAH	01/05/2013 12:09	30.17	5				50	WC-Hanford, Inc.	
1301014-11	8310 PAH	01/05/2013 12:09	30.34	5				50	WC-Hanford, Inc.	
1301014-12	8310 PAH	01/05/2013 12:09	30.97	5				50	WC-Hanford, Inc.	
L301028-BLK1	QC	01/05/2013 12:09	30	5				50		
L301028-BS1	QC	01/05/2013 12:09	30	5	1200436		50	50		
L301028-MS1	QC	01/05/2013 12:09	30.19	5	1200436	1301012-03	50	50		
L301028-MS2	QC	01/05/2013 12:09	30.8	5	1200436	1301014-02	50	50		
L301028-MSD1	QC	01/05/2013 12:09	30.13	5	1200436	1301012-03	50	50		
L301028-MSD2	QC	01/05/2013 12:09	30.48	5	1200436	1301014-02	50	50		

sample delivered on 1/4/13

Extracts Relinquished By — Date 1/2/13 0913

Extracts Received By — Date LK 1-7-13

DRO/MO

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-225 Project Number: KP0170 Project Manager: Joan Kessner	**Reported:** 01/08/2013 23:30

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R7D6	1301012-01	Soil	12/31/2012 08:40	01/04/2013 10:25
J1R7D7	1301012-02	Soil	12/31/2012 09:55	01/04/2013 10:25

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-225 KP0170
LVL #: 1301012

W.O. #: 60049-001-001-0001-00
Date Received: 01-04-2013

DIESEL RANGE ORGANICS

Two (2) soil samples were collected on 12-31-2012.

The samples and associated QC samples were extracted 01-04-2013 and analyzed 01-06,07-2013 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

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

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

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

3. One (1) of Six (6) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 13GC003) has been enclosed.

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

5. All blank spike recoveries were within acceptance criteria.

6. Two (2) of two matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 13GC003) has been enclosed.

7. The samples J1R7D6, L301026-MS2, L301026-MSD2, and J1R7D7 required 2-fold instrument dilutions due to high concentrations of target analytes.

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. The samples were reported on a dry weight basis.

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

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

Iain Daniels
LvL Laboratory Manager

1/11/13
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 13 GC003

Initiator: Catherine Carey
Date: 01/08/13
Client: WC Hanford

Batch: 1301012
Samples: MS2 + MSD2
Method: SW846/MCAWW/CLP/

Parameter: DRO
Matrix: SOIL
Prep Batch: L301026

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)

spike recoveries are high in MS2/MSD2

surrogate recovery high in MSD2

2. Known or Probable Causes(s)

high concentration of target analyte (MO) in sample

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 ID.

4. Project Manager Instructions...signature/date: 1/11/13

__ 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: 1/11/13 Other Explanation:

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

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

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

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

QA-139-A-0208

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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-225	
2620 Fermi Avenue	Project Number: KP0170	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 23:30

Extractable Petroleum Hydrocarbons by SW846 8015
Lionville Laboratory

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R7D6 (1301012-01) Soil								
Surrogate: p-Terphenyl	*98 %*	*39-129*			*L301026*	*01/04/2013 16:15*	*01/08/2013 07:51*	*8015M*
Diesel Range Organics	7330 U	7330	ug/kg dry	2	L301026	01/04/2013 16:15	01/08/2013 07:51	8015M
Motor Oil	309000	22000	ug/kg dry	2	L301026	01/04/2013 16:15	01/08/2013 07:51	8015M
J1R7D7 (1301012-02) Soil								
Surrogate: p-Terphenyl	*104 %*	*39-129*			*L301026*	*01/04/2013 16:15*	*01/08/2013 06:53*	*8015M*
Diesel Range Organics	6990 U	6990	ug/kg dry	2	L301026	01/04/2013 16:15	01/08/2013 06:53	8015M
Motor Oil	236000	21000	ug/kg dry	2	L301026	01/04/2013 16:15	01/08/2013 06:53	8015M

Lionville Laboratory, PADEP Lab ID# 15-00009
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WC-Hanford, Inc.	Project: RC-225	
2620 Fermi Avenue	Project Number: KP0170	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	01/08/2013 23:30

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 L301026 - SW 3540C									
Blank (L301026-BLK1)			Prepared: 01/04/2013 14:34 Analyzed: 01/06/2013 22:56						
Diesel Range Organics	3330 U	3330	ug/kg wet						
Motor Oil	10000 U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*6610*		*ug/kg wet*	*6666.7*		*99*	*39-129*		
LCS (L301026-BS1)			Prepared: 01/04/2013 14:34 Analyzed: 01/06/2013 23:54						
Diesel Range Organics	58600	3330	ug/kg wet	66667		88	42-133		
Surrogate: p-Terphenyl	*6620*		*ug/kg wet*	*6666.7*		*99*	*39-129*		
Matrix Spike (L301026-MS2)	**Source: 1301012-01**		Prepared: 01/04/2013 14:34 Analyzed: 01/08/2013 08:49						
Diesel Range Organics	234000	7180	ug/kg dry	71802	7330 U	326*	42-133		
Surrogate: p-Terphenyl	*6590*		*ug/kg dry*	*7180.2*		*92*	*39-129*		
Matrix Spike Dup (L301026-MSD2)	**Source: 1301012-01**		Prepared: 01/04/2013 14:34 Analyzed: 01/08/2013 09:47						
Diesel Range Organics	268000	7310	ug/kg dry	73090	7330 U	367*	42-133	12	40
Surrogate: p-Terphenyl	*9660*		*ug/kg dry*	*7309.0*		*132**	*39-129*		

PREPARATION BENCH SHEET

L301026

Lionville Laboratory

Printed: 1/11/2013 11:51:27AM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1201463**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1301011-01	8015M DRO	01/04/2013 13:46	30.21	1				1000	WC-Hanford, Inc.	
1301012-01	8015M DRO	01/04/2013 13:46	30.04	1				1000	WC-Hanford, Inc.	
1301012-02	8015M DRO	01/04/2013 13:46	31.16	1				1000	WC-Hanford, Inc.	
1301013-01	8015M DRO	01/04/2013 13:46	30.08	1				1000	WC-Hanford, Inc.	
1301013-02	8015M DRO	01/04/2013 13:46	30.18	1				1000	WC-Hanford, Inc.	
L301026-BLK1	QC	01/04/2013 13:46	30	1				1000		
L301026-BS1	QC	01/04/2013 13:46	30	1	1201538		1000	1000		
L301026-MS1	QC	01/04/2013 13:46	30.01	1	1201538	1301011-01	1000	1000		
L301026-MS2	QC	01/04/2013 13:46	30.65	1	1201538	1301012-01	1000	1000		
L301026-MS3	QC	01/04/2013 13:46	30.18	1	1201538	1301013-01	1000	1000		
L301026-MSD1	QC	01/04/2013 13:46	30.34	1	1201538	1301011-01	1000	1000		
L301026-MSD2	QC	01/04/2013 13:46	30.11	1	1201538	1301012-01	1000	1000		
L301026-MSD3	QC	01/04/2013 13:46	30.29	1	1201538	1301013-01	1000	1000		

revision for prep time aem 1/11/13

Extracts Relinquished By Date

Extracts Received By Date

PREPARATION BENCH SHEET

L301026

Lionville Laboratory

Printed: 1/5/2013 11:44:25AM

Matrix: Solid

Prepared using: Extraction - SW 3540C

Surrogate used: 1201463

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1301011-01	8015M DRO	01/04/2013 14:34	30.21	1				1000	WC-Hanford, Inc.	
1301012-01	8015M DRO	01/04/2013 16:15	30.04	1				1000	WC-Hanford, Inc.	
1301012-02	8015M DRO	01/04/2013 16:15	31.16	1				1000	WC-Hanford, Inc.	
1301013-01	8015M DRO	01/04/2013 16:15	30.08	1				1000	WC-Hanford, Inc.	
1301013-02	8015M DRO	01/04/2013 16:15	30.18	1				1000	WC-Hanford, Inc.	
L301026-BLK1	QC	01/04/2013 14:34	30	1				1000		
L301026-BS1	QC	01/04/2013 14:34	30	1	1201538		1000	1000		
L301026-MS1	QC	01/04/2013 14:34	30.01	1	1201538	1301011-01	1000	1000		
L301026-MS2	QC	01/04/2013 14:34	30.65	1	1201538	1301012-01	1000	1000		
L301026-MS3	QC	01/04/2013 14:34	30.18	1	1201538	1301013-01	1000	1000		
L301026-MSD1	QC	01/04/2013 14:34	30.34	1	1201538	1301011-01	1000	1000		
L301026-MSD2	QC	01/04/2013 14:34	30.11	1	1201538	1301012-01	1000	1000		
L301026-MSD3	QC	01/04/2013 14:34	30.29	1	1201538	1301013-01	1000	1000		

1/5/13 1145

Extracts Relinquished By Date

Extracts Received By Date