0099674

SAF-RC-207
Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites – In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 9/22/11
INITIAL/DATE

COMMENTS:

SDG K3612 SAF-RC-207

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: stockpile 100-C-034 at 100-C-7:1

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OCT 13 2011
EDMC

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A Division of Eberline Analytical Corporation

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SEP 2011

21 September 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
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 #	1108117
SDG #	K3612
SAF #	RC-207
Date Received	08/30/11
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Odette S. Johnson
Project Manager

LVL
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A division of Fisher Analytical Corporation

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-207 Project Number: K3612 Project Manager: Joan Kessner	Reported: 09/16/2011 12:29

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1KTT7	1108117-01	Soil	08/25/2011 09:35	08/30/2011 10:05

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Case Narrative

Client: WC-HANFORD RC-207
LVL#: 1108117
SDG/SAF#: K3612/RC-207

W.O.#: 60049-001-001-0001-00
Date Received: 08-30-11

METALS

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

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

1. This narrative covers the analyses of 1soil sample and 1 TCLP leachate sample.

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

   The TCLP leachate samples were analyzed and reported with 5-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 LvLI's sample acceptance policy.

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

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

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, or 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. All laboratory control samples (LCS) were within the 80-120% control limits.

10. The matrix spike (MS) recoveries for 7 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 23 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 level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1KTT7	Aluminum	22,000	63.6
	Antimony	100	87.0
	Calcium	20,800	22.5
	Chromium	1,100	89.4
	Iron	22,000	0.0*
	Manganese	1,000	38.0
	Silicon	2,100	83.1

* The PDS concentration for Iron was prepared at too low a level for a recovery.

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Antimony and Cobalt were less than ten times the MDL.

13. The TCLP extract from sample J1KTT7 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

14. The TCLP duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL.

15. 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.

16. 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.

17. 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

9/20/11
Date

alm/08-117hg%

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag)
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference

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Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

J1KTT7

1108117-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**9860**		3.88	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Antimony	**0.375**	B	0.465	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Arsenic	**4.38**		0.776	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Barium	**70.7**		0.388	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Beryllium	**0.399**		0.155	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Boron	**1.37**	B	1.55	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Cadmium	**0.178**		0.155	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Calcium	**7330**		77.6	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Chromium	**80.3**		0.155	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Cobalt	**10.3**		1.55	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Copper	**18.5**		0.776	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Iron	**27400**		15.5	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Lead	**6.06**		0.388	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Magnesium	**6080**		58.2	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Manganese	**392**		3.88	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Molybdenum	**0.440**	B	1.55	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Nickel	**12.5**		3.10	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Potassium	**1650**		310	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Selenium	0.233	U	0.233	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Silicon	**661**		1.55	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Silver	0.155	U	0.155	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Sodium	**476**		38.8	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Vanadium	**65.4**		1.94	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Zinc	**55.6**		7.76	mg/kg dry	1	L109173	09/13/2011	09/14/2011	6010B
Mercury	0.0249	U	0.0249	mg/kg dry	1	L109207	09/15/2011	09/15/2011	7471A

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Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

J1KTT7

1108117-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Metals by SW846 1311 6000/7000 series									
Arsenic	**0.0115**	B	0.0750	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Barium	**0.184**		0.00500	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Cadmium	0.0150	U	0.0150	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Chromium	**3.22**		0.0250	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Lead	**0.0131**	B	0.0500	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Selenium	0.100	U	0.100	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Silver	0.0300	U	0.0300	mg/L	5	L109002	09/01/2011	09/07/2011	6010
Mercury	0.200	U	0.200	ug/L	1	L109029	09/02/2011	09/06/2011	7470

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2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

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 L109173 - SW 3050B										
Blank (L109173-BLK1)				Prepared: 09/13/2011 Analyzed: 09/14/2011						
Aluminum	4.55	U	4.55	mg/kg wet						
Antimony	0.545	U	0.545	mg/kg wet						
Arsenic	0.909	U	0.909	mg/kg wet						
Barium	0.455	U	0.455	mg/kg wet						
Beryllium	0.182	U	0.182	mg/kg wet						
Boron	1.82	U	1.82	mg/kg wet						
Cadmium	0.182	U	0.182	mg/kg wet						
Calcium	7.77	B	90.9	mg/kg wet						
Chromium	0.182	U	0.182	mg/kg wet						
Cobalt	1.82	U	1.82	mg/kg wet						
Copper	0.909	U	0.909	mg/kg wet						
Iron	18.2	U	18.2	mg/kg wet						
Lead	0.455	U	0.455	mg/kg wet						
Magnesium	68.2	U	68.2	mg/kg wet						
Manganese	4.55	U	4.55	mg/kg wet						
Molybdenum	1.82	U	1.82	mg/kg wet						
Nickel	3.64	U	3.64	mg/kg wet						
Potassium	364	U	364	mg/kg wet						
Selenium	0.273	U	0.273	mg/kg wet						
Silicon	1.82	U	1.82	mg/kg wet						
Silver	0.182	U	0.182	mg/kg wet						
Sodium	45.5	U	45.5	mg/kg wet						
Vanadium	2.27	U	2.27	mg/kg wet						
Zinc	9.09	U	9.09	mg/kg wet						
Duplicate (L109173-DUP1)			**Source: 1108117-01**	Prepared: 09/13/2011 Analyzed: 09/14/2011						
Aluminum	8210		4.06	mg/kg dry		9860			18.3	20
Antimony	0.251	B	0.488	mg/kg dry		0.375			39.6*	20
Arsenic	3.70		0.813	mg/kg dry		4.38			16.8	20
Barium	61.3		0.406	mg/kg dry		70.7			14.2	20
Beryllium	0.338		0.163	mg/kg dry		0.399			16.5	20
Boron	1.21	B	1.63	mg/kg dry		1.37			11.8	20
Cadmium	0.161	B	0.163	mg/kg dry		0.178			9.88	20
Calcium	6000		81.3	mg/kg dry		7330			19.9	20
Chromium	56.1		0.163	mg/kg dry		80.3			35.5*	20
Cobalt	8.05		1.63	mg/kg dry		10.3			24.6*	20
Copper	17.1		0.813	mg/kg dry		18.5			7.62	20

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

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 L109173 - SW 3050B										
Duplicate (L109173-DUP1)		**Source: 1108117-01**		Prepared: 09/13/2011 Analyzed: 09/14/2011						
Iron	24200		16.3	mg/kg dry		27400			12.4	20
Lead	5.31		0.406	mg/kg dry		6.06			13.3	20
Magnesium	5370		60.9	mg/kg dry		6080			12.5	20
Manganese	359		4.06	mg/kg dry		392			8.71	20
Molybdenum	0.375	B	1.63	mg/kg dry		0.440			15.8	20
Nickel	9.38		3.25	mg/kg dry		12.5			28.9*	20
Potassium	1420		325	mg/kg dry		1650			14.7	20
Selenium	0.244	U	0.244	mg/kg dry		0.233 U				20
Silicon	687		1.63	mg/kg dry		661			3.92	20
Silver	0.163	U	0.163	mg/kg dry		0.155 U				20
Sodium	417		40.6	mg/kg dry		476			13.1	20
Vanadium	57.3		2.03	mg/kg dry		65.4			13.3	20
Zinc	48.7		8.13	mg/kg dry		55.6			13.2	20
Matrix Spike (L109173-MS1)		**Source: 1108117-01**		Prepared: 09/13/2011 Analyzed: 09/14/2011						
Aluminum	13200		4.49	mg/kg dry	179.61	9860	1870*	75-125		20
Antimony	16.3		0.539	mg/kg dry	44.901	0.375	35.5*	75-125		20
Arsenic	159		0.898	mg/kg dry	179.61	4.38	86.3	75-125		20
Barium	244		0.449	mg/kg dry	179.61	70.7	96.4	75-125		20
Beryllium	4.28		0.180	mg/kg dry	4.4901	0.399	86.3	75-125		20
Boron	72.3		1.80	mg/kg dry	89.803	1.37	79.0	75-125		20
Cadmium	4.11		0.180	mg/kg dry	4.4901	0.178	87.6	75-125		20
Calcium	10200		89.8	mg/kg dry	2245.1	7330	129*	75-125		20
Chromium	112		0.180	mg/kg dry	17.961	80.3	178*	75-125		20
Cobalt	46.1		1.80	mg/kg dry	44.901	10.3	79.8	75-125		20
Copper	39.7		0.898	mg/kg dry	22.451	18.5	94.5	75-125		20
Iron	26900		18.0	mg/kg dry	89.803	27400	-540*	75-125		20
Lead	40.3		0.449	mg/kg dry	44.901	6.06	76.2	75-125		20
Magnesium	8610		67.4	mg/kg dry	2245.1	6080	113	75-125		20
Manganese	458		4.49	mg/kg dry	44.901	392	148*	75-125		20
Molybdenum	76.5		1.80	mg/kg dry	89.803	0.440	84.7	75-125		20
Nickel	48.7		3.59	mg/kg dry	44.901	12.5	80.5	75-125		20
Potassium	3900		359	mg/kg dry	2245.1	1650	100	75-125		20
Selenium	151		0.269	mg/kg dry	179.61	0.233 U	83.9	75-125		20
Silicon	1040		1.80	mg/kg dry	89.803	661	427*	75-125		20
Silver	3.57		0.180	mg/kg dry	4.4901	0.155 U	79.6	75-125		20
Sodium	2720		44.9	mg/kg dry	2245.1	476	99.8	75-125		20

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

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 L109173 - SW 3050B									
Matrix Spike (L109173-MS1)		**Source: 1108117-01**		Prepared: 09/13/2011 Analyzed: 09/14/2011					
Vanadium	102	2.25	mg/kg dry	44.901	65.4	81.7	75-125		20
Zinc	96.8	8.98	mg/kg dry	44.901	55.6	91.7	75-125		20
Reference (L109173-SRM1)				Prepared: 09/13/2011 Analyzed: 09/14/2011					
Aluminum	10300	10.7	mg/kg wet	6670.0		155	0-200.89		
Antimony	58.0	1.29	mg/kg wet	53.000		110	0-235.8		
Arsenic	116	2.14	mg/kg wet	114.00		102	82.8-117.54		
Barium	315	1.07	mg/kg wet	307.00		103	79.8-120.2		
Beryllium	105	0.429	mg/kg wet	108.00		97.4	82.8-117.6		
Boron	76.3	4.29	mg/kg wet	85.100		89.7	67.5-132.8		
Cadmium	230	0.429	mg/kg wet	225.00		102	83.6-116.4		
Calcium	2980	214	mg/kg wet	3360.0		88.6	83.3-116.9		
Chromium	83.4	0.429	mg/kg wet	77.200		108	73.3-126.4		
Cobalt	162	4.29	mg/kg wet	166.00		97.4	80.7-118.7		
Copper	258	2.14	mg/kg wet	271.00		95.4	80.8-119.2		
Iron	8060	42.9	mg/kg wet	8420.0		95.7	78.6-121.1		
Lead	173	1.07	mg/kg wet	190.00		90.8	81.6-118.4		
Magnesium	8570	161	mg/kg wet	8570.0		100	83.2-116.7		
Manganese	976	10.7	mg/kg wet	965.00		101	69.3-130.5		
Molybdenum	242	4.29	mg/kg wet	235.00		103	76.2-123.8		
Nickel	213	8.57	mg/kg wet	221.00		96.5	79.6-120.8		
Potassium	14100	857	mg/kg wet	14400		98.2	81.9-118.1		
Selenium	195	0.643	mg/kg wet	187.00		104	75.9-124.6		
Silicon	861	4.29	mg/kg wet	807.00		107	0-219.3		
Silver	79.9	0.429	mg/kg wet	83.500		95.7	82.7-117.1		
Sodium	9110	107	mg/kg wet	9730.0		93.6	82.5-117.2		
Vanadium	100	5.36	mg/kg wet	98.700		102	75.9-123.6		
Zinc	200	21.4	mg/kg wet	199.00		100	78.4-121.6		

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

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 L109207 - SW 7471A Prep										
Blank (L109207-BLK1)				Prepared & Analyzed: 09/15/2011						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L109207-DUP1)		Source: 1108117-01		Prepared & Analyzed: 09/15/2011						
Mercury	0.0271	U	0.0271	mg/kg dry		0.0249 U				20
Matrix Spike (L109207-MS1)		Source: 1108117-01		Prepared & Analyzed: 09/15/2011						
Mercury	0.152		0.0263	mg/kg dry	0.14625	0.0249 U	104	75-125		20
Reference (L109207-SRM1)				Prepared & Analyzed: 09/15/2011						
Mercury	1.20		0.0300	mg/kg wet	1.2900		92.9	62.6-138		

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WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

TCLP Metals by SW846 1311 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 L109002 - SW 3010A										
Blank (L109002-BLK1)				Prepared: 09/01/2011 Analyzed: 09/07/2011						
Arsenic	0.0150	U	0.0150	mg/L						
Barium	0.00100	U	0.00100	mg/L						
Cadmium	0.00300	U	0.00300	mg/L						
Chromium	0.00500	U	0.00500	mg/L						
Lead	0.0100	U	0.0100	mg/L						
Selenium	0.0200	U	0.0200	mg/L						
Silver	0.00600	U	0.00600	mg/L						
Blank (L109002-BLK2)				Prepared: 09/01/2011 Analyzed: 09/07/2011						
Arsenic	0.0750	U	0.0750	mg/L						
Barium	0.00500	U	0.00500	mg/L						
Cadmium	0.0150	U	0.0150	mg/L						
Chromium	0.0250	U	0.0250	mg/L						
Lead	0.0500	U	0.0500	mg/L						
Selenium	0.100	U	0.100	mg/L						
Silver	0.0300	U	0.0300	mg/L						
LCS (L109002-BS1)				Prepared: 09/01/2011 Analyzed: 09/07/2011						
Arsenic	9.83		0.0150	mg/L	10.000		98.3	80-120		20
Barium	5.09		0.00100	mg/L	5.0000		102	80-120		20
Cadmium	0.242		0.00300	mg/L	0.25000		96.8	80-120		20
Chromium	0.503		0.00500	mg/L	0.50000		101	80-120		20
Lead	2.43		0.0100	mg/L	2.5000		97.2	80-120		20
Selenium	9.57		0.0200	mg/L	10.000		95.7	80-120		20
Silver	0.484		0.00600	mg/L	0.50000		96.8	80-120		20
Duplicate (L109002-DUP1)		Source: 1108117-01		Prepared: 09/01/2011 Analyzed: 09/07/2011						
Arsenic	0.0105	B	0.0750	mg/L		0.0115			9.42	20
Barium	0.177		0.00500	mg/L		0.184			4.07	20
Cadmium	0.0150	U	0.0150	mg/L		0.0150 U				20
Chromium	3.12		0.0250	mg/L		3.22			3.03	20
Lead	0.0150	B	0.0500	mg/L		0.0131			14.0	20
Selenium	0.100	U	0.100	mg/L		0.100 U				20
Silver	0.0300	U	0.0300	mg/L		0.0300 U				20

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

WC-Hanford, Inc.	Project: RC-207	
2620 Fermi Avenue	Project Number: K3612	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/16/2011 12:29

TCLP Metals by SW846 1311 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 L109002 - SW 3010A										
Matrix Spike (L109002-MS1)		**Source: 1108117-01**		Prepared: 09/01/2011 Analyzed: 09/07/2011						
Arsenic	5.15		0.0750	mg/L	5.0000	0.0115	103	50-1000		20
Barium	98.0		0.00500	mg/L	100.00	0.184	97.8	50-1000		20
Cadmium	1.02		0.0150	mg/L	1.0000	0.0150 U	102	50-1000		20
Chromium	8.48		0.0250	mg/L	5.0000	3.22	105	50-1000		20
Lead	4.90		0.0500	mg/L	5.0000	0.0131	97.6	50-1000		20
Selenium	1.02		0.100	mg/L	1.0000	0.100 U	102	50-1000		20
Silver	3.97		0.0300	mg/L	5.0000	0.0300 U	79.5	50-1000		20
Batch L109029 - SW 7470A Prep										
Blank (L109029-BLK1)				Prepared: 09/02/2011 Analyzed: 09/06/2011						
Mercury	0.200	U	0.200	ug/L						
Blank (L109029-BLK3)				Prepared: 09/02/2011 Analyzed: 09/06/2011						
Mercury	0.200	U	0.200	ug/L						
LCS (L109029-BS1)				Prepared: 09/02/2011 Analyzed: 09/06/2011						
Mercury	4.77		0.200	ug/L	5.0606		94.3	80-120		20
Duplicate (L109029-DUP2)		**Source: 1108117-01**		Prepared: 09/02/2011 Analyzed: 09/06/2011						
Mercury	0.200	U	0.200	ug/L		0.200 U				20
Matrix Spike (L109029-MS2)		**Source: 1108117-01**		Prepared: 09/02/2011 Analyzed: 09/06/2011						
Mercury	176		10.0	ug/L	202.12	0.200 U	87.3	50-1000		20

Lionville Laboratory Logbook #: 996

SAMPLE DIGESTION RECORD

Digestion Batch #: L109173
Date/Time Initiated: 9/13/11 1245
Date/Time Completed: 9/13/11 1700
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 48
BLOCK 1 2 (circle one)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1108117-01		0.66	50		TO	Fine	Brown	Rocks	N/A
L109177-Dp1		0.63	50						
-MS1	0.5	0.57	50						
1109017-01		0.66	50			Coarse	Brown	Rocks	
L109177-Dp2		0.60	50						
-MS2	0.5	0.59	50						
1109017-02		0.69	50			Coarse	Brown	Rocks	
-03		0.66	50			coarse	Brown	Rocks	
-04		0.75	50			Coarse	Brown	Rocks	
1109020-01		0.67	50				yellow cloth	Liquid	
L109173-Dp3		0.60	50						
-MS3	0.5	0.51	50						
1109048-01		0.75	50			Fine	Brown	Rocks	
L109173-Dp4		0.69	50						
-MS4	0.5	0.59	50						
1109048-02		0.57	50			Fine	Brown	Rocks	
03		0.54	50			Fine	Brown	Rocks	
04		0.51	50			Fine	Brown	Rocks	
1109049-01		0.57	50			Fine	Brown	Rocks	
L109173-Dp5		0.60	50						
-MS5	0.5	0.57	50						
-BLK1		0.55	50			Coarse	Boiling Chips		
-SRM1		0.70	50			Fine	Dusty pink sand		

JJS 9/13/11

Spiking IDs / Expiration Date:
MS#: 1101064

LCS#: 1100103

Reagent IDs:
HNO_3 1T19036
HCl 1T20037
H_2O_2 H03 A11
1:1 HNO_3 637-050-04
1:1 HCl

File ID#:

Data Review By/Date: [signature] 9/14/11

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Signed\SPI\Metals Digestion log.doc

Page #:

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Lionville Laboratory

Logbook #: 996

SAMPLE DIGESTION RECORD

Digestion Batch #: L109002
Date/Time Initiated: 9/1/11 1130
Date/Time Completed: 9/2/11 1235
Analyst: JJ
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
NOTE: All temperatures are recorded as corrected temperatures

Digested / Undigested (circle one)
Balance #: N/A
Balance Cal Verification: Y NA
Temp: 96
BLOCK 1 2 (circle one)

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1108117-01		50	50	<2	TC	N/A	C/C	N/A	N/A
L109002-Dp1		50	50	<2					
-MS1	0.5	50	50	<2					
-BLK1		50	50				C/C		
-BS1	0.5	50	50				C/C		
-BLK2		50	50	<2			C/C		

JJ
9/2/11

Spiking IDs / Expiration Date:
MS#: 1100338
1100217

LCS#: 1100020

Reagent IDs:
HNO_3 K19036
HCl
H_2O_2
1:1 HNO_3
1:1 HCl 637-047-02

File ID#:

Data Review By/Date: [signature] 9/2/11

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†: Associated with L108368

Page #:

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Lionville Laboratory

MERCURY PREPARATION

Logbook # 992

Analyst: [illegible]
Date 9/14/11 – 9/15/11
Start Time/Temp: 1700/93°
End Time/Temp: 1730/94°

Instrument ID: HG3.1
Balance # 329 /NA
Pipette Calibration (Daily) (Y)

Prep Batch: L109207
Worksheet: HG091501
SOP No. ME-HgCVAA
BLOCK 1 2 (3) (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
blank				10ml	50	
0.2 ug/l		0.100		10ml	50	
1.0 ug/l		0.500		10ml	50	
2.0 ug/l		1.000		10ml	50	
5.0 ug/l		2.500		10ml	50	
10.0 ug/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L109207-BLK1				0.31	50	
SRM1		(illegible)	(illegible)	0.30	50	
1108117-01				0.37	50	
L109207-DUP1				0.34	50	
MS1		0.500	1.0	0.35	50	
1108136-01				0.33	50	
L109207-DUP2				0.34	50	
MS2		0.500	1.0	0.38	50	
1108136-02				0.36	50	
03				0.38	50	
04				0.36	50	
1108137-01				0.39	50	RAD
L109207-DUP3				0.34	50	
MS3		0.500	1.0	0.34	50	
1109004-02				0.38	50	
L109207-DUP4				0.35	50	
MS4		0.500	1.0	0.36	50	
1109017-01				0.36	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1001785B	9/15/11 1415
ICV/CCV/LCS	I.V. 1101256A	

Reviewed By/Date: [illegible] 9/16/11

see book # 9368 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1100103

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

Lionville Laboratory

MERCURY PREPARATION

Logbook # 992

Analyst: [illegible]
Date 9/14/11 – 9/15/11
Start Time/Temp:
End Time/Temp: See pg 165

Instrument ID: HG3, 1
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Prep Batch: L109207
Worksheet: HG091501
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one) (3)

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.
L109207-DUP5				0.35	50	
MS5		0.500	1.0	0.38	50	
1109017-02				0.36	50	
03				0.39	50	
04				0.37	50	
1109066-01				0.37	50	
L109207-DUP6				0.36	50	
MS6		0.500	1.0	0.35	50	

[illegible] 9/14/11

Standard:	ID	Prep Date/Time
ICAL/MS		
ICV/CCV/LCS		

Reviewed By/Date: [illegible] 9/16/11

see book # 9368 for std traceability information

Soil LCS True Value = See pg 165 mg/Kg
Standard #

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

Lionville Laboratory

MERCURY PREPARATION

Logbook # 992

Analyst: [signature]
Date 9/2/11
Start Time/Temp: 1330/95°
End Time/Temp: 1540/94°

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

Prep Batch: L109029
Worksheet: HG090601
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				33	33	
0.2 ug/l		0.0667		33	33	
1.0 ug/l		0.333		33	33	
2.0 ug/l		0.667		33	33	
5.0 ug/l		1.667		33	33	
10.0 ug/l		3.333		33	33	
ICV		0.0835	2.5	33	33	
CCV		0.167	5.0	33	33	
ICB/CCB				33	33	
L109029-BLK1				33	33	
BS1		0.167	5.0	33	33	
BLK2	<			33	33	L108343
BLK3	<			33	33	L108368
1108099-01	<			33	33	
L109029-DUP1 *	<			33	33	
MS1 W.E. [initials] 9/2/11	~~<~~	0.667	200*	33	33	
1108099-02 *	<			33	33	*dup on 02, insuff vol.
03	<			33	33	
04	<			33	33	
05	<			33	33	
06	<			33	33	
1108117-01	<			33	33	
L109029-DUP2	<			33	33	
MS2		0.667	200*	33	33	
1108126-01	<			16.5	33	dil. due to insuff. vol.
L109029-DUP3 (*)	<			16.5	33	dup on 02 insuff. vol.
MS3		0.133	40(200)*	6.7	33	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1001785B	9/2/11 1140
ICV/CCV/LCS	I.V. 1001781A	↓

Reviewed By/Date: [signature] 9/2/11

see book # 9368 for std traceability information

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

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

* used 1001785A (10 ug/ml)

Lionville Laboratory

MERCURY PREPARATION

Logbook # 992

Analyst: [signature]
Date 9/2/11
Start Time/Temp: See pg 107
End Time/Temp:

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

Prep Batch: L109029
Worksheet: HG090601
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.
1108126-02 (*)	<			16.5	33	dil. due to insuff. vol.
03	<			33	33	
04	<			33	33	
05	<			33	33	
06	<			33	33	
07	<			33	33	
08	<			33	33	
09	<			33	33	
10	<			33	33	
				~~33~~	~~33~~	[illegible] 9/2/11

[illegible] 9/2/11

Standard:	ID	Prep Date/Time
ICAL/MS		
ICV/CCV/LCS		

Reviewed By/Date: [signature] 9/7/11

see book # 9368 for std traceability information

Soil LCS True Value = See page 107 mg/Kg
Standard #

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

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 978

Start Date: 8-31-11 Start Time: 12:05 Analyst: RH SOP: SPI-1311.1	End Date: 9-1-11 End Time: 8:40 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L108368 Leachate Page: 1 of 3 Room Temp. (°C): Start 21 /Finish 21 Acceptance Criteria: 23°C ± 2°

LvL #: 1108117-01 Client ID#: JIKTT7 pH After 5 Min: 7.40 pH After Acid/Heat: 1.83 Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 25 Extract Fluid Vol.(mL): 500 pH After Extraction: 5.37	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL #: 1108126-01 Client ID#: JIKTK2 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.26	Initial Filtration Data and Comments: Solids: ____% / NA WIPES Initial Filtrate Added:
LvL #: 1108126-02 Client ID#: JIKTK3 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.25	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL #: 1108126-03 Client ID#: JIKTK-4 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.27	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date [illegible] 9/2/11

SPI-1311.1-A-0310

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Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 978

Start Date: 8-31-11 Start Time: 12:05 Analyst: RH SOP: SPI-1311.1	End Date: 9-1-11 End Time: 8:00 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L108368 Leachate Page: 3 of 3 Room Temp. (°C): Start 21 /Finish 21 Acceptance Criteria: 23°C ± 2°

LvL #: 1108126-08 Client ID#: JIKTK9 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.27	Initial Filtration Data and Comments: Solids: ____% / NA WIPES Initial Filtrate Added:
LvL #: 1108126-09 Client ID#: JIKTL0 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.26	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL # 1108126-10 Client ID#: JIKTL1 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.90 Sample Wt.(g): 4 Extract Fluid Vol.(mL): 80 pH After Extraction: 5.24	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
LvL #: L108368 Client ID#: N/A pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): 500 pH After Extraction: N/A	Initial Filtration Data and Comments: Solids: ____% / NA BLANK Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date [illegible] 9/7/11

SPI-1311.1-A-0310

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Lionville Laboratory Use Only
1108117

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

000000021

Client: WC Hanford SAF# RC-207
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SH TAT: 21 Days

Date Rec'd: 8/30/11 Date Due: 9/20/11

		A			B →				
Refrigerator #		1			2 →				
#/Type Container	Liquid								
	Solid	1P			1AG →				
Volume	Liquid								
	Solid	125			125 →				
Preservatives		—			— →				
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb	INORG: Metal Hg	CN	TCLP TCLP	Met Hg

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	Metal Hg	CN	TCLP	Met Hg
01	J1KTT7	✓	✓	S	8/25/11	0935					X		X	X

Special Instructions:

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

Relinquished by	Received by	Date	Time
[signature]	[signature]	8/30/11	1005

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

1108117

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-207-034	Page 1 of 1

Collector R. Berven	Company Contact Joan Kessner Telephone No. 509-375-4688	Project Coordinator KESSNER, JH	Price Code 8L Data Turnaround 21 Days
Project Designation Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	Sampling Location stockpile 100-C-034 at 100-C-7:1	SAF No. RC-207	
Ice Chest No. 8/24/11 WCH 11-057	Field Logbook No. EL-1655-02 COA R100C72600	Method of Shipment Fed Ex	
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A100845	Bill of Lading/Air Bill No. See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool, 4 degrees Centigrade

Preservation	Cool 4C	None									
Type of Container	G/P	aG									
No. of Container(s)	1	1									
Volume	125mL	125mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
J1KTT7	SOIL	8-25-11	0935	X	X								

COPY AJ 8-29-11

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R. Berven	8-25-11 0945	R. Fahlberg	8-25-11 0945
R. Fahlberg	8-25-11 1540	[illegible]	8/25/11 1540
[illegible] WCH	8/29/11 1000	Fed Ex	
[illegible]	8/30/11 1005	Victor Hernandez	8/30/11 1005

SPECIAL INSTRUCTIONS

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

(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470 {Mercury}

REVIEWED BY AJ DATE 8-29-11

Matrix *

S=Soil
SE=Sediment
SO=Solid
SJ=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

000000022

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford

Project/SAF/SOW/Release #: RC-006

Date: 8/30/11

LvL Batch #: 1108117

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7974 6010 3011
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-11-057
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 _____