SAF-RC-040
300 Area D4 Waste Characterization Sampling - Other Solid
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required KW 8/22/12
INITIAL/DATE

COMMENTS:

SDG K3951 SAF RC-040

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

REVISED TO INCLUDE TCLP METALS

Sample Location/Waste Site: 3906A Sediment

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
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July 25, 2012

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-07-038-7734 SDG K3951

Dear Ms. Kessner:

Enclosed is the data report for one solid (other solid) sample designated under SAF No. RC-040. The sample was received at Eberline Analytical on July 13, 2012. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Joseph Verville
Client Services Manager

NJV/

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3951 was composed of one solid (other solid) sample designated under SAF No. RC-040 with a Project Designation of: 300 Area D4 Waste Characterization Sampling – Other Solid.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on July 25, 2012.

The sample consisted of 786 g of sediment. Results are reported in units of pCi/g.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Joseph Verville **Client Services Manager**	7/25/12 **Date**

E B E R L I N E A N A L Y T I C A L / R I C H M O N D
SAMPLE DELIVERY GROUP K3951

SDG	7734
Contact	N.Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K3951

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

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Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	RC-040
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	07/25/12

SDG 7734
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/25/12

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

SDG 7734
Contact N.Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S207038-01	J1NKR6	3906A Sediment	OTHER		RC-040	RC-040-746	07/12/12 10:40
S207038-02	Lab Control Sample		OTHER		RC-040		
S207038-03	Method Blank		OTHER		RC-040		
S207038-04	Duplicate (S207038-01)	3906A Sediment	OTHER		RC-040		07/12/12 10:40

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

SDG 7734
Contact N.Joseph Verville

QC SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7734	RC-040-746	J1NKR6	OTHER	100.0	786 g		07/13/12	1	S207038-01	7734-001
		Method Blank	OTHER						S207038-03	7734-003
		Lab Control Sample	OTHER						S207038-02	7734-002
		Duplicate (S207038-01)	OTHER		786 g		07/13/12	1	S207038-04	7734-004

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

SDG 7734
Contact N.Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
93A	OTHER	Gross Alpha in Solids	7734-078	20.6	1			1	1	1/1		
93B	OTHER	Gross Beta in Solids	7734-078	20.6	1			1	1	1/1		
Gamma Spectroscopy												
GAM	OTHER	Gamma Scan	7734-078	7.0	1			1	1	1/1		

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

SDG 7734
Contact N.Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S207038-01	J1NKR6			7734-001	93A/93		07/23/12	07/24/12	BW	Gross Alpha in Solids
07/12/12	3906A Sediment		OTHER	7734-001	93B/93		07/23/12	07/24/12	BW	Gross Beta in Solids
07/13/12	RC-040-746	RC-040		7734-001	GAM		07/17/12	07/18/12	CSS	Gamma Scan
S207038-02	Lab Control Sample			7734-002	93A/93		07/23/12	07/24/12	BW	Gross Alpha in Solids
			OTHER	7734-002	93B/93		07/23/12	07/24/12	BW	Gross Beta in Solids
		RC-040		7734-002	GAM		07/17/12	07/18/12	CSS	Gamma Scan
S207038-03	Method Blank			7734-003	93A/93		07/23/12	07/24/12	BW	Gross Alpha in Solids
			OTHER	7734-003	93B/93		07/23/12	07/24/12	BW	Gross Beta in Solids
		RC-040		7734-003	GAM		07/17/12	07/18/12	CSS	Gamma Scan
S207038-04	Duplicate (S207038-01)			7734-004	93A/93		07/23/12	07/24/12	BW	Gross Alpha in Solids
07/12/12	3906A Sediment		OTHER	7734-004	93B/93		07/23/12	07/24/12	BW	Gross Beta in Solids
07/13/12		RC-040		7734-004	GAM		07/18/12	07/18/12	CSS	Gamma Scan

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	RC-040	Gross Alpha in Solids	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	RC-040	Gross Beta in Solids	900.0_ALPHABETA_GPC	1			1	1	1	4
GAM	RC-040	Gamma Scan	GAMMA_GS	1			1	1	1	4
TOTALS				3			3	3	3	12

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

7734-003 Method Blank

METHOD BLANK

SDG	7734	Client/Case no	Hanford	SDG K3951	
Contact	N.Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S207038-03	Client sample id	Method Blank		
Dept sample id	7734-003	Material/Matrix		OTHER	
		SAF No	RC-040		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.676	1.8	4.25	10.0	U	93A
Gross Beta	12587-47-2	-0.300	3.4	5.81	15.0	U	93B
Potassium 40	13966-00-2	U		0.128		U	GAM
Cobalt 60	10198-40-0	U		0.009	0.050	U	GAM
Cesium 137	10045-97-3	U		0.009	0.100	U	GAM
Radium 226	13982-63-3	U		0.018	0.100	U	GAM
Radium 228	15262-20-1	U		0.037	0.200	U	GAM
Europium 152	14683-23-9	U		0.023	0.100	U	GAM
Europium 154	15585-10-1	U		0.026	0.100	U	GAM
Europium 155	14391-16-3	U		0.021	0.100	U	GAM
Thorium 228	14274-82-9	U		0.018		U	GAM
Thorium 232	TH-232	U		0.037		U	GAM
Uranium 235	15117-96-1	U		0.043	0.300	U	GAM
Uranium 238	U-238	U		0.948	10.0	U	GAM
Americium 241	14596-10-2	U		0.022	0.300	U	GAM
Niobium 94	14681-63-1	U		0.008		U	GAM
Antimony 125	14234-35-6	U		0.019		U	GAM
Barium 133	13981-41-4	U		0.009		U	GAM

QC-BLANK #82112

Lab id	EBRLNE
Protocol	RC-040
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

7734-002 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7734 Client/Case no Hanford SDG K3951

Contact N.Joseph Verville Contract No. S00W235A01

Lab sample id S207038-02 Client sample id Lab Control Sample

Dept sample id 7734-002 Material/Matrix OTHER

SAF No RC-040

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
Gross Alpha	123	14	3.70	10.0		93A	101	4.0	122	57-143	80-120
Gross Beta	83.2	7.7	7.08	15.0		93B	84.4	3.4	99	66-134	80-120
Cobalt 60	0.405	0.014	0.006	0.050		GAM	0.418	0.017	97	87-113	80-120
Cesium 137	0.478	0.013	0.009	0.100		GAM	0.487	0.019	98	87-113	80-120

QC-LCS #82111

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

7734-004 J1NKR6

DUPLICATE

SDG	7734	Client/Case no	Hanford SDG K3951
Contact	N.Joseph Verville	Contract	No. S00W235A01
DUPLICATE		ORIGINAL	
Lab sample id	S207038-04	Lab sample id	S207038-01
Dept sample id	7734-004	Dept sample id	7734-001
		Received	07/13/12
		% solids	100.0
Client sample id	J1NKR6		
Location/Matrix	3906A Sediment OTHER		
Collected/Weight	07/12/12 10:40 786 g		
Custody/SAF No	RC-040-746 RC-040		

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
Gross Alpha	21.6	5.2	3.07	10.0		93A	24.8	5.7	3.22		14	66	0.6
Gross Beta	93.5	7.1	5.63	15.0		93B	99.1	7.3	5.56		6	47	0.4
Potassium 40	6.71	0.28	0.099			GAM	6.19	0.45	0.222		8	19	1.3
Cobalt 60	U		0.012	0.050	U	GAM	U		0.026	U	-		1.0
Cesium 137	0.194	0.018	0.016	0.100		GAM	0.205	0.029	0.028		6	30	0.6
Radium 226	0.238	0.026	0.026	0.100		GAM	0.213	0.044	0.046		11	37	0.9
Radium 228	0.341	0.057	0.056	0.200		GAM	0.300	0.093	0.100		13	53	0.7
Europium 152	U		0.035	0.100	U	GAM	U		0.063	U	-		0.8
Europium 154	U		0.039	0.100	U	GAM	U		0.080	U	-		0.9
Europium 155	U		0.048	0.100	U	GAM	U		0.080	U	-		0.7
Thorium 228	0.331	0.019	0.018			GAM	0.435	0.043	0.043		27	24	3.4
Thorium 232	0.341	0.057	0.056			GAM	0.300	0.093	0.100		13	53	0.7
Uranium 235	U		0.133	0.300	U	GAM	U		0.218	U	-		0.7
Uranium 238	U		4.52	10.0	U	GAM	U		2.92	U	-		0.6
Americium 241	U		0.061	0.300	U	GAM	U		0.202	U	-		1.3
Niobium 94	U		0.010		U	GAM	U		0.020	U	-		0.9
Antimony 125	U		0.030		U	GAM	U		0.057	U	-		0.8
Barium 133	U		0.014		U	GAM	U		0.029	U	-		0.9

QC-DUP#1 82113

300 Area D4 Waste Characterization Sampling-OtherSolid

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

7734-001 J1NKR6

DATA SHEET

SDG	7734	Client/Case no	Hanford SDG K3951
Contact	N.Joseph Verville	Contract	No. S00W235A01
Lab sample id	S207038-01	Client sample id	J1NKR6
Dept sample id	7734-001	Location/Matrix	3906A Sediment OTHER
Received	07/13/12	Collected/Weight	07/12/12 10:40 786 g
% solids	100.0	Custody/SAF No	RC-040-746 RC-040

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	24.8	5.7	3.22	10.0		93A
Gross Beta	12587-47-2	99.1	7.3	5.56	15.0		93B
Potassium 40	13966-00-2	6.19	0.45	0.222			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	0.205	0.029	0.028	0.100		GAM
Radium 226	13982-63-3	0.213	0.044	0.046	0.100		GAM
Radium 228	15262-20-1	0.300	0.093	0.100	0.200		GAM
Europium 152	14683-23-9	U		0.063	0.100	U	GAM
Europium 154	15585-10-1	U		0.080	0.100	U	GAM
Europium 155	14391-16-3	U		0.080	0.100	U	GAM
Thorium 228	14274-82-9	0.435	0.043	0.043			GAM
Thorium 232	TH-232	0.300	0.093	0.100			GAM
Uranium 235	15117-96-1	U		0.218	0.300	U	GAM
Uranium 238	U-238	U		2.92	10.0	U	GAM
Americium 241	14596-10-2	U		0.202	0.300	U	GAM
Niobium 94	14681-63-1	U		0.020		U	GAM
Antimony 125	14234-35-6	U		0.057		U	GAM
Barium 133	13981-41-4	U		0.029		U	GAM

300 Area D4 Waste Characterization Sampling-OtherSolid

Lab id	EBRLNE
Protocol	RC-040
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

Test 93A	Matrix OTHER
SDG 7734	
Contact N.Joseph Verville	

LAB METHOD SUMMARY

GROSS ALPHA IN SOLIDS

GAS PROPORTIONAL COUNTING

Client Hanford	
Contract No. S00W235A01	
Contract SDG K3951	

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha
Preparation batch 7734-078					
S207038-01	93		7734-001	J1NKR6	24.8
S207038-02	93		7734-002	Lab Control Sample	HIGH
S207038-03	93		7734-003	Method Blank	U
S207038-04	93		7734-004	Duplicate (S207038-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	10.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7734-078			2σ prep error 20.6 % Reference Lab Notebook 7734 pg. 78													
S207038-01	93		J1NKR6	3.22	0.100			37		100			11	07/19/12	07/23	GRB-105
S207038-02	93		Lab Control Sample	3.70	0.100			62		100				07/19/12	07/23	GRB-107
S207038-03	93		Method Blank	4.25	0.100			62		100				07/19/12	07/23	GRB-109
S207038-04	93		Duplicate (S207038-01)	3.07	0.100			37		100			11	07/19/12	07/23	GRB-111
Nominal values and limits from method				10.0	0.100			0-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	SPP-125	Gross Alpha and Gross Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD	MDA	3.56	± 1.07
FOR 4 SAMPLES	RESIDUE	50	± 29

Lab id	EBRLNE
Protocol	RC-040
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

Test 93B	Matrix OTHER
SDG 7734	
Contact N.Joseph Verville	

LAB METHOD SUMMARY

GROSS BETA IN SOLIDS

GAS PROPORTIONAL COUNTING

Client Hanford	
Contract No. S00W235A01	
Contract SDG K3951	

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Beta
Preparation batch 7734-078					
S207038-01	93		7734-001	J1NKR6	99.1
S207038-02	93		7734-002	Lab Control Sample	ok
S207038-03	93		7734-003	Method Blank	U
S207038-04	93		7734-004	Duplicate (S207038-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	15.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7734-078 2σ prep error 20.6 % Reference Lab Notebook 7734 pg. 78																
S207038-01	93		J1NKR6	5.56	0.100			37		100			11	07/19/12	07/23	GRB-105
S207038-02	93		Lab Control Sample	7.08	0.100			62		100				07/19/12	07/23	GRB-107
S207038-03	93		Method Blank	5.81	0.100			62		100				07/19/12	07/23	GRB-109
S207038-04	93		Duplicate (S207038-01)	5.63	0.100			37		100			11	07/19/12	07/23	GRB-111
Nominal values and limits from method				15.0	0.100			0-250		100			180			

PROCEDURES	REFERENCE	900.0_ALPHABETA_GPC
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	SPP-125	Gross Alpha and Gross Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD	MDA	6.02	± 1.43
FOR 4 SAMPLES	RESIDUE	50	± 29

Lab id	EBRLNE
Protocol	RC-040
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	07/25/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3951

Test GAM Matrix OTHER
SDG 7734
Contact N.Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K3951

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7734-078						
S207038-01			7734-001	J1NKR6	U	0.205
S207038-02			7734-002	Lab Control Sample	ok	ok
S207038-03			7734-003	Method Blank	U	U
S207038-04			7734-004	Duplicate (S207038-01)	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.100

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7734-078			2σ prep error 7.0 %	Reference Lab Notebook 7734 pg. 78												
S207038-01			J1NKR6	0.060	694					221			5	07/17/12	07/17	MB,05,00
S207038-02			Lab Control Sample	0.006	600					879				07/17/12	07/17	01,04,00
S207038-03			Method Blank	0.020	600					199				07/17/12	07/17	01,04,00
S207038-04			Duplicate (S207038-01)	0.023	694					202			6	07/17/12	07/18	02,02,00
Nominal values and limits from method				0.050	600					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	SPP-060	Soil Preparation, rev 0
	SPP-100	Preparation of Sample for Gamma Spectroscopy, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.027 ± 0.046
YIELD ____ ± ____

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 07/25/12

SDG 7734
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/25/12

SDG 7734
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/25/12

SDG 7734
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
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Version 3.06
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SDG 7734
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

Lab id EBRLNE
Protocol RC-040
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Version 3.06
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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

SDG 7734
Contact N.Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/25/12

SDG 7734
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REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3951

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7734
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REPORT GUIDE

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Contract No. S00W235A01
Case no SDG K3951

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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Protocol RC-040
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GUIDE, cont.

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Contract No. S00W235A01
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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

SDG 7734
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REPORT GUIDE

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

Lab id EBRLNE
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GUIDE, cont.

Client Hanford
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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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Contact N.Joseph Verville

REPORT GUIDE

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Contract No. S00W235A01
Case no SDG K3951

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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Version 3.06
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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-040-746	Page 1 of 1

Collector: R STRICKLAND	Company Contact: Tom Edmundson	Telephone No.: 509.947.5192	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: 15 Days		
Project Designation: 300 Area D4 Waste Characterization Sampling - Other Solid	Sampling Location: SMS 7-12-12 ~~3906~~, 3906A, ~~3906B~~ Sediment (K3951) 7734		SAF No.: RC-040
Ice Chest No.: SGRP-138-02	Field Logbook No.: SMS 7/12/12 EL-1518-~~2826~~	COA: RD4MXX2F00	Method of Shipment: FEDEX
Shipped To: EBERLINE SERVICES/ LIONVILLE	Offsite Property No.: A110303		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

~~Cool 4 degrees C~~ N/A SMS 7/12/12

Preservation	Cool 4C	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	aG	aG	G/P	G/P						
No. of Container(s)	1	1	0	1	0						
Volume	250mL	250mL	60mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						

Sample No.	Matrix *	Sample Date	Sample Time										
J1NKR6	OTHER SOLID	07/12/12	1040				✓	✓					
J1NKR7	OTHER SOLID												
J1NKR8	OTHER SOLID SMS 7-12-12												
J1NKR9	OTHER SOLID												

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
R STRICKLAND / R Strickland	07/12/12 1400	FED EX	
FED EX		M-NATAWAMAN	07/13/12 0932

SPECIAL INSTRUCTIONS

(1) Metals - TC Primary Constituents {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals - TC Primary Constituents {Mercury}
(2) Gamma Spec (Client List) {Americium-241, Antimony-125, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}

*Please analyze solids only.

REVIEWED BY SMS
DATE 7/12/12

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

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 07/13/12 0930 CoC No. RC-040-746

Container I.D. No. SGRP-138-02 Requested TAT (Days) 15 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 X SOLID
7. Number of containers per sample: 1 (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 [ ] 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 [signature] Date: 07/13/12 Time: 1100

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
JINKR6	<80						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100485 Calibration date 06 DEC 11

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

27 July 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 #	1207032
SDG #	K3951
SAF #	RC-040
Date Received	07/14/12
# Samples	1
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	X
Pest/PCB	X
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

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 48 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only
1207032

Custody Transfer Record/Lab Work Request

Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client W.C. Hanford SAF# RC-040
Est. Final Proj. Sampling Date
Project#
Project Contact/Phone#
Lionville Laboratory Project Manager Arletta Johnson
QC SW Del Std. TAT 15 days

Date Rec'd 7.14.12 Date Due 7-29-12

		A							B							
Refrigerator #			2						2							
#/Type Container	Liquid															
	Solid		1agl						1agl							
Volume	Liquid															
	Solid		250						250							
Preservatives			—						—							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	~~Pest/~~ PCB	Herb				Metal + Hg	CN						
		Lionville Laboratory Use Only														
			8270	8082					Met + Hg							

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		8270	8082					Met + Hg							
01	JINKRL	✓	✓	SO	7.12.12	1040		X	X					X							

Special Instructions:
O Met= RCRA list

Special Instructions:
7/16/12 RS 1. Analyze solids only per client COC
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[signature]	7.14.12	11:00

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-040-746	Page 1 of 1

Collector: RL STRICKLAND	Company Contact: Tom Edmundson	Telephone No.: 509.947.5192	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: 15 Days		
Project Designation: 300 Area D4 Waste Characterization Sampling - Other Solid	Sampling Location: SMS 7-12-12 ~~3906~~, 3906A, ~~3906B~~ Sediment	SAF No.: RC-040	
Ice Chest No.: WCH-11-038	Field Logbook No.: SMS EL-1518 ~~25~~ 26 7-12-12	COA: RD4MXX2F00	Method of Shipment: FEDEX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A110406		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	Cool 4C	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	aG	aG	G/P	G/P						
No. of Container(s)	1	1	0	1	0						
Volume	250mL	250mL	60mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						

Sample No.	Matrix *	Sample Date	Sample Time										
J1NKR6	OTHER SOLID	07/12/12	1040	✓	✓	✓							
J1NKR7	OTHER SOLID												
J1NKR8	OTHER SOLID												
J1NKR9	OTHER SOLID												

SMS 7-12-12

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RL Strickland WCH	07/12/12 1400	FED EX	
FED EX	7-14-12 11:00	[illegible]	7-14-12 11:00

SPECIAL INSTRUCTIONS

(1) Metals - TC Primary Constituents {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals - TC Primary Constituents {Mercury}
(2) Gamma Spec (Client List) {Americium-241, Antimony-125, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}

*Please analyze solids only.

REVIEWED BY SMS
DATE 7/12/12

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

000000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAF/SOW/Release #: RC-040

Date: 7-14-12

LvL Batch #: 1207032

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7986 1445 6921
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** 8.2	°C	Cooler # WCH-11-038
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 See #5	
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 See #5	
16. Project Manager contacted concerning any discrepancies?	☑ Yes	☐ No	☐ N/A
Person Contacted OJ		Date 7-14-12	

SR-002-B.doc

SEMIVOLATILES

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-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NKR6	1207032-01	Other Solid	07/12/2012 10:40	07/14/2012 11:00

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-040 K3951
LVL #: 1207032

W.O. #: 60049-001-001-0001-00
Date Received: 07-14-2012

SEMIVOLATILE

One (1) other solid sample was collected on 07-12-2012.

The sample and associated QC samples were extracted 07-19-2012 and analyzed 07-21,23,25-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for client specified target compounds.

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

1. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.

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

3. Due to the sample matrix, the samples had an elevated final volume of 4 mls. Reporting limits have been adjusted to reflect this change.

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

5. Samples J1NKR6, L207112-MS2 and L207112-MSD2 required 10-fold instrument dilutions due to the sample matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

6. One (1) of thirty (30) obtainable surrogate recoveries was outside acceptance criteria. The surrogate recovery criteria were not met for sample J1NKR6 due to possible matrix effect; however, the MS2/MSD2 was within criteria.

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

8. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS139) has been enclosed.

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

9. Thirty-one (31) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS139) has been enclosed. Several matrix spike recoveries were unobtainable due to dilution required for analysis.

10. The sample was reported on a wet weight 'as received' basis.

11. 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.

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

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

14. 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").

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

Iain Daniels
LvL Laboratory Manager

7/21/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS139

Initiator: Sharon Saylor
Date: 7-26-12
Client: WCHunter

Batch: 1207032
Samples: L207112-851, ms2, msd2
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: SOIL
Prep Batch: L207112

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 L207112-851

② Spike recoveries outside QC acceptance limits in L207112-ms2 and L207112-msd2

2. Known or Probable Causes(s) ① Acidic phenols are subject to erratic chromatographic behavior ② Possible matrix effect, samples required a 10-fold dilution for analysis and had an elevated final volume of 4mls

7/27/12

3. Discussion and Proposed Action Other Description: namte

__ 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: 7/27/12

__ 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: 7/27/12 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

000000010

TABLE 1

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

MEAN RSD USED FOR EVALUATION: 8.59 CALIBRATION: 1207013

>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:	K3951
Client:	WC-Hanford, Inc.	Project:	RC-040
Sequence:	2070070	Instrument:	HP5972N
Matrix:	Solid	Calibration:	1207013

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2070070-TUN1	N072101.D	07/21/12 15:04
Cal Standard	2070070-CAL5	N072102.D	07/21/12 15:27
Cal Standard	2070070-CAL1	N072103.D	07/21/12 16:17
Cal Standard	2070070-CAL2	N072104.D	07/21/12 17:05
Cal Standard	2070070-CAL3	N072105.D	07/21/12 17:54
Cal Standard	2070070-CAL4	N072106.D	07/21/12 18:42
Secondary Cal Check	2070070-SCV1	N072107.D	07/21/12 19:31
Blank	L207112-BLK1	N072109.D	07/21/12 21:08

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K3951
Client:	WC-Hanford, Inc.	Project:	RC-040
Sequence:	2070071	Instrument:	HP5972N
Matrix:	Solid	Calibration:	1207013

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2070071-TUN1	N072301.D	07/23/12 11:26
Calibration Check	2070071-CCV1	N072302.D	07/23/12 11:49
LCS	L207112-BS1	N072304.D	07/23/12 13:27

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K3951
Client:	WC-Hanford, Inc.	Project:	RC-040
Sequence:	2070077	Instrument:	HP5972N
Matrix:	Solid	Calibration:	1207013

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2070077-TUN1	N072501.D	07/25/12 10:21
Calibration Check	2070077-CCV1	N072502.D	07/25/12 10:44
J1NKR6	1207032-01	N072512.D	07/25/12 18:51
J1NKR6	L207112-MS2	N072513.D	07/25/12 19:39
J1NKR6	L207112-MSD2	N072514.D	07/25/12 20:28

GLOSSARY

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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

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

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

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

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

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

J1NKR6
1207032-01 (Other Solid)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
1,2-Dichlorobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
1,3-Dichlorobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
1,4-Dichlorobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4,5-Trichlorophenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4,6-Trichlorophenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4-Dichlorophenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4-Dimethylphenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4-Dinitrophenol	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,4-Dinitrotoluene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2,6-Dinitrotoluene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Chloronaphthalene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Chlorophenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Methylnaphthalene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Methylphenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Nitroaniline	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
2-Nitrophenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
3,3'-Dichlorobenzidine	26300	U	26300	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
3-Nitroaniline	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4,6-Dinitro-2-methylphenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Bromophenyl Phenyl Ether	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Chloro-3-methylphenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Chloroaniline	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Chlorophenyl Phenyl Ether	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
3- and/or 4-Methylphenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Nitroaniline	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
4-Nitrophenol	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Acenaphthene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Acenaphthylene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Anthracene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Benz[a]anthracene	**3830**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Benzo[a] pyrene	**4180**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Benzo[b] fluoranthene	**3650**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Benzo[g,h,i] perylene	**2750**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Benzo[k] fluoranthene	**3790**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Bis(2-chloroethoxy) methane	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C

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

WC-Hanford, Inc.	Project: RC-040	
2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/27/2012 15:19

J1NKR6
1207032-01 (Other Solid)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Bis(2-chloroethyl) ether	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Bis(2-chloroisopropyl) ether	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Bis(2-ethylhexyl) phthalate	**4060**	J, D	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Butyl Benzyl Phthalate	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Carbazole	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Chrysene	**5850**	D, J	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Dibenz[a,h]anthracene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Dibenzofuran	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Diethyl Phthalate	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Dimethyl Phthalate	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Di-n-butyl Phthalate	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Di-n-octyl Phthalate	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Fluoranthene	**2580**	D, J	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Fluorene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Hexachlorobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Hexachlorobutadiene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Hexachlorocyclopentadiene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Hexachloroethane	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Indeno[1,2,3-cd]pyrene	**2760**	D, J	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Isophorone	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Naphthalene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Nitrobenzene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
N-Nitrosodi-n-propylamine	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
N-Nitrosodiphenylamine	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Pentachlorophenol	65700	U	65700	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Phenanthrene	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Phenol	13100	U	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Pyrene	**4860**	D, J	13100	ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
TIC:Aldol Condensate 1	**70900**	A, B, J, D		ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
TIC:Unknown 1	**3200**	D, J, ~~B~~ NA		ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
TIC:Unknown 2	**3190**	D, J		ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
TIC:Unknown 3	**3820**	D, J		ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
TIC:Unknown 4	**8670**	J, D		ug/kg	10	L207112	07/19/2012	07/25/2012	8270C
Surrogate: 2-Fluorophenol	*70 %*		*25-121*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*
Surrogate: Phenol-d5	*57 %*		*24-113*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*56 %*		*23-120*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

J1NKR6
1207032-01 (Other Solid)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*70 %*	*30-115*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*16 % **	*19-122*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*90 %*	*18-137*			*L207112*	*07/19/2012*	*07/25/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
Blank (L207112-BLK1)				Prepared: 07/19/2012 Analyzed: 07/21/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg						
1,2-Dichlorobenzene	330	U	330	ug/kg						
1,3-Dichlorobenzene	330	U	330	ug/kg						
1,4-Dichlorobenzene	330	U	330	ug/kg						
2,4,5-Trichlorophenol	330	U	330	ug/kg						
2,4,6-Trichlorophenol	330	U	330	ug/kg						
2,4-Dichlorophenol	330	U	330	ug/kg						
2,4-Dimethylphenol	330	U	330	ug/kg						
2,4-Dinitrophenol	1650	U	1650	ug/kg						
2,4-Dinitrotoluene	330	U	330	ug/kg						
2,6-Dinitrotoluene	330	U	330	ug/kg						
2-Chloronaphthalene	330	U	330	ug/kg						
2-Chlorophenol	330	U	330	ug/kg						
2-Methylnaphthalene	330	U	330	ug/kg						
2-Methylphenol	330	U	330	ug/kg						
2-Nitroaniline	1650	U	1650	ug/kg						
2-Nitrophenol	330	U	330	ug/kg						
3,3'-Dichlorobenzidine	660	U	660	ug/kg						
3-Nitroaniline	1650	U	1650	ug/kg						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg						
4-Chloro-3-methylphenol	330	U	330	ug/kg						
4-Chloroaniline	330	U	330	ug/kg						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg						
3- and/or 4-Methylphenol	330	U	330	ug/kg						
4-Nitroaniline	1650	U	1650	ug/kg						
4-Nitrophenol	1650	U	1650	ug/kg						
Acenaphthene	330	U	330	ug/kg						
Acenaphthylene	330	U	330	ug/kg						
Anthracene	330	U	330	ug/kg						
Benz[a]anthracene	330	U	330	ug/kg						
Benzo[a] pyrene	330	U	330	ug/kg						
Benzo[b] fluoranthene	330	U	330	ug/kg						
Benzo[g,h,i] perylene	330	U	330	ug/kg						
Benzo[k] fluoranthene	330	U	330	ug/kg						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
Blank (L207112-BLK1)				Prepared: 07/19/2012 Analyzed: 07/21/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg						
Butyl Benzyl Phthalate	330	U	330	ug/kg						
Carbazole	330	U	330	ug/kg						
Chrysene	330	U	330	ug/kg						
Dibenz[a,h]anthracene	330	U	330	ug/kg						
Dibenzofuran	330	U	330	ug/kg						
Diethyl Phthalate	330	U	330	ug/kg						
Dimethyl Phthalate	330	U	330	ug/kg						
Di-n-butyl Phthalate	330	U	330	ug/kg						
Di-n-octyl Phthalate	330	U	330	ug/kg						
Fluoranthene	330	U	330	ug/kg						
Fluorene	330	U	330	ug/kg						
Hexachlorobenzene	330	U	330	ug/kg						
Hexachlorobutadiene	330	U	330	ug/kg						
Hexachlorocyclopentadiene	330	U	330	ug/kg						
Hexachloroethane	330	U	330	ug/kg						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg						
Isophorone	330	U	330	ug/kg						
Naphthalene	330	U	330	ug/kg						
Nitrobenzene	330	U	330	ug/kg						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg						
N-Nitrosodiphenylamine	330	U	330	ug/kg						
Pentachlorophenol	1650	U	1650	ug/kg						
Phenanthrene	330	U	330	ug/kg						
Phenol	330	U	330	ug/kg						
Pyrene	330	U	330	ug/kg						
Unknown 1 TICs	4680	J		ug/kg						
Aldol Condensate 2	32900	A, J		ug/kg						
Aldol Condensate 4	3830	A, J		ug/kg						
Aldol Condensate 3 BW 7/27/12	1730	A, J		ug/kg						
Aldol Condensate 1	1840	A, J		ug/kg						
Surrogate: 2-Fluorophenol	*1600*			*ug/kg*	*2500.0*		*64*	*25-121*		
Surrogate: Phenol-d5	*1690*			*ug/kg*	*2500.0*		*68*	*24-113*		
Surrogate: Nitrobenzene-d5	*681*			*ug/kg*	*1666.7*		*41*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C									
Blank (L207112-BLK1)			Prepared: 07/19/2012 Analyzed: 07/21/2012						
Surrogate: 2-Fluorobiphenyl	*1150*		*ug/kg*	*1666.7*		*69*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1040*		*ug/kg*	*2500.0*		*42*	*19-122*		
Surrogate: p-Terphenyl-d14	*1320*		*ug/kg*	*1666.7*		*79*	*18-137*		
LCS (L207112-BS1)			Prepared: 07/19/2012 Analyzed: 07/23/2012						
1,2,4-Trichlorobenzene	1270		ug/kg	2000.0		64	45-110		
1,2-Dichlorobenzene	1280		ug/kg	2000.0		64	45-105		
1,3-Dichlorobenzene	1220		ug/kg	2000.0		61	40-100		
1,4-Dichlorobenzene	1230		ug/kg	2000.0		62	35-105		
2,4,5-Trichlorophenol	1460		ug/kg	2000.0		73	30-140		
2,4,6-Trichlorophenol	1060		ug/kg	2000.0		53	20-110		
2,4-Dichlorophenol	1380		ug/kg	2000.0		69	40-110		
2,4-Dimethylphenol	1230		ug/kg	2000.0		62	30-105		
2,4-Dinitrophenol	308		ug/kg	2000.0		15*	25-130		
2,4-Dinitrotoluene	1410		ug/kg	2000.0		70	50-115		
2,6-Dinitrotoluene	1480		ug/kg	2000.0		74	40-120		
2-Chloronaphthalene	1330		ug/kg	2000.0		67	45-115		
2-Chlorophenol	1350		ug/kg	2000.0		68	45-105		
2-Methylnaphthalene	1270		ug/kg	2000.0		64	45-110		
2-Methylphenol	1500		ug/kg	2000.0		75	40-120		
2-Nitroaniline	1530		ug/kg	2000.0		76	45-120		
2-Nitrophenol	1310		ug/kg	2000.0		66	40-110		
3,3'-Dichlorobenzidine	1340		ug/kg	2000.0		67	15-130		
3-Nitroaniline	1450		ug/kg	2000.0		73	40-130		
4,6-Dinitro-2-methylphenol	525		ug/kg	2000.0		26	20-140		
4-Bromophenyl Phenyl Ether	1590		ug/kg	2000.0		80	45-115		
4-Chloro-3-methylphenol	1480		ug/kg	2000.0		74	35-115		
4-Chloroaniline	1160		ug/kg	2000.0		58	10-100		
4-Chlorophenyl Phenyl Ether	1410		ug/kg	2000.0		70	45-110		
3- and/or 4-Methylphenol	1520		ug/kg	2000.0		76	40-120		
4-Nitroaniline	1510		ug/kg	2000.0		76	40-130		
4-Nitrophenol	1140		ug/kg	2000.0		57	15-140		
Acenaphthene	1320		ug/kg	2000.0		66	45-110		
Acenaphthylene	1170		ug/kg	2000.0		58	45-115		
Anthracene	1400		ug/kg	2000.0		70	45-130		
Benz[a]anthracene	1480		ug/kg	2000.0		74	45-130		
Benzo[a] pyrene	1490		ug/kg	2000.0		74	45-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C									
LCS (L207112-BS1)			Prepared: 07/19/2012 Analyzed: 07/23/2012						
Benzo[b] fluoranthene	1500		ug/kg	2000.0		75	40-130		
Benzo[g,h,i] perylene	1610		ug/kg	2000.0		81	45-125		
Benzo[k] fluoranthene	1460		ug/kg	2000.0		73	45-125		
Bis(2-chloroethoxy) methane	1310		ug/kg	2000.0		65	45-110		
Bis(2-chloroethyl) ether	1290		ug/kg	2000.0		64	40-110		
Bis(2-chloroisopropyl) ether	1300		ug/kg	2000.0		65	30-115		
Bis(2-ethylhexyl) phthalate	1310		ug/kg	2000.0		66	40-145		
Butyl Benzyl Phthalate	1310		ug/kg	2000.0		66	50-125		
Carbazole	1520		ug/kg	2000.0		76	40-140		
Chrysene	1520		ug/kg	2000.0		76	45-130		
Dibenz[a,h]anthracene	1480		ug/kg	2000.0		74	45-125		
Dibenzofuran	1380		ug/kg	2000.0		69	45-120		
Diethyl Phthalate	1340		ug/kg	2000.0		67	50-125		
Dimethyl Phthalate	1350		ug/kg	2000.0		68	45-130		
Di-n-butyl Phthalate	1240		ug/kg	2000.0		62	50-130		
Di-n-octyl Phthalate	1220		ug/kg	2000.0		61	40-150		
Fluoranthene	1370		ug/kg	2000.0		69	45-130		
Fluorene	1370		ug/kg	2000.0		68	45-120		
Hexachlorobenzene	1660		ug/kg	2000.0		83	45-130		
Hexachlorobutadiene	1440		ug/kg	2000.0		72	45-105		
Hexachlorocyclopentadiene	472		ug/kg	2000.0		24	10-100		
Hexachloroethane	1230		ug/kg	2000.0		62	35-110		
Indeno[1,2,3-cd]pyrene	1620		ug/kg	2000.0		81	45-130		
Isophorone	1230		ug/kg	2000.0		61	40-110		
Naphthalene	1360		ug/kg	2000.0		68	40-110		
Nitrobenzene	1250		ug/kg	2000.0		63	40-105		
N-Nitrosodi-n-propylamine	1850		ug/kg	2000.0		92	30-130		
N-Nitrosodiphenylamine	1480		ug/kg	2000.0		74	50-120		
Pentachlorophenol	693		ug/kg	2000.0		35	25-120		
Phenanthrene	1450		ug/kg	2000.0		72	50-120		
Phenol	1450		ug/kg	2000.0		73	40-115		
Pyrene	1430		ug/kg	2000.0		71	45-125		
Surrogate: 2-Fluorophenol	*1700*		*ug/kg*	*2500.0*		*68*	*25-121*		
Surrogate: Phenol-d5	*1850*		*ug/kg*	*2500.0*		*74*	*24-113*		
Surrogate: Nitrobenzene-d5	*1100*		*ug/kg*	*1666.7*		*66*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1140*		*ug/kg*	*1666.7*		*68*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1280*		*ug/kg*	*2500.0*		*51*	*19-122*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
LCS (L207112-BS1)				Prepared: 07/19/2012 Analyzed: 07/23/2012						
Surrogate: p-Terphenyl-d14	*1250*			*ug/kg*	*1666.7*		*75*	*18-137*		
Matrix Spike (L207112-MS2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/25/2012						
1,2,4-Trichlorobenzene	1550	D		ug/kg	1981.5	13100 U	78	45-110		
1,2-Dichlorobenzene	1400	D		ug/kg	1981.5	13100 U	71	45-105		
1,3-Dichlorobenzene	1230	D		ug/kg	1981.5	13100 U	62	40-100		
1,4-Dichlorobenzene	1320	D		ug/kg	1981.5	13100 U	67	35-105		
2,4,5-Trichlorophenol	1520	D		ug/kg	1981.5	13100 U	77	30-140		
2,4,6-Trichlorophenol	883	D		ug/kg	1981.5	13100 U	45	20-110		
2,4-Dichlorophenol	1340	D		ug/kg	1981.5	13100 U	68	40-110		
2,4-Dimethylphenol	1490	D		ug/kg	1981.5	13100 U	75	30-105		
2,4-Dinitrophenol	0.00	U		ug/kg	1981.5	65700 U	*	25-130		
2,4-Dinitrotoluene	1040	D		ug/kg	1981.5	13100 U	53	50-115		
2,6-Dinitrotoluene	1210	D		ug/kg	1981.5	13100 U	61	40-120		
2-Chloronaphthalene	1580	D		ug/kg	1981.5	13100 U	80	45-115		
2-Chlorophenol	1500	D		ug/kg	1981.5	13100 U	76	45-105		
2-Methylnaphthalene	2010	D		ug/kg	1981.5	13100 U	102	45-110		
2-Methylphenol	1010	D		ug/kg	1981.5	13100 U	51	40-120		
2-Nitroaniline	1410	D		ug/kg	1981.5	65700 U	71	45-120		
2-Nitrophenol	1030	D		ug/kg	1981.5	13100 U	52	40-110		
3,3'-Dichlorobenzidine	524	D		ug/kg	1981.5	26300 U	26	15-130		
3-Nitroaniline	767	D		ug/kg	1981.5	65700 U	39*	40-130		
4,6-Dinitro-2-methylphenol	0.00	U		ug/kg	1981.5	13100 U	*	20-140		
4-Bromophenyl Phenyl Ether	1870	D		ug/kg	1981.5	13100 U	94	45-115		
4-Chloro-3-methylphenol	1890	D		ug/kg	1981.5	13100 U	95	35-115		
4-Chloroaniline	946	D		ug/kg	1981.5	13100 U	48	10-100		
4-Chlorophenyl Phenyl Ether	1570	D		ug/kg	1981.5	13100 U	79	45-110		
3- and/or 4-Methylphenol	2510	D		ug/kg	1981.5	13100 U	127*	40-120		
4-Nitroaniline	848	D		ug/kg	1981.5	65700 U	43	40-130		
4-Nitrophenol	0.00	U		ug/kg	1981.5	65700 U	*	15-140		
Acenaphthene	1720	D		ug/kg	1981.5	13100 U	87	45-110		
Acenaphthylene	1520	D		ug/kg	1981.5	13100 U	77	45-115		
Anthracene	2150	D		ug/kg	1981.5	13100 U	109	45-130		
Benz[a]anthracene	5010	D		ug/kg	1981.5	3830	60	45-130		
Benzo[a] pyrene	5080	D		ug/kg	1981.5	4180	46	45-130		
Benzo[b] fluoranthene	4750	D		ug/kg	1981.5	3650	56	40-130		
Benzo[g,h,i] perylene	4320	D		ug/kg	1981.5	2750	79	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
Matrix Spike (L207112-MS2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/25/2012						
Benzo[k] fluoranthene	4790	D		ug/kg	1981.5	3790	50	45-125		
Bis(2-chloroethoxy) methane	1640	D		ug/kg	1981.5	13100 U	83	45-110		
Bis(2-chloroethyl) ether	1630	D		ug/kg	1981.5	13100 U	82	40-110		
Bis(2-chloroisopropyl) ether	1730	D		ug/kg	1981.5	13100 U	87	30-115		
Bis(2-ethylhexyl) phthalate	5150	D		ug/kg	1981.5	4060	55	40-145		
Butyl Benzyl Phthalate	2590	D		ug/kg	1981.5	13100 U	130*	50-125		
Carbazole	1800	D		ug/kg	1981.5	13100 U	91	40-140		
Chrysene	7590	D		ug/kg	1981.5	5850	88	45-130		
Dibenz[a,h]anthracene	2430	D		ug/kg	1981.5	13100 U	123	45-125		
Dibenzofuran	1660	D		ug/kg	1981.5	13100 U	84	45-120		
Diethyl Phthalate	1510	D		ug/kg	1981.5	13100 U	76	50-125		
Dimethyl Phthalate	1480	D		ug/kg	1981.5	13100 U	75	45-130		
Di-n-butyl Phthalate	1750	D		ug/kg	1981.5	13100 U	89	50-130		
Di-n-octyl Phthalate	1290	D		ug/kg	1981.5	13100 U	65	40-150		
Fluoranthene	5540	D		ug/kg	1981.5	2580	150*	45-130		
Fluorene	1620	D		ug/kg	1981.5	13100 U	82	45-120		
Hexachlorobenzene	2060	D		ug/kg	1981.5	13100 U	104	45-130		
Hexachlorobutadiene	1540	D		ug/kg	1981.5	13100 U	78	45-105		
Hexachlorocyclopentadiene	0.00	U		ug/kg	1981.5	13100 U	*	10-100		
Hexachloroethane	802	D		ug/kg	1981.5	13100 U	40	35-110		
Indeno[1,2,3-cd]pyrene	4010	D		ug/kg	1981.5	2760	63	45-130		
Isophorone	1510	D		ug/kg	1981.5	13100 U	76	40-110		
Naphthalene	1940	D		ug/kg	1981.5	13100 U	98	40-110		
Nitrobenzene	1420	D		ug/kg	1981.5	13100 U	72	40-105		
N-Nitrosodi-n-propylamine	1930	D		ug/kg	1981.5	13100 U	97	30-130		
N-Nitrosodiphenylamine	1810	D		ug/kg	1981.5	13100 U	91	50-120		
Pentachlorophenol	0.00	U		ug/kg	1981.5	65700 U	*	25-120		
Phenanthrene	5020	D		ug/kg	1981.5	13100 U	253*	50-120		
Phenol	1980	D		ug/kg	1981.5	13100 U	100	40-115		
Pyrene	9720	D		ug/kg	1981.5	4860	245*	45-125		
Surrogate: 2-Fluorophenol	*2010*			*ug/kg*	*2476.9*		*81*	*25-121*		
Surrogate: Phenol-d5	*2160*			*ug/kg*	*2476.9*		*87*	*24-113*		
Surrogate: Nitrobenzene-d5	*1150*			*ug/kg*	*1651.3*		*70*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1390*			*ug/kg*	*1651.3*		*84*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*525*			*ug/kg*	*2476.9*		*21*	*19-122*		
Surrogate: p-Terphenyl-d14	*1910*			*ug/kg*	*1651.3*		*116*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
Matrix Spike Dup (L207112-MSD2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/25/2012						
1,2,4-Trichlorobenzene	1460	D		ug/kg	1966.6	13100 U	74	45-110	5	40
1,2-Dichlorobenzene	1380	D		ug/kg	1966.6	13100 U	70	45-105	0.9	40
1,3-Dichlorobenzene	1230	D		ug/kg	1966.6	13100 U	62	40-100	0.5	40
1,4-Dichlorobenzene	1340	D		ug/kg	1966.6	13100 U	68	35-105	2	40
2,4,5-Trichlorophenol	1370	D		ug/kg	1966.6	13100 U	70	30-140	10	40
2,4,6-Trichlorophenol	858	D		ug/kg	1966.6	13100 U	44	20-110	2	40
2,4-Dichlorophenol	1160	D		ug/kg	1966.6	13100 U	59	40-110	14	40
2,4-Dimethylphenol	1370	D		ug/kg	1966.6	13100 U	70	30-105	8	40
2,4-Dinitrophenol	0.00	U		ug/kg	1966.6	65700 U	*	25-130		40
2,4-Dinitrotoluene	890	D		ug/kg	1966.6	13100 U	45*	50-115	15	40
2,6-Dinitrotoluene	993	D		ug/kg	1966.6	13100 U	50	40-120	19	40
2-Chloronaphthalene	1440	D		ug/kg	1966.6	13100 U	73	45-115	9	40
2-Chlorophenol	1350	D		ug/kg	1966.6	13100 U	69	45-105	10	40
2-Methylnaphthalene	1910	D		ug/kg	1966.6	13100 U	97	45-110	4	40
2-Methylphenol	970	D		ug/kg	1966.6	13100 U	49	40-120	3	40
2-Nitroaniline	1370	D		ug/kg	1966.6	65700 U	70	45-120	2	40
2-Nitrophenol	876	D		ug/kg	1966.6	13100 U	45	40-110	15	40
3,3'-Dichlorobenzidine	592	D		ug/kg	1966.6	26300 U	30	15-130	13	40
3-Nitroaniline	790	D		ug/kg	1966.6	65700 U	40	40-130	4	40
4,6-Dinitro-2-methylphenol	0.00	U		ug/kg	1966.6	13100 U	*	20-140		40
4-Bromophenyl Phenyl Ether	1580	D		ug/kg	1966.6	13100 U	80	45-115	16	40
4-Chloro-3-methylphenol	1760	D		ug/kg	1966.6	13100 U	90	35-115	6	40
4-Chloroaniline	994	D		ug/kg	1966.6	13100 U	51	10-100	6	40
4-Chlorophenyl Phenyl Ether	1410	D		ug/kg	1966.6	13100 U	72	45-110	10	40
3- and/or 4-Methylphenol	2530	D		ug/kg	1966.6	13100 U	129*	40-120	1	40
4-Nitroaniline	843	D		ug/kg	1966.6	65700 U	43	40-130	0.2	40
4-Nitrophenol	0.00	U		ug/kg	1966.6	65700 U	*	15-140		40
Acenaphthene	1590	D		ug/kg	1966.6	13100 U	81	45-110	7	40
Acenaphthylene	1500	D		ug/kg	1966.6	13100 U	76	45-115	1	40
Anthracene	2850	D		ug/kg	1966.6	13100 U	145*	45-130	29	40
Benz[a]anthracene	9280	D		ug/kg	1966.6	3830	277*	45-130	129*	40
Benzo[a] pyrene	8020	D		ug/kg	1966.6	4180	195*	45-130	124*	40
Benzo[b] fluoranthene	7510	D		ug/kg	1966.6	3650	196*	40-130	111*	40
Benzo[g,h,i] perylene	5410	D		ug/kg	1966.6	2750	135*	45-125	52*	40
Benzo[k] fluoranthene	7890	D		ug/kg	1966.6	3790	209*	45-125	122*	40
Bis(2-chloroethoxy) methane	1550	D		ug/kg	1966.6	13100 U	79	45-110	5	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/27/2012 15:19

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 L207112 - SW 3540C										
Matrix Spike Dup (L207112-MSD2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/25/2012						
Bis(2-chloroethyl) ether	1550	D		ug/kg	1966.6	13100 U	79	40-110	5	40
Bis(2-chloroisopropyl) ether	1630	D		ug/kg	1966.6	13100 U	83	30-115	5	40
Bis(2-ethylhexyl) phthalate	4700	D		ug/kg	1966.6	4060	33*	40-145	50*	40
Butyl Benzyl Phthalate	2400	D		ug/kg	1966.6	13100 U	122	50-125	7	40
Carbazole	1820	D		ug/kg	1966.6	13100 U	92	40-140	2	40
Chrysene	13300	D		ug/kg	1966.6	5850	381*	45-130	125*	40
Dibenz[a,h]anthracene	3220	D		ug/kg	1966.6	13100 U	164*	45-125	29	40
Dibenzofuran	1550	D		ug/kg	1966.6	13100 U	79	45-120	6	40
Diethyl Phthalate	1360	D		ug/kg	1966.6	13100 U	69	50-125	9	40
Dimethyl Phthalate	1400	D		ug/kg	1966.6	13100 U	71	45-130	5	40
Di-n-butyl Phthalate	1690	D		ug/kg	1966.6	13100 U	86	50-130	3	40
Di-n-octyl Phthalate	1120	D		ug/kg	1966.6	13100 U	57	40-150	13	40
Fluoranthene	11300	D		ug/kg	1966.6	2580	441*	45-130	99*	40
Fluorene	1610	D		ug/kg	1966.6	13100 U	82	45-120	0.2	40
Hexachlorobenzene	1690	D		ug/kg	1966.6	13100 U	86	45-130	19	40
Hexachlorobutadiene	1440	D		ug/kg	1966.6	13100 U	73	45-105	6	40
Hexachlorocyclopentadiene	0.00	U		ug/kg	1966.6	13100 U	*	10-100		40
Hexachloroethane	743	D		ug/kg	1966.6	13100 U	38	35-110	7	40
Indeno[1,2,3-cd]pyrene	5490	D		ug/kg	1966.6	2760	139*	45-130	75*	40
Isophorone	1350	D		ug/kg	1966.6	13100 U	68	40-110	10	40
Naphthalene	1760	D		ug/kg	1966.6	13100 U	89	40-110	9	40
Nitrobenzene	1200	D		ug/kg	1966.6	13100 U	61	40-105	16	40
N-Nitrosodi-n-propylamine	1690	D		ug/kg	1966.6	13100 U	86	30-130	12	40
N-Nitrosodiphenylamine	1570	D		ug/kg	1966.6	13100 U	80	50-120	14	40
Pentachlorophenol	0.00	U		ug/kg	1966.6	65700 U	*	25-120		40
Phenanthrene	5860	D		ug/kg	1966.6	13100 U	298*	50-120	16	40
Phenol	1950	D		ug/kg	1966.6	13100 U	99	40-115	1	40
Pyrene	17100	D		ug/kg	1966.6	4860	622*	45-125	87*	40
Surrogate: 2-Fluorophenol	*1820*			*ug/kg*	*2458.2*		*74*	*25-121*		
Surrogate: Phenol-d5	*1970*			*ug/kg*	*2458.2*		*80*	*24-113*		
Surrogate: Nitrobenzene-d5	*978*			*ug/kg*	*1638.8*		*60*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1170*			*ug/kg*	*1638.8*		*72*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*607*			*ug/kg*	*2458.2*		*25*	*19-122*		
Surrogate: p-Terphenyl-d14	*1500*			*ug/kg*	*1638.8*		*92*	*18-137*		

PREPARATION BENCH SHEET

L207112

Lionville Laboratory

Printed: 7/20/2012 2:03:16PM

000000029

Matrix: Solid **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1200845**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1207019-01	8270C TCL SVOC	07/19/2012 15:44	30.12	1				500	WC-Hanford, Inc.	
1207032-01	8270C TCL SVOC	07/19/2012 15:44	30.13	4				500	WC-Hanford, Inc.	
L207112-BLK1	QC	07/19/2012 15:44	30	1				500		
L207112-BS1	QC	07/19/2012 15:44	30	1	1200337		600	500		
L207112-MS1	QC	07/19/2012 15:44	30.76	1	1200337	1207019-01	600	500		
L207112-MS2	QC	07/19/2012 15:44	30.28	4	1200337	1207032-01	600	500		
L207112-MSD1	QC	07/19/2012 15:44	29.22	1	1200337	1207019-01	600	500		
L207112-MSD2	QC	07/19/2012 15:44	30.51	4	1200337	1207032-01	600	500		

Extracts Relinquished By 7/20/12 1404 Date

Extracts Received By 7/20/12 1408 Date

PCBS

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 14:01

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NKR6	1207032-01	Other Solid	07/12/2012 10:40	07/14/2012 11:00

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
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Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-040 K3951
LVL #: 1207032

W.O. #: 60049-001-001-0001-00
Received: 07-14-2012

PCBs

One (1) other solid sample was collected on 07-12-2012.

The sample and associated QC samples were extracted 07-19-2012 and analyzed 07-23,24-2012 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. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.

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

3. The sample was extracted with a reduced initial volume due to limited sample volume. Reporting limits have been adjusted to reflect the necessary changes.

4. All obtainable surrogate recoveries were within acceptance criteria.

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

6. All blank spike recoveries were within acceptance criteria.

7. One (1) of four (4) matrix spike recoveries was outside acceptance criteria. The elevated spike recovery of Aroclor 1260 in the MS2 is due to high concentration of Aroclor 1260 in the non-spiked sample.

8. The sample was reported on a wet weight 'as received' 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.

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

7/27/12
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.

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WC-Hanford, Inc.	Project: RC-040	
2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	07/25/2012 14:01

J1NKR6
1207032-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1221	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1232	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1242	**13.3**	**J**	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1248	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1254	**200**		25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1260	**83.8**		25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1262	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Aroclor 1268	25.4	U	25.4	ug/kg	1	L207111	07/19/2012	07/24/2012	8082
Surrogate: Decachlorobiphenyl	*60 %*		*43-144*			*L207111*	*07/19/2012*	*07/24/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*65 %*		*52-141*			*L207111*	*07/19/2012*	*07/24/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 14:01

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 L207111 - SW 3540C										
Blank (L207111-BLK1)				Prepared: 07/19/2012 Analyzed: 07/23/2012						
Aroclor 1016	13.3	U	13.3	ug/kg						
Aroclor 1221	13.3	U	13.3	ug/kg						
Aroclor 1232	13.3	U	13.3	ug/kg						
Aroclor 1242	13.3	U	13.3	ug/kg						
Aroclor 1248	13.3	U	13.3	ug/kg						
Aroclor 1254	13.3	U	13.3	ug/kg						
Aroclor 1260	13.3	U	13.3	ug/kg						
Aroclor 1262	13.3	U	13.3	ug/kg						
Aroclor 1268	13.3	U	13.3	ug/kg						
Surrogate: Decachlorobiphenyl	*26.3*			*ug/kg*	*33.333*		*79*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*27.9*			*ug/kg*	*33.337*		*84*	*52-141*		
LCS (L207111-BS1)				Prepared: 07/19/2012 Analyzed: 07/23/2012						
Aroclor 1016	104		13.3	ug/kg	166.67		62	50-138		
Aroclor 1260	117		13.3	ug/kg	166.67		70	50-148		
Surrogate: Decachlorobiphenyl	*22.8*			*ug/kg*	*33.333*		*68*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*25.5*			*ug/kg*	*33.337*		*76*	*52-141*		
Matrix Spike (L207111-MS2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/24/2012						
Aroclor 1016	255		26.6	ug/kg	333.11	25.4 U	77	50-138		
Aroclor 1260	746		26.6	ug/kg	333.11	83.8	199*	50-148		
Surrogate: Decachlorobiphenyl	*48.6*			*ug/kg*	*66.622*		*73*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*52.8*			*ug/kg*	*66.629*		*79*	*52-141*		
Matrix Spike Dup (L207111-MSD2)		**Source: 1207032-01**		Prepared: 07/19/2012 Analyzed: 07/24/2012						
Aroclor 1016	252		25.3	ug/kg	317.26	25.4 U	79	50-138	3	40
Aroclor 1260	337		25.3	ug/kg	317.26	83.8	80	50-148	85*	40
Surrogate: Decachlorobiphenyl	*44.0*			*ug/kg*	*63.452*		*69*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*48.9*			*ug/kg*	*63.458*		*77*	*52-141*		

PREPARATION BENCH SHEET

L207111

Lionville Laboratory

Printed: 7/20/2012 2:02:49PM

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 120050

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1207019-01	8082 PCBs	07/19/2012 15:27	30.79	10				250	WC-Hanford, Inc.	
1207032-01	8082 PCBs	07/19/2012 15:27	15.73	10				250	WC-Hanford, Inc.	
L207111-BLK1	QC	07/19/2012 15:27	30	10				250		
L207111-BS1	QC	07/19/2012 15:27	30	10	1200123		250	250		
L207111-MS1	QC	07/19/2012 15:27	30.07	10	1200123	1207019-01	250	250		
L207111-MS2	QC	07/19/2012 15:27	15.01	10	1200123	1207032-01	250	250		
L207111-MSD1	QC	07/19/2012 15:27	30.17	10	1200123	1207019-01	250	250		
L207111-MSD2	QC	07/19/2012 15:27	15.76	10	1200123	1207032-01	250	250		

S cleaned 7/23/12 LK
Cu Lot # G16W031

Extracts Relinquished By 7/20/12 Date 1402

LK Extracts Received By 7/23/12 Date

METALS

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-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 11:44

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NKR6	1207032-01	Other Solid	07/12/2012 10:40	07/14/2012 11:00

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-040
LVL#: 1207032
SDG/SAF#: K3951/RC-040

W.O.#: 60049-001-001-0001-00
Date Received: 07-14-12

METALS

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

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

1. This narrative covers the analysis of 1 other solid sample.

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

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, samples were 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 6 analytes were outside the 75-125% control limits.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed on Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

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.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1NKR6	Cadmium	100	123.1
	Chromium	1,100	86.7
	Lead	1,100	92.2
	Selenium	100	120.8
	Silver	100	113.3
	Mercury	1	113

12. The duplicate analyses for 5 analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Selenium was 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

7/26/12
Date

rgc/07-0032hgn%

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-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 11:44

Notes and Definitions

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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 11:44

J1NKR6
1207032-01 (Other Solid)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Metals by SW846 6000/7000 series								
Arsenic	**4.24**	0.735	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Barium	**63.2**	0.368	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Cadmium	**1.37**	0.147	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Chromium	**196**	0.221	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Lead	**280**	0.368	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Selenium	**0.828**	0.735	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Silver	**6.60**	0.147	mg/kg wet	1	L207109	07/20/2012	07/23/2012	6010B
Mercury	**0.632**	0.0237	mg/kg	1	L207095	07/18/2012	07/20/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 11:44

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 L207095 - SW 7471A Prep										
Blank (L207095-BLK1)				Prepared: 07/18/2012 Analyzed: 07/20/2012						
Mercury	0.0281	U	0.0281	mg/kg						
Duplicate (L207095-DUP3)		**Source: 1207032-01**		Prepared: 07/18/2012 Analyzed: 07/20/2012						
Mercury	0.477		0.0243	mg/kg		0.632			27.9*	20
Matrix Spike (L207095-MS3)		**Source: 1207032-01**		Prepared: 07/18/2012 Analyzed: 07/20/2012						
Mercury	0.507		0.0237	mg/kg	0.13158	0.632	-95.0*	75-125		
Reference (L207095-SRM1)				Prepared: 07/18/2012 Analyzed: 07/20/2012						
Mercury	1.29		0.0300	mg/kg	1.2900		100	62.6-138		
Batch L207109 - SW 3050B										
Blank (L207109-BLK1)				Prepared: 07/20/2012 Analyzed: 07/23/2012						
Arsenic	0.962	U	0.962	mg/kg wet						
Barium	0.481	U	0.481	mg/kg wet						
Cadmium	0.192	U	0.192	mg/kg wet						
Chromium	0.288	U	0.288	mg/kg wet						
Lead	0.481	U	0.481	mg/kg wet						
Selenium	0.962	U	0.962	mg/kg wet						
Silver	0.192	U	0.192	mg/kg wet						
Duplicate (L207109-DUP2)		**Source: 1207032-01**		Prepared: 07/20/2012 Analyzed: 07/23/2012						
Arsenic	4.56		0.725	mg/kg wet		4.24			7.23	20
Barium	69.4		0.362	mg/kg wet		63.2			9.32	20
Cadmium	5.15		0.145	mg/kg wet		1.37			116*	20
Chromium	76.6		0.217	mg/kg wet		196			87.6*	20
Lead	87.2		0.362	mg/kg wet		280			105*	20
Selenium	0.650	B	0.725	mg/kg wet		0.828			24.1*	20
Silver	22.4		0.145	mg/kg wet		6.60			109*	20

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-040 Project Number: K3951 Project Manager: Joan Kessner	**Reported:** 07/25/2012 11:44

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 L207109 - SW 3050B									
Matrix Spike (L207109-MS2)		**Source: 1207032-01**	Prepared: 07/20/2012 Analyzed: 07/23/2012						
Arsenic	129	0.725	mg/kg wet	144.93	4.24	86.0	75-125		
Barium	190	0.362	mg/kg wet	144.93	63.2	87.2	75-125		
Cadmium	3.97	0.145	mg/kg wet	3.6232	1.37	71.7*	75-125		
Chromium	103	0.217	mg/kg wet	14.493	196	-645*	75-125		
Lead	67.3	0.362	mg/kg wet	36.232	280	-586*	75-125		
Selenium	104	0.725	mg/kg wet	144.93	0.828	71.0*	75-125		
Silver	7.86	0.145	mg/kg wet	3.6232	6.60	34.7*	75-125		
Reference (L207109-SRM1)			Prepared: 07/20/2012 Analyzed: 07/23/2012						
Arsenic	113	2.88	mg/kg wet	114.00		99.0	82.8-117.54		
Barium	315	1.44	mg/kg wet	307.00		103	79.8-120.2		
Cadmium	225	0.577	mg/kg wet	225.00		100	83.6-116.4		
Chromium	78.4	0.865	mg/kg wet	77.200		102	73.3-126.4		
Lead	179	1.44	mg/kg wet	190.00		94.1	81.6-118.4		
Selenium	186	2.88	mg/kg wet	187.00		99.5	75.9-124.6		
Silver	82.6	0.577	mg/kg wet	83.500		98.9	82.7-117.1		

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L207109
Date/Time Initiated: 7/19/12-7/20/12 ~~1550~~ 0900 MW 7/20/12
Date/Time Completed: 7/20/12 1550
Analyst: MW
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 #: BM
Balance Cal Verification: Y NA
Temp: 95
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
1207030-01		0.65	50			coarse	dark brown/sludge	rock	
L207109-DUP1		0.67	50			↓	↓	↓	
MS1	0.5	0.65	50			↓	↓	↓	
1207032-01		0.68	50			coarse	black/sludge	metal	
L207109-DUP2		0.69	50			↓	↓	↓	
MS2	0.5	0.69	50			↓	↓	↓	
BLK1		0.52	50			coarse	white/boiling chips		
SRM1		0.52	50			fine	pink/granular		

MW 7/19/12

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: 1101357

Reagent IDs:
HNO_3 L08023
HCl L01031
H_2O_2 K09A03
1:1 HNO_3 657-066-02
1:1 HCl

File ID#:

Data Review By/Date:
Rec 7/23/12

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

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: MMLL
Date 7/18/12 - 7/19/12
Start Time/Temp: 1400/96°
End Time/Temp: 1430/97°

Instrument ID: HG3.2
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1143
Prep Batch: L207095
Worksheet: HG072002
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 µg/l		0.100		10 ml	50	
1.0 µg/l		0.500		10 ml	50	
2.0 µg/l		1.000		10 ml	50	
5.0 µg/l		2.500		10 ml	50	
10.0 µg/l		5.000		10 ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L207095-BLK1				0.32	50	
SRM1		(*)	(*)	0.30	50	
1207020-09				0.32	50	
L207095-DUP1				0.33	50	
MS1		0.500	1.0	0.33	50	
1207030-01				0.36	50	
L207095-DUP2				0.36	50	
MS2		0.500	1.0	0.35	50	
1207032-01				0.38	50	
L207095-DUP3				0.37	50	
MS3		0.500	1.0	0.38	50	
1207034-01				0.35	50	
L207095-DUP4				0.35	50	
MS4		0.500	1.0	0.36	50	
1207034-02				0.37	50	
03				0.36	50	
04				0.37	50	
05				0.34	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	7/19/12 1030
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: RBO 7/24/12

se book # 1143 pg 1 for std traceability information

Soil LCS True Value = 1.75 mg/Kg
Standard # 1101357 (*)

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

ME-HgCVAA-Prep0910

Page #:

000000047
AAAAAAA19

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 7/18/12-7/19/12
Start Time/Temp: 0119
End Time/Temp: See SS

Instrument ID: HG3.2
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1143
Prep Batch: L207095
Worksheet: HG072002
SOP No. ME-HgCVAA
BLOCK 1 (3) 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.
1207034-06				0.34	50	
07				0.39	50	
08				0.34	50	
09				0.33	50	
10				0.37	50	
11				0.36	50	
12				0.38	50	
13				0.33	50	
14				0.35	50	
15				0.34	50	

[illegible] 7/18/12

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

Soil LCS True Value = See page 019 mg/Kg
Standard # _____

Reviewed By/Date: [illegible]

se book # 1143 p1 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

000000048

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

14 August 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 #	1207032
SDG #	K3951 ADD-ON
SAF #	RC-040
Date Received	07/14/12
# Samples	1
Matrix	OTHER SOLID
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

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 17 pages.

CHAIN OF CUSTODY

*** REVISION ***

Lionville Laboratory Use Only: 1207032

Custody Transfer Record/Lab Work Request

Lionville Laboratory
A Division of Eberline Analytical Corporation

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: W.C. Hanford SAF# RC-040
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: Orletta Johnson
QC: SW Del: Std. TAT: 15 days

Date Rec'd: 7-14-12 Date Due: 7-29-12

		A	B
Refrigerator #		2	2
#/Type Container	Liquid		
	Solid	1qal	1qal
Volume	Liquid		
	Solid	250	250
Preservatives		—	—

ANALYSES REQUESTED → ORGANIC: VOA, BNA, ~~Pest~~/PCB, Herb; INORG: Metal + Hg, CN

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	Lionville Laboratory Use Only: VOA	BNA (8270)	Pest/PCB (8082)	Herb				Metal + Hg	CN	TCLP metals					
01	JINKRL	✓	✓	SO	7.12.12	1040		X	X					X		X					

Special Instructions:
O Met = RCRA list

Special Instructions:
7/16/12 RS 1. Analyze solids only per client COC
2.
7/31/12 3. TCLP metals added per client 7 day TAT; due 8/7
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[signature]	7.14.12	11:00

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-040-746	Page 1 of 1

Collector: RL STRICKLAND	Company Contact: Tom Edmundson	Telephone No.: 509.947.5192	Project Coordinator: KESSNER, JH
Price Code: 9K	Data Turnaround: 15 Days		
Project Designation: 300 Area D4 Waste Characterization Sampling - Other Solid	Sampling Location: SMS 7-12-12 ~~3906~~, 3906A, ~~3906B~~ Sediment		SAF No.: RC-040
Ice Chest No.: WCH-11-038	Field Logbook No.: SMS EL-1518-~~28~~ 26 7-12-12	COA: RD4MXX2F00	Method of Shipment: FEDEX
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A110406		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

Cool 4 degrees C

Preservation	Cool 4C	Cool 4C	Cool 4C	None	None						
Type of Container	G/P	aG	aG	G/P	G/P						
No. of Container(s)	1	1	0	1	0						
Volume	250mL	250mL	60mL	500mL	60mL						
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	PCBs - 8082	See item (2) in Special Instructions.	Gross Alpha & Gross Beta						

Sample No.	Matrix *	Sample Date	Sample Time										
J1NKR6	OTHER SOLID	07/12/12	1040	✓	✓	✓							
J1NKR7	OTHER SOLID												
J1NKR8	OTHER SOLID	SMS 7-12-12											
J1NKR9	OTHER SOLID												

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
RL Strickland WCH	07/12/12 1400	FED EX	
FED EX	7-14-12 11:00	DSH-19	7-14-12/11:00

SPECIAL INSTRUCTIONS

(1) Metals - TC Primary Constituents {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Metals - TC Primary Constituents {Mercury}
(2) Gamma Spec (Client List) {Americium-241, Antimony-125, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228}

*Please analyze solids only.

REVIEWED BY SMS
DATE 7/12/12

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

00000004

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford
Project/SAF/SOW/Release #: RC-040

Date: 7-14-12

LvL Batch #: 1207032

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7986 1445 6921
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** 8.2	°C	Cooler # WCH-11-038
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 See #5	
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 See #5	
16. Project Manager contacted concerning any discrepancies?	☑ Yes	☐ No	☐ N/A
Person Contacted OJ		Date 7-14-12	

SR-002-B.doc

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

WC-Hanford, Inc.	Project: RC-040	
2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/06/2012 11:21

Analytical Report for TCLP Metals by SW846 1311 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NKR6	1207032-01	Other Solid	07/12/2012 10:40	07/14/2012 11:00

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-040
LVL#: 1207032
SDG/SAF#: K3951/RC-040

W.O.#: 60049-001-001-0001-00
Date Received: 07-14-12

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.

1. This narrative covers the analysis of 1 TCLP leachate sample.

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

   The TCLP leachate sample was analyzed with a 5-fold dilution 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 (less than the LOQ).

7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation, MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}.

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

9. All laboratory control samples (LCS) were within the 80-120% control limits.

10. All 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.

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. The TCLP extract from sample J1NKR6 was selected for the matrix spike (MS) for this analytical batch.

    The MS recoveries for all analytes in the TCLP extract were above 50% .

    The matrix spike (MS) concentration for Mercury was equivalent to the regulatory level (200 ppb) as per SW846 method 1311. The required spike concentration is above the linear range of the instrument, resulting in a 50-fold dilution. The MS recovery was greater than 50% as per method criteria.

12. 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.

13. 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.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

8/9/12
Date

alm/07-032

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

WC-Hanford, Inc.	Project: RC-040	
2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/06/2012 11:21

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	08/06/2012 11:21

J1NKR6
1207032-01 (Other Solid)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Metals by SW846 1311 6000/7000 series									
Arsenic	0.0750	U	0.0750	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Barium	**0.158**		0.00500	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Cadmium	0.0150	U	0.0150	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Chromium	**0.0222**	B	0.0250	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Lead	0.0500	U	0.0500	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Selenium	0.100	U	0.100	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Silver	0.0300	U	0.0300	mg/L	5	L208004	08/02/2012	08/03/2012	6010
Mercury	0.000200	U	0.000200	mg/L	1	L208007	08/02/2012	08/03/2012	7470

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2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/06/2012 11:21

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 L208004 - SW 3010A										
Blank (L208004-BLK1)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
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 (L208004-BLK2)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
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	0.00301	B	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 (L208004-BS1)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
Arsenic	10.0		0.0150	mg/L	10.000		100	80-120		
Barium	5.02		0.00100	mg/L	5.0000		100	80-120		
Cadmium	0.259		0.00300	mg/L	0.25000		104	80-120		
Chromium	0.527		0.00500	mg/L	0.50000		105	80-120		
Lead	2.54		0.0100	mg/L	2.5000		101	80-120		
Selenium	9.84		0.0200	mg/L	10.000		98.4	80-120		
Silver	0.505		0.00600	mg/L	0.50000		101	80-120		
Duplicate (L208004-DUP1)		**Source: 1207032-01**		Prepared: 08/02/2012 Analyzed: 08/03/2012						
Arsenic	0.0112	B	0.0750	mg/L		0.0750 U				20
Barium	0.150		0.00500	mg/L		0.158			5.02	20
Cadmium	0.0150	U	0.0150	mg/L		0.0150 U				20
Chromium	0.0210	B	0.0250	mg/L		0.0222			5.72	20
Lead	0.0500	U	0.0500	mg/L		0.0500 U				20
Selenium	0.0154	B	0.100	mg/L		0.100 U				20
Silver	0.0300	U	0.0300	mg/L		0.0300 U				20

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WC-Hanford, Inc.	Project: RC-040	
2620 Fermi Avenue	Project Number: K3951	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	08/06/2012 11:21

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 L208004 - SW 3010A										
Matrix Spike (L208004-MS1)		**Source: 1207032-01**		Prepared: 08/02/2012 Analyzed: 08/03/2012						
Arsenic	5.30		0.0750	mg/L	5.0000	0.0750 U	106	50-1000		
Barium	97.3		0.00500	mg/L	100.00	0.158	97.1	50-1000		
Cadmium	1.06		0.0150	mg/L	1.0000	0.0150 U	106	50-1000		
Chromium	4.99		0.0250	mg/L	5.0000	0.0222	99.3	50-1000		
Lead	4.87		0.0500	mg/L	5.0000	0.0500 U	97.4	50-1000		
Selenium	1.05		0.100	mg/L	1.0000	0.100 U	105	50-1000		
Silver	4.38		0.0300	mg/L	5.0000	0.0300 U	87.7	50-1000		
Batch L208007 - SW 7470A Prep										
Blank (L208007-BLK1)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
Mercury	0.000200	U	0.000200	mg/L						
Blank (L208007-BLK2)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
Mercury	0.000200	U	0.000200	mg/L						
LCS (L208007-BS1)				Prepared: 08/02/2012 Analyzed: 08/03/2012						
Mercury	0.00535		0.000200	mg/L	0.0050000		107	80-120		
Duplicate (L208007-DUP1)		**Source: 1207032-01**		Prepared: 08/02/2012 Analyzed: 08/03/2012						
Mercury	0.000200	U	0.000200	mg/L		0.000200 U				20
Matrix Spike (L208007-MS1)		**Source: 1207032-01**		Prepared: 08/02/2012 Analyzed: 08/03/2012						
Mercury	0.208		0.0100	mg/L	0.20000	0.000200 U	104	50-1000		

Lionville Laboratory

Logbook #: 1128

SAMPLE DIGESTION RECORD

Digestion Batch #: L208004
Date/Time Initiated: 8/2/12 1100
Date/Time Completed: 8/2/12 1830
Analyst: MW
Matrix (circle): Soil Water Other (TCLP leachates)
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
1207032-01		50	50		TC		yellowish / clear		
L208004-DUP1		50	50						
MS1	0.5	50	50						
1207047-01		10	50				yellow / cloudy	dilution due to somewhat limited volume	
L208004-DUP2		10	50						
MS2	0.1	10	50						
1207052-01		50	50				slightly yellow / clear		RAD
L208004-DUP3		50	50						
MS3	0.5	50	50				amber / rusty particulates		
1207052-02		50	50				clear / colorless		
~~DUP~~ 1207053-01		50	50				amber / clear		
L208004-DUP4		50	50						
MS4	0.5	50	50				/ rusty particulates		
1207058-01		10	~~10~~ 50				slightly yellow / clear		
L208004-DUP5		10	~~10~~ 50						
MS5	0.1	10	~~10~~ 50						
BLK1		50	50				clear / colorless		
(*) BLK2		50	50						
(*) BLK3		50	50						
(*) BLK4		50	50						
BS1	0.5	50	50						

MW 8/2/12

Spiking IDs / Expiration Date:
MS#: 1101384
1200459
LCS#: 1200458

Reagent IDs:
HNO_3 L08023
HCl
H_2O_2
1:1 HNO_3
1:1 HCl 637-069-01

File ID#:

Data Review By/Date: QM 8/6/12

(*) BLK2 = L207155-BLK1 (for 1207032, 1207058)
BLK3 = L207155-BLK1 (for 1207047, 1207053)
BLK4 = L207179-BLK1 (for 1207052)

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Signed\SPI\Metals Digestion log.doc

Page #:

PREPARATION BENCH SHEET

L208004

Lionville Laboratory

Printed: 8/2/2012 7:12:58PM

Matrix: Solid **Prepared using: METALS - SW 3010A** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1207032-01	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	50	50					WC-Hanford, Inc.	
1207047-01	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	10	50					WC-Hanford, Inc.	
1207052-01	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	50	50					Navarro Research & Engineering, Inc.	
1207052-02	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	50	50					Navarro Research & Engineering, Inc.	
1207053-01	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	50	50					ANR Pipeline	
1207058-01	1311/6010B TCLP RCRA ICP MET	08/02/2012 10:40	10	50					Teledyne Brown Engineering	
L208004-BLK1	QC	08/02/2012 10:40	50	50						
L208004-BLK2	QC	08/02/2012 10:40	50	50						L207185-for 1207032/1207058
L208004-BLK3	QC	08/02/2012 10:40	50	50						L207155-for1207047/1207053
L208004-BLK4	QC	08/02/2012 10:40	50	50						L207179-for 1207052
L208004-BS1	QC	08/02/2012 10:40	50	50	1200458					
L208004-DUP1	QC	08/02/2012 10:40	50	50		1207032-01				
L208004-DUP2	QC	08/02/2012 10:40	10	50		1207047-01				
L208004-DUP3	QC	08/02/2012 10:40	50	50		1207052-01				
L208004-DUP4	QC	08/02/2012 10:40	50	50		1207053-01				
L208004-DUP5	QC	08/02/2012 10:40	10	50		1207058-01				
L208004-MS1	QC	08/02/2012 10:40	50	50	1101384	1207032-01	500			
L208004-MS2	QC	08/02/2012 10:40	10	50	1101384	1207047-01	100			
L208004-MS3	QC	08/02/2012 10:40	50	50	1101384	1207052-01	500			
L208004-MS4	QC	08/02/2012 10:40	50	50	1101384	1207053-01	500			

Extracts Relinquished By — Date: 8/2/12

Extracts Received By — Date: 08/03/12

PREPARATION BENCH SHEET

L208004

Lionville Laboratory

Printed: 8/2/2012 7:12:58PM

Matrix: Solid **Prepared using: METALS - SW 3010A** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
L208004-MS5	QC	08/02/2012 10:40	10	50	1101384	1207058-01	100			

Extracts Relinquished By — Date: 8/2/12

Extracts Received By — Date: 08/03/12

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1143

Analyst: [illegible]
Date 8/2/12
Start Time/Temp: 1430/93°
End Time/Temp: 1640/96°

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

Prep Batch: L208007
Worksheet: HG080301
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				35	35	
0.2 ug/l		0.070		35	35	
1.0 ug/l		0.350		35	35	
2.0 ug/l		0.700		35	35	
5.0 ug/l		1.750		35	35	
10.0 ug/l		3.500		35	35	
ICV		0.0875	2.5	35	35	
CCV		0.175	5.0	35	35	
ICB/CCB				35	35	
L208007-BLK1				35	35	
BS1		0.175	5.0	35	35	
BLK2	<			35	35	L207185
BLK3	<			35	35	L207179
1207032-01	<			35	35	
L208007-DUP1	<			35	35	
MS1		0.700	200 *	35	35	
1207052-01	<			35	35	RAD
L208007-DUP2	<	0.700		35	35	
MS2		~~0.070~~ w.c. pw 8/2/12	200 *	35	35	
1207052-02	<			35	35	
1207058-01	<			3.5	35	RAD dilution due to
L208007-DUP3	<			3.5	35	high RAD level
MS3		0.070	20 (200) *	3.5	35	
		pw 8/2/12				

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200388	8/2/12 1130
ICV/CCV/LCS	(IV. 1200532)	N/A

Reviewed By/Date: [illegible] 8/6/12

se book # 1143 pg 1 for std traceability information

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

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

ME-HgCVAA-Prep0910

* used 1200587 (10 ug/ml)

Page #:

000000016

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1116

Start Date: 8-1-12 Start Time: 14:25 Analyst: RH SOP: SPI-1311.1	End Date: 8-2-12 End Time: 8:00 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L207185 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria: 23°C ± 2°**

LvL #: 1207032-01 Client ID#: JINKR6 pH After 5 Min: 7.66 pH After Acid/Heat: 1.97 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 25 Extract Fluid Vol.(mL): 500 pH After Extraction: 5.15	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
LvL #: 1207058-01 Client ID#: L51243-1 pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 2.7 Extract Fluid Vol.(mL): 54 pH After Extraction: N/A	Initial Filtration Data and Comments: Solids: _____% / NA * RAD III Initial Filtrate Added: _____
LvL # L207185 Client ID#: pH After 5 Min: N/A pH After Acid/Heat: Extraction Fluid/pH: N/A Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA Include pH. ALM 8/6/12 BLANK Initial Filtrate Added: _____
LvL #: Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: RH Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA RH Initial Filtrate Added: _____

Standard	ID	Prep Date	Expir Date	pH Acceptance Criteria
Fluid #1	1200956	7-30-12	1-30-12	4.93 ± 0.05
Fluid # 2				2.88 ± 0.05

SPI-1311.1-A-0310 Reviewed By/Date ALM 8/6/12 Page #