SAF-RC-228
340 Building Geoprobe and Test-Pit Sampling
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 5/16/12
INITIAL/DATE

COMMENTS:

SDG K3873 SAF-RC-228

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Sample Location: 340 Complex – Test Pits

EBERLINE SERVICES

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May 1, 2012

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

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-04-078-7665 SDG K3873

Dear Ms. Kessner:

Enclosed is the data report for one soil sample designated under SAF No. RC-228. The sample was received at Eberline Analytical on April 19, 2012. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Joseph Verville
Client Services Manager

NJV/mw

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3873 was composed of one soil sample designated under SAF No. RC-228 with a Project Designation of: 340 Building Geoprobe and Test-Pit Sampling.

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 May 1, 2012.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis, Low Level

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analysis

The relative percent difference between the original and duplicate Pu-238 results was 64% and the DER was 1.3; results for both the original and duplicate analyses were less than the RDL. No other problems were encountered during the course of the analyses.

2.4 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**	5/1/12 **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 K3873

SDG	7665
Contact	Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K3873

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	Hanford1
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	05/01/12

SDG 7665
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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 Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/01/12

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 K3873

SDG 7665
Contact Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S204078-01	J1P0W3	340 Complex - Test Pits	SOIL		RC-228	RC-228-024	04/17/12 13:17
S204078-02	Lab Control Sample		SOIL		RC-228		
S204078-03	Method Blank		SOIL		RC-228		
S204078-04	Duplicate (S204078-01)	340 Complex - Test Pits	SOIL		RC-228		04/17/12 13:17

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

SDG 7665
Contact Joseph Verville

QC SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

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
7665	RC-228-024	J1P0W3	SOIL	94.3	1410 g		04/19/12	2	S204078-01	7665-001
		Method Blank	SOIL						S204078-03	7665-003
		Lab Control Sample	SOIL						S204078-02	7665-002
		Duplicate (S204078-01)	SOIL	94.3	1410 g		04/19/12	2	S204078-04	7665-004

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

SDG 7665
Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
PU	SOIL	Plutonium, Isotopic in Solids	7320-136	8.0	1			1	1	1/1		
Beta Counting												
SR	SOIL	Total Strontium in Solids	7320-136	10.4	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOIL	Gamma Scan	7320-136	7.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOIL	Tritium in Solids	7320-136	10.0	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 Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

SDG 7665
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S204078-01	J1P0W3			7665-001	GAM		04/25/12	04/26/12	CSS	Gamma Scan
04/17/12	340 Complex - Test Pits		SOIL	7665-001	H		04/26/12	04/26/12	BW	Tritium in Solids
04/19/12	RC-228-024	RC-228		7665-001	PU		04/28/12	04/30/12	BW	Plutonium, Isotopic in Solids
				7665-001	SR		04/26/12	04/30/12	BW	Total Strontium in Solids
S204078-02	Lab Control Sample			7665-002	GAM		04/25/12	04/26/12	CSS	Gamma Scan
			SOIL	7665-002	H		04/26/12	04/26/12	BW	Tritium in Solids
		RC-228		7665-002	PU		04/28/12	04/30/12	BW	Plutonium, Isotopic in Solids
				7665-002	SR		04/26/12	04/30/12	BW	Total Strontium in Solids
S204078-03	Method Blank			7665-003	GAM		04/26/12	04/26/12	CSS	Gamma Scan
			SOIL	7665-003	H		04/26/12	04/26/12	BW	Tritium in Solids
		RC-228		7665-003	PU		04/28/12	04/30/12	BW	Plutonium, Isotopic in Solids
				7665-003	SR		04/26/12	04/30/12	BW	Total Strontium in Solids
S204078-04	Duplicate (S204078-01)			7665-004	GAM		04/26/12	04/26/12	CSS	Gamma Scan
04/17/12	340 Complex - Test Pits		SOIL	7665-004	H		04/26/12	04/26/12	BW	Tritium in Solids
04/19/12		RC-228		7665-004	PU		04/28/12	04/30/12	BW	Plutonium, Isotopic in Solids
				7665-004	SR		04/26/12	04/30/12	BW	Total Strontium in Solids

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	RC-228	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	RC-228	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1	4
PU	RC-228	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	RC-228	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TOTALS				4			4	4	4	16

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

7665-003 Method Blank

METHOD BLANK

SDG	7665	Client/Case no	Hanford SDG_K3873
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S204078-03	Client sample id	Method Blank
Dept sample id	7665-003	Material/Matrix	SOIL
		SAF No	RC-228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.183	3.6	6.13	10.0	U	H
Total Strontium	SR-RAD	-0.099	0.13	0.285	1.00	U	SR
Plutonium 238	13981-16-3	-0.019	0.038	0.146	1.00	U	PU
Plutonium 239/240	PU-239/240	0.019	0.038	0.146	1.00	U	PU
Potassium 40	13966-00-2	U		0.134		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Niobium 94	14681-63-1	U		0.009		U	GAM
Cesium 137	10045-97-3	U		0.009	0.100	U	GAM
Cerium 144	14762-78-8	U		0.037		U	GAM
Europium 152	14683-23-9	U		0.025	0.100	U	GAM
Europium 154	15585-10-1	U		0.028	0.100	U	GAM
Europium 155	14391-16-3	U		0.020	0.100	U	GAM
Radium 226	13982-63-3	U		0.018	0.100	U	GAM
Radium 228	15262-20-1	U		0.039	0.200	U	GAM
Thorium 228	14274-82-9	U		0.015		U	GAM
Thorium 232	TH-232	U		0.039		U	GAM
Uranium 235	15117-96-1	U		0.048	0.300	U	GAM
Uranium 238	U-238	U		1.01	10.0	U	GAM
Americium 241	14596-10-2	U		0.012	0.300	U	GAM
Zinc 65	13982-39-3	U		0.019		U	GAM
Ruthenium 106	13967-48-1	U		0.067		U	GAM
Antimony 125	14234-35-6	U		0.020		U	GAM
Bismuth 214	14733-03-0	U		0.019		U	GAM
Lead 212	15092-94-1	U		0.016		U	GAM

QC-BLANK #81598

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

7665-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7665

Contact Joseph Verville

Client/Case no Hanford SDG K3873

Contract No. S00W235A01

Lab sample id S204078-02

Dept sample id 7665-002

Client sample id Lab Control Sample

Material/Matrix SOIL

SAF No RC-228

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	247	10	5.62	10.0		H	246	9.8	100	83-117	80-120
Total Strontium	8.23	0.46	0.211	1.00		SR	8.49	0.34	97	82-118	80-120
Plutonium 238	12.9	1.4	0.175	1.00		PU	13.6	0.54	95	80-120	80-120
Plutonium 239/240	15.5	1.6	0.175	1.00		PU	15.8	0.63	98	80-120	80-120
Cobalt 60	0.312	0.026	0.013	0.050		GAM	0.339	0.014	92	84-116	80-120
Cesium 137	0.388	0.023	0.014	0.100		GAM	0.385	0.015	101	85-115	80-120

QC-LCS #81597

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

7665-004 J1P0W3

DUPLICATE

SDG	7665			Client/Case no	Hanford SDG K3873
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S204078-04	Lab sample id	S204078-01	Client sample id	J1P0W3
Dept sample id	7665-004	Dept sample id	7665-001	Location/Matrix	340 Complex - Test Pits SOIL
		Received	04/19/12	Collected/Weight	04/17/12 13:17 1410 g
% solids	94.3	% solids	94.3	Custody/SAF No	RC-228-024 RC-228

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	-0.849	2.2	3.80	10.0	U	H	1.01	2.2	3.77	U	-		1.2
Total Strontium	1.01	0.20	0.224	1.00		SR	0.864	0.18	0.215		16	48	1.0
Plutonium 238	0.130	0.078	0.099	1.00		PU	0.253	0.17	0.161		64	148	1.3
Plutonium 239/240	0.052	0.052	0.099	1.00	U	PU	0	0.042	0.161	U	-		1.6
Potassium 40	12.6	0.58	0.246			GAM	13.2	0.60	0.247		5	18	0.8
Cobalt 60	U		0.029	0.050	U	GAM	U		0.030	U	-		0
Niobium 94	U		0.025		U	GAM	U		0.024	U	-		0.1
Cesium 137	9.30	0.12	0.040	0.100		GAM	9.40	0.12	0.044		1	15	0.2
Cerium 144	U		0.178		U	GAM	U		0.178	U	-		0
Europium 152	U		0.122	0.100	U	GAM	U		0.125	U	-		0
Europium 154	U		0.099	0.100	U	GAM	U		0.100	U	-		0
Europium 155	U		0.110	0.100	U	GAM	U		0.110	U	-		0
Radium 226	0.363	0.066	0.072	0.100		GAM	0.385	0.074	0.078		6	42	0.4
Radium 228	0.564	0.097	0.096	0.200		GAM	0.576	0.11	0.106		2	41	0.2
Thorium 228	0.602	0.067	0.079			GAM	0.509	0.039	0.050		17	26	2.0
Thorium 232	0.564	0.097	0.096			GAM	0.576	0.11	0.106		2	41	0.2
Uranium 235	U		0.215	0.300	U	GAM	U		0.220	U	-		0
Uranium 238	U		3.34	10.0	U	GAM	U		3.25	U	-		0
Americium 241	0.233	0.11	0.163	0.300		GAM	0.327	0.13	0.177		34	92	1.1
Zinc 65	U		0.066		U	GAM	U		0.070	U	-		0.1
Ruthenium 106	U		0.316		U	GAM	U		0.306	U	-		0
Antimony 125	U		0.130		U	GAM	U		0.137	U	-		0.1
Bismuth 214	0.374	0.068	0.074			GAM	0.397	0.076	0.080		6	42	0.4
Lead 212	0.621	0.069	0.082			GAM	0.525	0.040	0.051		17	26	2.0

QC-DUP#1 81599

340 Building Geoprobe and Test-Pit Sampling

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

7665-001 J1P0W3

DATA SHEET

SDG	7665	Client/Case no	Hanford	SDG_K3873	
Contact	Joseph Verville	Contract	No. S00W235A01		
Lab sample id	S204078-01	Client sample id	J1P0W3		
Dept sample id	7665-001	Location/Matrix	340 Complex - Test Pits	SOIL	
Received	04/19/12	Collected/Weight	04/17/12 13:17	1410 g	
% solids	94.3	Custody/SAF No	RC-228-024	RC-228	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	1.01	2.2	3.77	10.0	U	H
Total Strontium	SR-RAD	0.864	0.18	0.215	1.00		SR
Plutonium 238	13981-16-3	0.253	0.17	0.161	1.00		PU
Plutonium 239/240	PU-239/240	0	0.042	0.161	1.00	U	PU
Potassium 40	13966-00-2	13.2	0.60	0.247			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Niobium 94	14681-63-1	U		0.024		U	GAM
Cesium 137	10045-97-3	9.40	0.12	0.044	0.100		GAM
Cerium 144	14762-78-8	U		0.178		U	GAM
Europium 152	14683-23-9	U		0.125	0.100	U	GAM
Europium 154	15585-10-1	U		0.100	0.100	U	GAM
Europium 155	14391-16-3	U		0.110	0.100	U	GAM
Radium 226	13982-63-3	0.385	0.074	0.078	0.100		GAM
Radium 228	15262-20-1	0.576	0.11	0.106	0.200		GAM
Thorium 228	14274-82-9	0.509	0.039	0.050			GAM
Thorium 232	TH-232	0.576	0.11	0.106			GAM
Uranium 235	15117-96-1	U		0.220	0.300	U	GAM
Uranium 238	U-238	U		3.25	10.0	U	GAM
Americium 241	14596-10-2	0.327	0.13	0.177	0.300		GAM
Zinc 65	13982-39-3	U		0.070		U	GAM
Ruthenium 106	13967-48-1	U		0.306		U	GAM
Antimony 125	14234-35-6	U		0.137		U	GAM
Bismuth 214	14733-03-0	0.397	0.076	0.080			GAM
Lead 212	15092-94-1	0.525	0.040	0.051			GAM

340 Building Geoprobe and Test-Pit Sampling

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

Test	PU
Matrix	SOIL
SDG	7665
Contact	Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3873

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238	Plutonium 239/240	
Preparation batch 7320-136							
S204078-01			7665-001	J1P0W3	0.253	U	
S204078-02			7665-002	Lab Control Sample	ok	ok	
S204078-03			7665-003	Method Blank	U	U	
S204078-04			7665-004	Duplicate (S204078-01)	ok	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX 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 7320-136			2σ prep error 8.0 %	Reference Lab Notebook No. 7301 pg. 61												
S204078-01			J1P0W3	0.161	0.500			83		139			11	04/27/12	04/28	SS-008
S204078-02			Lab Control Sample	0.175	0.500			79		138				04/27/12	04/28	SS-009
S204078-03			Method Blank	0.146	0.500			89		138				04/27/12	04/28	SS-011
S204078-04			Duplicate (S204078-01)	0.099	0.500			83		229			11	04/27/12	04/28	SS-015
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA	0.145 ±	0.066
FOR 4 SAMPLES	YIELD	84 ±	8

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

Test SR	Matrix SOIL
SDG 7665	
Contact Joseph Verville	

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford	
Contract No. S00W235A01	
Contract SDG K3873	

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7320-136					
S204078-01			7665-001	J1P0W3	0.864
S204078-02			7665-002	Lab Control Sample	ok
S204078-03			7665-003	Method Blank	U
S204078-04			7665-004	Duplicate (S204078-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	1.00

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 7320-136			2σ prep error 10.4 % Reference Lab Notebook No. 7301 pg. 61													
S204078-01			J1P0W3	0.215	1.00			91		120			9	04/26/12	04/26	GRB-222
S204078-02			Lab Control Sample	0.211	1.00			93		120				04/26/12	04/26	GRB-223
S204078-03			Method Blank	0.285	1.00			92		100				04/26/12	04/26	GRB-223
S204078-04			Duplicate (S204078-01)	0.224	1.00			96		120			9	04/26/12	04/26	GRB-224
Nominal values and limits from method				1.00	1.00			40-110		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	SPP-061	Determination of Moisture Content in Solid Samples rev 0
	SPP-060	Soil Preparation, rev 0
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.234	±	0.069
YIELD	93	±	4

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

Test GAM Matrix SOIL
SDG 7665
Contact Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K3873

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7320-136						
S204078-01			7665-001	J1P0W3	U	9.40
S204078-02			7665-002	Lab Control Sample	ok	ok
S204078-03			7665-003	Method Blank	U	U
S204078-04			7665-004	Duplicate (S204078-01)	- 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 7320-136			2σ prep error 7.0 % Reference Lab Notebook No. 7301 pg. 61													
S204078-01			J1P0W3	0.030	764					114			8	04/23/12	04/25	02,04,00
S204078-02			Lab Control Sample	0.013	764					169				04/23/12	04/25	01,04,00
S204078-03			Method Blank	0.010	764					117				04/23/12	04/26	01,03,00
S204078-04			Duplicate (S204078-01)	0.029	764					117			9	04/23/12	04/26	02,04,00
Nominal values and limits from method				0.050	764					100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.020 ± 0.021
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/01/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3873

Test H	Matrix SOIL
SDG 7665	
Contact Joseph Verville	

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract No. S00W235A01	
Contract SDG K3873	

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7320-136						
S204078-01			7665-001	J1P0W3	U	
S204078-02			7665-002	Lab Control Sample	ok	
S204078-03			7665-003	Method Blank	U	
S204078-04			7665-004	Duplicate (S204078-01)	-	U
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	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7320-136			2σ prep error 10.0 % Reference Lab Notebook No. 7301 pg. 61													
S204078-01			J1P0W3	3.77	0.621			100		50			9	04/25/12	04/26	LSC-004
S204078-02			Lab Control Sample	5.62	0.321			100		50				04/25/12	04/26	LSC-004
S204078-03			Method Blank	6.13	0.321			100		50				04/25/12	04/26	LSC-004
S204078-04			Duplicate (S204078-01)	3.80	0.624			100		50			9	04/25/12	04/26	LSC-004
Nominal values and limits from method				10.0	0.321					50			180			

PROCEDURES	REFERENCE	TRITIUM_COX_LSC
	CP-251	Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD	MDA	4.83	± 2.45
FOR 4 SAMPLES	YIELD	100	± 0

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/01/12

SDG 7665
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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 Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/01/12

SDG 7665
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

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 Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/01/12

SDG 7665
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

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.

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REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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 Hanford1
Version Ver 1.0
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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 7665
Contact Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG K3873

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.

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REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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.

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Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/01/12

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REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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 Hanford1
Version Ver 1.0
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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 7665
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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
Protocol Hanford1
Version Ver 1.0
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SDG 7665
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GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG_K3873

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.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/01/12

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'

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-228-024	Page ~~2 of 2~~ 1 OF 1

Collector M. Simonds	**Company Contact** Joan Kessner	**Telephone No.** 509.375.4688	**Project Coordinator** KESSNER, JH
Project Designation 340 Building Geoprobe and Test-Pit Sampling	**Sampling Location** 340 Complex -- Test Pits K3873 (7665)		**SAF No.** RC-228
Ice Chest No. WCH- 11-020	**Field Logbook No.** EL-1663-01	**COA** R340CX2600	**Method of Shipment** FedEx/Hand Deliver
Shipped To EBERLINE SERVICES / ~~LIONVILLE~~ 4/17/12	**Offsite Property No.** ~~NA~~ AJ 4-17-12 A110319		**Bill of Lading/Air Bill No.** ~~NA~~ AJ 4-17-12 See OSPC

Price Code 8L **Data Turnaround** 4/17/12 **21 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS
Potential Radioactive < DOT Limits AJ 4-18-12

Special Handling and/or Storage
~~Cool 4C~~ None AJ 4-17-12

Preservation	None	None	None	None	None	None					
Type of Container	aG	G/P	G/P	G	G/P	Snap Lid					
No. of Container(s)	1	1	1	1	1	1					
Volume	120mL	1000mL	60mL	60mL	60mL	60g					
SAMPLE ANALYSIS	TCLP Semi-VOA - 1311/8270A	See item (1) in Special Instructions.	Isotopic Plutonium	Tritium - H3 Low Level Soil	Strontium-89,90 -- Total Sr	RCF GEA Shipping Screen					

Sample No.	Matrix *	Sample Date	Sample Time										RCF
J1P0W3	SOIL	4/17/12	1317		✓	✓	✓	✓					32835

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS MLS	4-17-12 1355	DAVID BECKER	4/17/12 1355
DAVID BECKER	4/17/12 1519	1060 #2 A. Freier	1519 4-17-12
WCH A. Freier	1140 1060 #2 4-18-12	Fed Ex	
FED EX		Alex Kelenson KELENSON	4/19/12 10:00

SPECIAL INSTRUCTIONS
~~Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further direction is provided.~~ 4/17/12

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

REVIEWED BY CMB DATE 4-18-12

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

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 4/19/12 10:00 CoC No. RC-228-024

Container I.D. No. WCH-11-020 Requested TAT (Days) 21 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [ ] N/A ✓
6. Number of samples in shipping container: 1 Sample Matrix SOIL
7. Number of containers per sample: 4 (Or see CoC _____)
8. Samples are in correct container Yes [✓] No [ ]
9. Paperwork agrees with samples? Yes [✓] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]
11. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH _____ Preservative _____
13. Describe any anomalies:
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by JK Date: 4/19/12 Time: 13:20

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J1P0W3	<80						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 6 Dec 2011

Form SCP-02, 07-30-07

"over 55 years of quality nuclear services"

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

10 May 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 #	1204070
SDG #	K3873
SAF #	RC-228
Date Received	04/19/12
# Samples	1
Matrix	SOIL
Volatiles	X
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
PAHs	X
Herbicides	
Metals	X
Inorganics	X

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

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 110 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1204070

Custody Transfer Record/Lab Work Request

X Revisions X

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client W.C. Hanford SAF# RC-228

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Charlotte Johnson

QC SW Del STD TAT 21 days

Date Rec'd 4-19-12 Date Due 5-10-12

Refrigerator # 4-19-12

		A-D	E	F	G	H	I	J	K	L	M	N		O		
		Food Bags	2	2	2	2	2	2	2	2	2	2		2		
#/Type Container	Liquid															
	Solid	4oz	1oz	1oz	1oz	1oz	1oz	1oz	1oz	1oz	1oz	1oz		1oz		
Volume	Liquid															
	Solid	40	60	60	120	60	120	60	60	60	120	60		40		
Preservatives		—	—	—	—	—	—	—	—	—	—	—		—		
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	~~Pest~~ PCB	TCLP ~~Herb~~ SVOA	PAHs 8310	TCLV	TPH-D	(1) Metal + Hg	CN SFD	(2) TCLP Metals + Hg	(3) ICP Anions NO2, NO3	P#	% Solid		
		Lionville Laboratory Use Only														
		8260	8270	8082	TCLP 8270	8310 PAH	TCLV 8260	DRO	Met(1)	cyanide SFD	TCLP RCRA	Anions N3N2	PH	% Moist		

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	8260	8270	8082	TCLP 8270	8310 PAH	TCLV 8260	DRO	Met(1)	cyanide SFD	TCLP RCRA	Anions N3N2	PH	% Moist		
01	J1POW3	✓	✓	S	4-17-12	1317	X	X	X	X	X	X	X	X		X	X	X	X		

Cancelled 5-11-12

Special Instructions:

Met(1) = HSL + B, Mo, Si (NO TL)

Special Instructions:

1. Leach and hold TCLP Metals until directed to
2. 5-11-12 Leachate metals are cancelled per Client.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	4-19-12	0935

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-228-024 | Page 1 of 2

Collector M. Simonds	**Company Contact** Joan Kessner	**Telephone No.** 509.375.4688	**Project Coordinator** KESSNER, JH
Price Code 8L	**Data Turnaround** 21 Days		
Project Designation 340 Building Geoprobe and Test-Pit Sampling	**Sampling Location** 340 Complex -- Test Pits		**SAF No.** RC-228
Ice Chest No. WCH-11-058	**Field Logbook No.** EL-1663-01	**COA** R340CX2600	**Method of Shipment** FedEx/Hand Deliver
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE KB 4/17/12	**Offsite Property No.** ~~NA~~ A# 4-17-12 A110292		**Bill of Lading/Air Bill No.** ~~NA~~ A# 4-17-12 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential~~ Radioactive < DOT Limits A# 4-18-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
Type of Container	G/P	G/P	G/P	G	G	G	aG	aG	aG	Gs*
No. of Container(s)	1	1	1	1	1	~~3~~ 5 KB 4/17/12	1	1	1	1
Volume	60mL	120mL	60mL	60mL	60mL	40mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Total Cyanide - 9010; Sulfides - 9030	TPH-Diesel Range - WTPH-D	VOA - 5035/8260 (TCL) *	Semi-VOA - 8270A (TCL)	PCBs - 8082	PAHs - 8310	TCLP VOA -- 1311/8260A

Sample No.	Matrix *	Sample Date	Sample Time										
J1P0W3	SOIL	4/17/12	1317	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

RCF 32835

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS	1355 4-17-12	DAVID BECKER	4/17/12 1355
DAVID BECKER	4/17/12 1519	1060#2 A. Freier	1519 4-17-12
A. Freier 1060#2	WCH 1140 4-18-12	Fed Ex	
	4.19.12 0935		4.19.12 0935

SPECIAL INSTRUCTIONS

Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further direction is provided.

(1) ICP Metals - 6010TR (Close-out List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV) {Mercury}
(2) Metals by ICP (TCLP) - 1311/6010 {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury (TCLP) - 1311/7470 {Mercury}
(3) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; pH (Soil) - 9045 {pH Measurement}

VOA samples frozen upon collection
* freeze upon receipt

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

REVIEWED BY CMB DATE 4-18-12

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

WCH-EE-011

00000004

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-228-024 | Page 2 of 2

Collector	M. Simonds
Company Contact	Joan Kessner
Telephone No.	509.375.4688
Project Coordinator	KESSNER, JH
Price Code	8L
Data Turnaround	21 Days
Project Designation	340 Building Geoprobe and Test-Pit Sampling
Sampling Location	340 Complex -- Test Pits
SAF No.	RC-228
Ice Chest No.	WCH-11-058
Field Logbook No.	EL-1663-01
COA	R340CX2600
Method of Shipment	FedEx/Hand Deliver
Shipped To	~~EBERLINE SERVICES~~ / LIONVILLE WDB 4/17/12
Offsite Property No.	~~NA~~ AJ 4-17-12 A110292
Bill of Lading/Air Bill No.	~~NA~~ AJ 4-17-12 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

Potential Radioactive & DOT Limits
AJ 4-18-12

Special Handling and/or Storage

Cool 4C

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	TCLP Semi-VOA - 1311/8270A	See item (1) in Special Instructions.	Isotopic Plutonium	Tritium - H3 Low Level Soil	Strontium-89,90 -- Total Sr	RCF GEA Shipping Screen				
Preservation				None	None	None	None	None	None				
Type of Container				aG	G/P	G/P	G	G/P	Snap Lid				
No. of Container(s)				1	1	1	1	1	1				
Volume				120mL	1000mL	60mL	60mL	60mL	60g				
J1P0W3	SOIL	4/17/12	1317	✓									RCF 32835

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIKE SIMONDS MS	4-17-12 1355	DAVID BECKER	4/17/12 1355
DAVID BECKER	4/17/12 1519	1060 #2 A. Freier	1519 4-17-12
A. Freier	LOCH 1060 #2 1140 4-18-12	Fed Ex	

SPECIAL INSTRUCTIONS

Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further direction is provided.

~~(1) Gamma Spec (Client List)~~ (Americium-241, Antimony-125, Cerium-144, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, ~~Radium-228, Ruthenium-106~~, Uranium-235, Uranium-238, Zinc-65) WDB 4/17/12

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

REVIEWED BY CMB DATE 4-18-12

WCH-EE-011

00000005

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAF/SOW/Release #: RC-228

Date: 4-19-12

LvL Batch #: 1204070

Sample Custodian: D. Yonier

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier FedEx		Airbill # 7983 0011 4510
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	Comments:
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 2.3	°C	Cooler # WCH-11-058
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify)
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no. then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

000000006

VOLATILES

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

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/26/2012 15:43

Analytical Report for Volatile Organic Compounds by SW846 8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Date Received: 04-19-2012

GC/MS VOLATILE

One (1) soil sample was collected on 04-17-2012.

The sample and associated QC samples were prepared and analyzed 04-19-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5035A and the analysis procedure was based on SW846 Method 8260B for TCL Volatile target compounds.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. Samples were analyzed within hold time.
3. Non-target compounds were not detected in these samples.
4. All obtainable surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank was below the reporting limit for all target analytes.
8. The sample is reported on a dry weight basis.
9. All internal standard area and retention time criteria were met.
10. All initial calibrations associated with this data set were within acceptance criteria.
11. 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.

12. Manual integrations are performed according to SOP QA-125 to produce quality data with utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

Iain Daniels
LvL Laboratory Manager

4/27/12
Date

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 concetration 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 quan 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 quan modifications:

MP	-	Missed Peak: Manually added peak not found by automatic quan program.
PA	-	Peak Assignment: quan 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 signal., or other interference.
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 15:43

J1P0W3
1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Volatile Organic Compounds by SW846 8260B									
1,1,1-Trichloroethane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,1,2,2-Tetrachloroethane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,1,2-Trichloroethane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,1-Dichloroethane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,1-Dichloroethene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,2-Dichloroethane	6.62	U	6.62	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,2-Dichloroethene (total)	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
1,2-Dichloropropane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
2-Butanone	13.2	U	13.2	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
2-Hexanone	13.2	U	13.2	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
4-Methyl-2-pentanone	13.2	U	13.2	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Acetone	13.2	U	13.2	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Benzene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Bromodichloromethane	6.62	U	6.62	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Bromoform	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Bromomethane	11.0	U	11.0	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Carbon Disulfide	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Carbon Tetrachloride	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Chlorobenzene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Chloroethane	11.0	U	11.0	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Chloroform	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Chloromethane	11.0	U	11.0	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
cis-1,2-Dichloroethene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
cis-1,3-Dichloropropene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Dibromochloromethane	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Ethylbenzene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Methylene Chloride	6.62	U	6.62	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Styrene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Tetrachloroethene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
trans-1,2-Dichloroethene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Toluene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
trans-1,3-Dichloropropene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Trichloroethene	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Vinyl chloride	11.0	U	11.0	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Xylenes, total	5.52	U	5.52	ug/kg dry	1	L204225	04/19/2012	04/19/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*120 %*		*60-130*			*L204225*	*04/19/2012*	*04/19/2012*	*8260B*

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

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/26/2012 15:43

J1P0W3

1204070-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*91 %*	*72-117*			*L204225*	*04/19/2012*	*04/19/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*108 %*	*72-144*			*L204225*	*04/19/2012*	*04/19/2012*	*8260B*

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2620 Fermi Avenue	Project Number: K3873	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/26/2012 15:43

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204225 - SW 5035A										
Blank (L204225-BLK1)				Prepared & Analyzed: 04/19/2012						
1,1,1-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1,2,2-Tetrachloroethane	5.00	U	5.00	ug/kg wet						
1,1,2-Trichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethane	5.00	U	5.00	ug/kg wet						
1,1-Dichloroethene	5.00	U	5.00	ug/kg wet						
1,2-Dichloroethane	6.00	U	6.00	ug/kg wet						
1,2-Dichloroethene (total)	5.00	U	5.00	ug/kg wet						
1,2-Dichloropropane	5.00	U	5.00	ug/kg wet						
2-Butanone	12.0	U	12.0	ug/kg wet						
2-Hexanone	12.0	U	12.0	ug/kg wet						
4-Methyl-2-pentanone	12.0	U	12.0	ug/kg wet						
Acetone	12.0	U	12.0	ug/kg wet						
Benzene	5.00	U	5.00	ug/kg wet						
Bromodichloromethane	6.00	U	6.00	ug/kg wet						
Bromoform	5.00	U	5.00	ug/kg wet						
Bromomethane	10.0	U	10.0	ug/kg wet						
Carbon Disulfide	5.00	U	5.00	ug/kg wet						
Carbon Tetrachloride	5.00	U	5.00	ug/kg wet						
Chlorobenzene	5.00	U	5.00	ug/kg wet						
Chloroethane	10.0	U	10.0	ug/kg wet						
Chloroform	5.00	U	5.00	ug/kg wet						
Chloromethane	10.0	U	10.0	ug/kg wet						
cis-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
cis-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Dibromochloromethane	5.00	U	5.00	ug/kg wet						
Ethylbenzene	5.00	U	5.00	ug/kg wet						
Methylene Chloride	6.00	U	6.00	ug/kg wet						
Styrene	5.00	U	5.00	ug/kg wet						
Tetrachloroethene	5.00	U	5.00	ug/kg wet						
trans-1,2-Dichloroethene	5.00	U	5.00	ug/kg wet						
Toluene	5.00	U	5.00	ug/kg wet						
trans-1,3-Dichloropropene	5.00	U	5.00	ug/kg wet						
Trichloroethene	5.00	U	5.00	ug/kg wet						
Vinyl chloride	10.0	U	10.0	ug/kg wet						
Xylenes, total	5.00	U	5.00	ug/kg wet						
Surrogate: 1,2-Dichloroethane-d4	*61.9*			*ug/kg wet*	*50.000*		*124*	*60-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 15:43

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204225 - SW 5035A									
Blank (L204225-BLK1)			Prepared & Analyzed: 04/19/2012						
Surrogate: Toluene-d8	*46.2*		*ug/kg wet*	*50.000*		*92*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*52.9*		*ug/kg wet*	*50.000*		*106*	*72-144*		
LCS (L204225-BS1)			Prepared & Analyzed: 04/19/2012						
1,1,1-Trichloroethane	56.4	5.00	ug/kg wet	50.000		113	65-130		
1,1,2,2-Tetrachloroethane	38.0	5.00	ug/kg wet	50.000		76	50-130		
1,1,2-Trichloroethane	41.4	5.00	ug/kg wet	50.000		83	60-125		
1,1-Dichloroethane	49.8	5.00	ug/kg wet	50.000		100	70-130		
1,1-Dichloroethene	48.4	5.00	ug/kg wet	50.000		97	60-130		
1,2-Dichloroethane	56.2	6.00	ug/kg wet	50.000		112	60-130		
1,2-Dichloroethene (total)	94.1	5.00	ug/kg wet	100.00		94	75-125		
1,2-Dichloropropane	47.8	5.00	ug/kg wet	50.000		96	70-130		
2-Butanone	38.2	12.0	ug/kg wet	50.000		76	20-200		
2-Hexanone	36.4	12.0	ug/kg wet	50.000		73	20-200		
4-Methyl-2-pentanone	37.7	12.0	ug/kg wet	50.000		75	40-150		
Acetone	35.7	12.0	ug/kg wet	50.000		71	15-240		
Benzene	43.8	5.00	ug/kg wet	50.000		88	75-125		
Bromodichloromethane	53.0	6.00	ug/kg wet	50.000		106	65-135		
Bromoform	44.6	5.00	ug/kg wet	50.000		89	60-130		
Bromomethane	50.1	10.0	ug/kg wet	50.000		100	40-150		
Carbon Disulfide	47.2	5.00	ug/kg wet	50.000		94	55-140		
Carbon Tetrachloride	57.5	5.00	ug/kg wet	50.000		115	60-135		
Chlorobenzene	43.8	5.00	ug/kg wet	50.000		88	70-125		
Chloroethane	47.8	10.0	ug/kg wet	50.000		96	50-150		
Chloroform	53.6	5.00	ug/kg wet	50.000		107	70-130		
Chloromethane	47.6	10.0	ug/kg wet	50.000		95	40-130		
cis-1,2-Dichloroethene	45.9	5.00	ug/kg wet	50.000		92	70-125		
cis-1,3-Dichloropropene	43.4	5.00	ug/kg wet	50.000		87	70-125		
Dibromochloromethane	46.2	5.00	ug/kg wet	50.000		92	65-125		
Ethylbenzene	43.1	5.00	ug/kg wet	50.000		86	70-125		
Methylene Chloride	44.4	6.00	ug/kg wet	50.000		89	45-140		
Styrene	44.4	5.00	ug/kg wet	50.000		89	70-125		
Tetrachloroethene	47.1	5.00	ug/kg wet	50.000		94	60-130		
trans-1,2-Dichloroethene	48.2	5.00	ug/kg wet	50.000		96	65-130		
Toluene	41.6	5.00	ug/kg wet	50.000		83	70-125		
trans-1,3-Dichloropropene	46.4	5.00	ug/kg wet	50.000		93	65-125		
Trichloroethene	48.6	5.00	ug/kg wet	50.000		97	70-130		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/26/2012 15:43

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204225 - SW 5035A									
LCS (L204225-BS1)			Prepared & Analyzed: 04/19/2012						
Vinyl chloride	45.8	10.0	ug/kg wet	50.000		92	50-150		
Xylenes, total	134	5.00	ug/kg wet	150.00		89	70-125		
Surrogate: 1,2-Dichloroethane-d4	*57.4*		*ug/kg wet*	*50.000*		*115*	*60-130*		
Surrogate: Toluene-d8	*44.5*		*ug/kg wet*	*50.000*		*89*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*48.5*		*ug/kg wet*	*50.000*		*97*	*72-144*		
Matrix Spike (L204225-MS1)		**Source: 1204070-01**	Prepared & Analyzed: 04/19/2012						
1,1,1-Trichloroethane	71.5	5.78	ug/kg dry	57.761	5.52 U	124	65-130		
1,1,2,2-Tetrachloroethane	43.9	5.78	ug/kg dry	57.761	5.52 U	76	50-130		
1,1,2-Trichloroethane	51.3	5.78	ug/kg dry	57.761	5.52 U	89	60-125		
1,1-Dichloroethane	56.4	5.78	ug/kg dry	57.761	5.52 U	98	70-130		
1,1-Dichloroethene	50.0	5.78	ug/kg dry	57.761	5.52 U	87	60-130		
1,2-Dichloroethane	73.8	6.93	ug/kg dry	57.761	6.62 U	128	60-130		
1,2-Dichloroethene (total)	101	5.78	ug/kg dry	115.52	5.52 U	87	75-125		
1,2-Dichloropropane	58.7	5.78	ug/kg dry	57.761	5.52 U	102	70-130		
2-Butanone	47.8	13.9	ug/kg dry	57.761	13.2 U	83	20-200		
2-Hexanone	46.3	13.9	ug/kg dry	57.761	13.2 U	80	20-200		
4-Methyl-2-pentanone	49.2	13.9	ug/kg dry	57.761	13.2 U	85	40-150		
Acetone	48.5	13.9	ug/kg dry	57.761	13.2 U	84	15-240		
Benzene	51.5	5.78	ug/kg dry	57.761	5.52 U	89	75-125		
Bromodichloromethane	69.2	6.93	ug/kg dry	57.761	6.62 U	120	65-135		
Bromoform	59.7	5.78	ug/kg dry	57.761	5.52 U	103	60-130		
Bromomethane	51.7	11.6	ug/kg dry	57.761	11.0 U	89	40-150		
Carbon Disulfide	48.9	5.78	ug/kg dry	57.761	5.52 U	85	55-140		
Carbon Tetrachloride	73.9	5.78	ug/kg dry	57.761	5.52 U	128	60-135		
Chlorobenzene	52.4	5.78	ug/kg dry	57.761	5.52 U	91	70-125		
Chloroethane	49.8	11.6	ug/kg dry	57.761	11.0 U	86	50-150		
Chloroform	65.6	5.78	ug/kg dry	57.761	5.52 U	114	70-130		
Chloromethane	48.8	11.6	ug/kg dry	57.761	11.0 U	84	40-130		
cis-1,2-Dichloroethene	50.0	5.78	ug/kg dry	57.761	5.52 U	87	70-125		
cis-1,3-Dichloropropene	53.0	5.78	ug/kg dry	57.761	5.52 U	92	70-125		
Dibromochloromethane	60.1	5.78	ug/kg dry	57.761	5.52 U	104	65-125		
Ethylbenzene	52.3	5.78	ug/kg dry	57.761	5.52 U	91	70-125		
Methylene Chloride	45.0	6.93	ug/kg dry	57.761	6.62 U	78	45-140		
Styrene	54.0	5.78	ug/kg dry	57.761	5.52 U	93	70-125		
Tetrachloroethene	56.4	5.78	ug/kg dry	57.761	5.52 U	98	60-130		
trans-1,2-Dichloroethene	50.6	5.78	ug/kg dry	57.761	5.52 U	88	65-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 15:43

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204225 - SW 5035A									
Matrix Spike (L204225-MS1)	**Source: 1204070-01**		Prepared & Analyzed: 04/19/2012						
Toluene	48.9	5.78	ug/kg dry	57.761	5.52 U	85	70-125		
trans-1,3-Dichloropropene	58.9	5.78	ug/kg dry	57.761	5.52 U	102	65-125		
Trichloroethene	62.6	5.78	ug/kg dry	57.761	5.52 U	108	70-130		
Vinyl chloride	45.8	11.6	ug/kg dry	57.761	11.0 U	79	50-150		
Xylenes, total	159	5.78	ug/kg dry	173.28	5.52 U	92	70-125		
Surrogate: 1,2-Dichloroethane-d4	*74.8*		*ug/kg dry*	*57.761*		*130*	*60-130*		
Surrogate: Toluene-d8	*51.5*		*ug/kg dry*	*57.761*		*89*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*59.7*		*ug/kg dry*	*57.761*		*103*	*72-144*		
Matrix Spike Dup (L204225-MSD1)	**Source: 1204070-01**		Prepared & Analyzed: 04/19/2012						
1,1,1-Trichloroethane	67.3	5.50	ug/kg dry	54.976	5.52 U	122	65-130	1	20
1,1,2,2-Tetrachloroethane	39.2	5.50	ug/kg dry	54.976	5.52 U	71	50-130	6	20
1,1,2-Trichloroethane	46.6	5.50	ug/kg dry	54.976	5.52 U	85	60-125	5	20
1,1-Dichloroethane	52.0	5.50	ug/kg dry	54.976	5.52 U	95	70-130	3	20
1,1-Dichloroethene	49.4	5.50	ug/kg dry	54.976	5.52 U	90	60-130	4	20
1,2-Dichloroethane	70.0	6.60	ug/kg dry	54.976	6.62 U	127	60-130	0.4	20
1,2-Dichloroethene (total)	94.1	5.50	ug/kg dry	109.95	5.52 U	86	75-125	2	20
1,2-Dichloropropane	51.7	5.50	ug/kg dry	54.976	5.52 U	94	70-130	8	20
2-Butanone	40.6	13.2	ug/kg dry	54.976	13.2 U	74	20-200	11	20
2-Hexanone	45.2	13.2	ug/kg dry	54.976	13.2 U	82	20-200	3	20
4-Methyl-2-pentanone	46.0	13.2	ug/kg dry	54.976	13.2 U	84	40-150	2	20
Acetone	40.7	13.2	ug/kg dry	54.976	13.2 U	74	15-240	12	20
Benzene	48.6	5.50	ug/kg dry	54.976	5.52 U	88	75-125	0.8	20
Bromodichloromethane	64.1	6.60	ug/kg dry	54.976	6.62 U	117	65-135	3	20
Bromoform	54.9	5.50	ug/kg dry	54.976	5.52 U	100	60-130	3	20
Bromomethane	53.7	11.0	ug/kg dry	54.976	11.0 U	98	40-150	9	20
Carbon Disulfide	47.6	5.50	ug/kg dry	54.976	5.52 U	86	55-140	2	20
Carbon Tetrachloride	69.7	5.50	ug/kg dry	54.976	5.52 U	127	60-135	0.8	20
Chlorobenzene	48.5	5.50	ug/kg dry	54.976	5.52 U	88	70-125	3	20
Chloroethane	49.3	11.0	ug/kg dry	54.976	11.0 U	90	50-150	4	20
Chloroform	60.5	5.50	ug/kg dry	54.976	5.52 U	110	70-130	3	20
Chloromethane	45.7	11.0	ug/kg dry	54.976	11.0 U	83	40-130	2	20
cis-1,2-Dichloroethene	46.9	5.50	ug/kg dry	54.976	5.52 U	85	70-125	2	20
cis-1,3-Dichloropropene	48.7	5.50	ug/kg dry	54.976	5.52 U	88	70-125	4	20
Dibromochloromethane	54.9	5.50	ug/kg dry	54.976	5.52 U	100	65-125	4	20
Ethylbenzene	46.8	5.50	ug/kg dry	54.976	5.52 U	85	70-125	6	20
Methylene Chloride	43.2	6.60	ug/kg dry	54.976	6.62 U	78	45-140	0.7	20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/26/2012 15:43

Volatile Organic Compounds by SW846 8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204225 - SW 5035A									
Matrix Spike Dup (L204225-MSD1)	**Source: 1204070-01**		Prepared & Analyzed: 04/19/2012						
Styrene	49.4	5.50	ug/kg dry	54.976	5.52 U	90	70-125	4	20
Tetrachloroethene	52.4	5.50	ug/kg dry	54.976	5.52 U	95	60-130	3	20
trans-1,2-Dichloroethene	47.2	5.50	ug/kg dry	54.976	5.52 U	86	65-130	2	20
Toluene	45.1	5.50	ug/kg dry	54.976	5.52 U	82	70-125	3	20
trans-1,3-Dichloropropene	55.1	5.50	ug/kg dry	54.976	5.52 U	100	65-125	2	20
Trichloroethene	60.5	5.50	ug/kg dry	54.976	5.52 U	110	70-130	2	20
Vinyl chloride	45.4	11.0	ug/kg dry	54.976	11.0 U	83	50-150	4	20
Xylenes, total	147	5.50	ug/kg dry	164.93	5.52 U	89	70-125	3	20
Surrogate: 1,2-Dichloroethane-d4	*70.6*		*ug/kg dry*	*54.976*		*129*	*60-130*		
Surrogate: Toluene-d8	*47.5*		*ug/kg dry*	*54.976*		*86*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*54.6*		*ug/kg dry*	*54.976*		*99*	*72-144*		

PREPARATION BENCH SHEET

L204225

Lionville Laboratory

Printed: 4/20/2012 10:03:55AM

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Matrix: Solid **Prepared using: VOAGCMS - SW 5035A** **Surrogate used: 0902344**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204070-01	8260B TCL VOC	04/19/2012 14:55	4.75	5				5	WC-Hanford, Inc.	
L204225-BLK1	QC	04/19/2012 14:21	5	5				5		
L204225-BS1	QC	04/19/2012 13:10	5	5	1200518		5	5		
L204225-MS1	QC	04/19/2012 15:30	4.54	5	1200518	1204070-01	5	5		
L204225-MSD1	QC	04/19/2012 16:04	4.77	5	1200518	1204070-01	5	5		

R 4/24/12

Extracts Relinquished By Date

MAPRW 4/20/12

Extracts Received By Date

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/07/2012 15:23

Analytical Report for TCLP Volatiles by SW846 1311/8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Date Received: 04-19-2012

GC/MS VOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 04-17-2012.

The sample and associated QC samples were leached 04-25-2012 and analyzed 04-26-2012 according to criteria set forth in Lionville Laboratory SOPs. The leaching procedure was based on SW846 Method 1311 and the analysis procedure was based on SW846 Method 8260B.

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

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

2. The samples were analyzed within recommended holding time.

3. All samples were analyzed with a 5-fold instrument dilution due to the leachate matrix; however, all TCLP regulatory limits were achieved. Reporting limits have been adjusted to reflect the necessary dilutions.

4. All obtainable surrogate recoveries were within acceptance criteria.

5. All matrix spike recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. The method blanks were below the reporting limit for all target compounds.

8. All internal standard area and retention time criteria were met.

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. Manual integrations are performed according to SOP QA-125 to produce quality data with 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").

12. "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

5/8/12
Date

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 concetration 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 quan 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 quan modifications:

MP	-	Missed Peak: Manually added peak not found by automatic quan program.
PA	-	Peak Assignment: quan 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 signal., or other interference.
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 15:23

J1P0W3
1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Volatiles by SW846 1311/8260B									
Vinyl chloride	0.05	U	0.05	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
1,1-Dichloroethene	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
2-Butanone	0.05	U	0.05	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Chloroform	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Carbon Tetrachloride	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Benzene	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
1,2-Dichloroethane	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Trichloroethene	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Tetrachloroethene	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Chlorobenzene	0.02	U	0.02	mg/L	5	L204310	04/26/2012	04/26/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*95 %*		*60-140*			*L204310*	*04/26/2012*	*04/26/2012*	*8260B*
Surrogate: Toluene-d8	*78 %*		*65-120*			*L204310*	*04/26/2012*	*04/26/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*94 %*		*75-130*			*L204310*	*04/26/2012*	*04/26/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 15:23

TCLP Volatiles by SW846 1311/8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204310 - SW 5030B										
Blank (L204310-BLK1)				Prepared & Analyzed: 04/26/2012						
Vinyl chloride	0.01	U	0.01	mg/L						
1,1-Dichloroethene	0.005	U	0.005	mg/L						
2-Butanone	0.01	U	0.01	mg/L						
Chloroform	0.005	U	0.005	mg/L						
Carbon Tetrachloride	0.005	U	0.005	mg/L						
Benzene	0.005	U	0.005	mg/L						
1,2-Dichloroethane	0.005	U	0.005	mg/L						
Trichloroethene	0.005	U	0.005	mg/L						
Tetrachloroethene	0.005	U	0.005	mg/L						
Chlorobenzene	0.005	U	0.005	mg/L						
Surrogate: 1,2-Dichloroethane-d4	*0.0484*			*mg/L*	*0.050000*		*97*	*60-140*		
Surrogate: Toluene-d8	*0.0397*			*mg/L*	*0.050000*		*79*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0503*			*mg/L*	*0.050000*		*101*	*75-130*		
Blank (L204310-BLK2)				Prepared & Analyzed: 04/26/2012						
Vinyl chloride	0.05	U	0.05	mg/L						
1,1-Dichloroethene	0.02	U	0.02	mg/L						
2-Butanone	0.05	U	0.05	mg/L						
Chloroform	0.02	U	0.02	mg/L						
Carbon Tetrachloride	0.02	U	0.02	mg/L						
Benzene	0.02	U	0.02	mg/L						
1,2-Dichloroethane	0.02	U	0.02	mg/L						
Trichloroethene	0.02	U	0.02	mg/L						
Tetrachloroethene	0.02	U	0.02	mg/L						
Chlorobenzene	0.02	U	0.02	mg/L						
Surrogate: 1,2-Dichloroethane-d4	*0.239*			*mg/L*	*0.25000*		*96*	*60-140*		
Surrogate: Toluene-d8	*0.196*			*mg/L*	*0.25000*		*78*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.242*			*mg/L*	*0.25000*		*97*	*75-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 15:23

TCLP Volatiles by SW846 1311/8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204310 - SW 5030B										
LCS (L204310-BS1)				Prepared & Analyzed: 04/26/2012						
Vinyl chloride	0.04		0.01	mg/L	0.050000		78	55-135		20
1,1-Dichloroethene	0.05		0.005	mg/L	0.050000		101	65-140		20
2-Butanone	0.05		0.01	mg/L	0.050000		98	20-200		20
Chloroform	0.05		0.005	mg/L	0.050000		102	75-125		20
Carbon Tetrachloride	0.05		0.005	mg/L	0.050000		94	65-130		20
Benzene	0.05		0.005	mg/L	0.050000		95	75-125		20
1,2-Dichloroethane	0.05		0.005	mg/L	0.050000		100	60-140		20
Trichloroethene	0.05		0.005	mg/L	0.050000		96	75-125		20
Tetrachloroethene	0.04		0.005	mg/L	0.050000		85	70-130		20
Chlorobenzene	0.05		0.005	mg/L	0.050000		93	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.0471*			*mg/L*	*0.050000*		*94*	*60-140*		
Surrogate: Toluene-d8	*0.0391*			*mg/L*	*0.050000*		*78*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0487*			*mg/L*	*0.050000*		*97*	*75-130*		
Matrix Spike (L204310-MS1)		**Source: 1204070-01**		Prepared & Analyzed: 04/26/2012						
Vinyl chloride	0.18	D	0.05	mg/L	0.25000	0.05 U	70	55-135		20
1,1-Dichloroethene	0.25	D	0.02	mg/L	0.25000	0.02 U	101	65-140		20
2-Butanone	0.23	D	0.05	mg/L	0.25000	0.05 U	93	20-200		20
Chloroform	0.26	D	0.02	mg/L	0.25000	0.02 U	102	75-125		20
Carbon Tetrachloride	0.25	D	0.02	mg/L	0.25000	0.02 U	98	65-130		20
Benzene	0.24	D	0.02	mg/L	0.25000	0.02 U	96	75-125		20
1,2-Dichloroethane	0.25	D	0.02	mg/L	0.25000	0.02 U	99	60-140		20
Trichloroethene	0.24	D	0.02	mg/L	0.25000	0.02 U	96	75-125		20
Tetrachloroethene	0.21	D	0.02	mg/L	0.25000	0.02 U	86	70-130		20
Chlorobenzene	0.24	D	0.02	mg/L	0.25000	0.02 U	96	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.233*			*mg/L*	*0.25000*		*93*	*60-140*		
Surrogate: Toluene-d8	*0.197*			*mg/L*	*0.25000*		*79*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.244*			*mg/L*	*0.25000*		*97*	*75-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 15:23

TCLP Volatiles by SW846 1311/8260B - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204310 - SW 5030B										
Matrix Spike Dup (L204310-MSD1)		**Source: 1204070-01**		Prepared & Analyzed: 04/26/2012						
Vinyl chloride	0.19	D	0.05	mg/L	0.25000	0.05 U	76	55-135	8	20
1,1-Dichloroethene	0.26	D	0.02	mg/L	0.25000	0.02 U	102	65-140	1	20
2-Butanone	0.25	D	0.05	mg/L	0.25000	0.05 U	98	20-200	6	20
Chloroform	0.25	D	0.02	mg/L	0.25000	0.02 U	101	75-125	0.6	20
Carbon Tetrachloride	0.25	D	0.02	mg/L	0.25000	0.02 U	100	65-130	2	20
Benzene	0.24	D	0.02	mg/L	0.25000	0.02 U	97	75-125	0.4	20
1,2-Dichloroethane	0.25	D	0.02	mg/L	0.25000	0.02 U	100	60-140	0.6	20
Trichloroethene	0.25	D	0.02	mg/L	0.25000	0.02 U	99	75-125	3	20
Tetrachloroethene	0.22	D	0.02	mg/L	0.25000	0.02 U	87	70-130	2	20
Chlorobenzene	0.24	D	0.02	mg/L	0.25000	0.02 U	95	75-125	1	20
Surrogate: 1,2-Dichloroethane-d4	*0.238*			*mg/L*	*0.25000*		*95*	*60-140*		
Surrogate: Toluene-d8	*0.201*			*mg/L*	*0.25000*		*80*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.246*			*mg/L*	*0.25000*		*99*	*75-130*		

Lionville Laboratory Incorporated

TCLP EXTRACTION RECORD (VOLATILES)

Logbook # 779

Start Date: 4-25-12 Start Time: 10:30 Analyst: RH SOP: SPI-1311.2 Rev. 01C pH of Extraction Fluid:	End Date: 4-26-12 End Time: 04:30 Analyst: RH	Tumbler Speed: 30 RPM Leachate Batch #: L204279 Leachate Page: 1 of 1 Room Temp.(°C) 21 / 21 (start/finish)

COC # 1204070-01 Client ID# JIPOW3 ZHE #: 22 Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: * RAD I Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # L204279/1200533 Client ID# N/A ZHE #: 16 Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: BLANK ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID# ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID# ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID#: ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA 4-26-12 Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID#: ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: RH Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N

Comments:

Reviewed By/Date: RGS 5/7/12

PREPARATION BENCH SHEET

L204310

Lionville Laboratory

Printed: 5/1/2012 11:31:48AM

Matrix: Water **Prepared using: VOAGCMS - SW 5030B** **Surrogate used: 0900049**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204070-01	1311/8260B TCLV ZHE VOA	04/26/2012 12:47	5	5				25	WC-Hanford, Inc.	
L204310-BLK1	QC	04/26/2012 11:29	5	5				5		
L204310-BLK2	QC	04/26/2012 12:12	5	5				25		
L204310-BS1	QC	04/26/2012 10:53	5	5	1200518		5	5		
L204310-MS1	QC	04/26/2012 13:20	5	5	1200518	1204070-01	25	25		
L204310-MSD1	QC	04/26/2012 13:54	5	5	1200518	1204070-01	25	25		

B 5/1/12

Extracts Relinquished By Date

MA 5/7/12

Extracts Received By Date

SEMIVOLATILES

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 10:12

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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Exton, Pennsylvania 19341
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Case Narrative

Client: WC-HANFORD RC-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Date Received: 04-19-2012

SEMIVOLATILE

One (1) soil sample was collected on 04-17-2012.

The sample and associated QC samples were extracted 04-23-2012 analyzed 05-01-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for TCL Semivolatile target compounds.

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

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

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

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

4. Three (3) samples required dilution due to the matrix. The samples J1P0W3, L204251-MS1 and L204251-MSD1 required a 2-fold dilution. Reporting limits have been adjusted to reflect the necessary dilutions.

5. One (1) of thirty (30) surrogate recoveries were outside acceptance criteria. The loss of the surrogate 2,4,6-Tribromophenol in the sample J1P0W3 appears to be due to a chemical reaction rather than to a problem with the extraction process. Peaks on the chromatogram indicate this reaction. The conversion compound has been reported as a non-target compound in the sample at a retention time of 20.741 minutes. The loss of this surrogate has been associated with the use of soxhlet extractions.

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

7. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS095) has been enclosed.

8. All matrix spike recoveries 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.

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

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

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

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

13. 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").

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

Iain Daniels
LvL Laboratory Manager

5/8/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS095

Initiator: Sharon Saylor
Date: 5-8-12
Client: WCHanford RC-228K3873

Batch: 1204070
Samples: L204251-851
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: SOIL
Prep Batch: L204251

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)

low recovery of 2,4-dinitrophenol in L204251-851 but L204251-ms1 and L204251-msd1 are OK

2. Known or Probable Causes(s) Acidic phenols subject to erratic chromatographic behavior.

RGC 5/8/12

3. Discussion and Proposed Action Other Description:

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

narrate Sample ND, ms/msd within criteria
minimal impact to the data

RGC 5/8/12

4. Project Manager Instructions...signature/date: 5/8/12

__ 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: 5/8/12 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

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.

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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.

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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 quan 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 quan modifications:

MP	-	Missed Peak: Manually added peak not found by automatic quan program.
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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 signal., or other interference.
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

J1P0W3
1204070-01 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,2,4-Trichlorobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
1,2-Dichlorobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
1,3-Dichlorobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
1,4-Dichlorobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4,5-Trichlorophenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4,6-Trichlorophenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4-Dichlorophenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4-Dimethylphenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4-Dinitrophenol	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,4-Dinitrotoluene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2,6-Dinitrotoluene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Chloronaphthalene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Chlorophenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Methylnaphthalene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Methylphenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Nitroaniline	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
2-Nitrophenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
3,3'-Dichlorobenzidine	1360	U	1360	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
3-Nitroaniline	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4,6-Dinitro-2-methylphenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Bromophenyl Phenyl Ether	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Chloro-3-methylphenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Chloroaniline	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Chlorophenyl Phenyl Ether	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
3- and/or 4-Methylphenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Nitroaniline	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
4-Nitrophenol	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Acenaphthene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Acenaphthylene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Anthracene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Benz[a]anthracene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Benzo[a] pyrene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Benzo[b] fluoranthene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Benzo[g,h,i] perylene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Benzo[k] fluoranthene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Bis(2-chloroethoxy) methane	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

J1P0W3
1204070-01 (Soil)

Lionville Laboratory

Semivolatile Organic Compounds by SW846 8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Bis(2-chloroethyl) ether	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Bis(2-chloroisopropyl) ether	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Bis(2-ethylhexyl) phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Butyl Benzyl Phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Carbazole	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Chrysene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Dibenz[a,h]anthracene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Dibenzofuran	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Diethyl Phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Dimethyl Phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Di-n-butyl Phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Di-n-octyl Phthalate	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Fluoranthene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Fluorene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Hexachlorobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Hexachlorobutadiene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Hexachlorocyclopentadiene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Hexachloroethane	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Indeno[1,2,3-cd]pyrene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Isophorone	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Naphthalene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Nitrobenzene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
N-Nitrosodi-n-propylamine	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
N-Nitrosodiphenylamine	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Pentachlorophenol	3390	U	3390	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Phenanthrene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Phenol	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Pyrene	678	U	678	ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
TIC:Aldol Condensate 1	**179**	A, D, J		ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
TIC:Aldol Condensate 2	**595**	A, B, D, J		ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
TIC:Aldol Condensate 3	**84400**	A, B, D, J		ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
TIC:Unknown 1	**7930**	D, J		ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
TIC:Unknown 2	**437**	J, D		ug/kg dry	2	L204251	04/23/2012	05/01/2012	8270C
Surrogate: 2-Fluorophenol	*59 %*		*25-121*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*
Surrogate: Phenol-d5	*63 %*		*24-113*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*57 %*		*23-120*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

J1P0W3

1204070-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*60 %*	*30-115*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*13 % **	*19-122*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*70 %*	*18-137*			*L204251*	*04/23/2012*	*05/01/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

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 L204251 - SW 3540C										
Blank (L204251-BLK1)				Prepared: 04/23/2012 Analyzed: 05/01/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg wet						
1,2-Dichlorobenzene	330	U	330	ug/kg wet						
1,3-Dichlorobenzene	330	U	330	ug/kg wet						
1,4-Dichlorobenzene	330	U	330	ug/kg wet						
2,4,5-Trichlorophenol	330	U	330	ug/kg wet						
2,4,6-Trichlorophenol	330	U	330	ug/kg wet						
2,4-Dichlorophenol	330	U	330	ug/kg wet						
2,4-Dimethylphenol	330	U	330	ug/kg wet						
2,4-Dinitrophenol	1650	U	1650	ug/kg wet						
2,4-Dinitrotoluene	330	U	330	ug/kg wet						
2,6-Dinitrotoluene	330	U	330	ug/kg wet						
2-Chloronaphthalene	330	U	330	ug/kg wet						
2-Chlorophenol	330	U	330	ug/kg wet						
2-Methylnaphthalene	330	U	330	ug/kg wet						
2-Methylphenol	330	U	330	ug/kg wet						
2-Nitroaniline	1650	U	1650	ug/kg wet						
2-Nitrophenol	330	U	330	ug/kg wet						
3,3'-Dichlorobenzidine	660	U	660	ug/kg wet						
3-Nitroaniline	1650	U	1650	ug/kg wet						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg wet						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg wet						
4-Chloro-3-methylphenol	330	U	330	ug/kg wet						
4-Chloroaniline	330	U	330	ug/kg wet						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg wet						
3- and/or 4-Methylphenol	330	U	330	ug/kg wet						
4-Nitroaniline	1650	U	1650	ug/kg wet						
4-Nitrophenol	1650	U	1650	ug/kg wet						
Acenaphthene	330	U	330	ug/kg wet						
Acenaphthylene	330	U	330	ug/kg wet						
Anthracene	330	U	330	ug/kg wet						
Benz[a]anthracene	330	U	330	ug/kg wet						
Benzo[a] pyrene	330	U	330	ug/kg wet						
Benzo[b] fluoranthene	330	U	330	ug/kg wet						
Benzo[g,h,i] perylene	330	U	330	ug/kg wet						
Benzo[k] fluoranthene	330	U	330	ug/kg wet						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg wet						

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 10:12

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 L204251 - SW 3540C										
Blank (L204251-BLK1)				Prepared: 04/23/2012 Analyzed: 05/01/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg wet						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg wet						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg wet						
Butyl Benzyl Phthalate	330	U	330	ug/kg wet						
Carbazole	330	U	330	ug/kg wet						
Chrysene	330	U	330	ug/kg wet						
Dibenz[a,h]anthracene	330	U	330	ug/kg wet						
Dibenzofuran	330	U	330	ug/kg wet						
Diethyl Phthalate	330	U	330	ug/kg wet						
Dimethyl Phthalate	330	U	330	ug/kg wet						
Di-n-butyl Phthalate	330	U	330	ug/kg wet						
Di-n-octyl Phthalate	330	U	330	ug/kg wet						
Fluoranthene	330	U	330	ug/kg wet						
Fluorene	330	U	330	ug/kg wet						
Hexachlorobenzene	330	U	330	ug/kg wet						
Hexachlorobutadiene	330	U	330	ug/kg wet						
Hexachlorocyclopentadiene	330	U	330	ug/kg wet						
Hexachloroethane	330	U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg wet						
Isophorone	330	U	330	ug/kg wet						
Naphthalene	330	U	330	ug/kg wet						
Nitrobenzene	330	U	330	ug/kg wet						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg wet						
N-Nitrosodiphenylamine	330	U	330	ug/kg wet						
Pentachlorophenol	1650	U	1650	ug/kg wet						
Phenanthrene	330	U	330	ug/kg wet						
Phenol	330	U	330	ug/kg wet						
Pyrene	330	U	330	ug/kg wet						
Unknown 1	1220	J		ug/kg wet						
Aldol Condensate 2	33600	A, J		ug/kg wet						
Aldol Condensate 4	527	A, J		ug/kg wet						
Aldol Condensate 3	271	A, J		ug/kg wet						
Aldol Condensate 1	669	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1630*			*ug/kg wet*	*2500.0*		*65*	*25-121*		
Surrogate: Phenol-d5	*1740*			*ug/kg wet*	*2500.0*		*69*	*24-113*		
Surrogate: Nitrobenzene-d5	*1120*			*ug/kg wet*	*1666.7*		*67*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

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 L204251 - SW 3540C									
Blank (L204251-BLK1)			Prepared: 04/23/2012 Analyzed: 05/01/2012						
Surrogate: 2-Fluorobiphenyl	*1060*		*ug/kg wet*	*1666.7*		*64*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1130*		*ug/kg wet*	*2500.0*		*45*	*19-122*		
Surrogate: p-Terphenyl-d14	*1290*		*ug/kg wet*	*1666.7*		*78*	*18-137*		
LCS (L204251-BS1)			Prepared: 04/23/2012 Analyzed: 05/01/2012						
1,2,4-Trichlorobenzene	1200		ug/kg wet	2000.0		60	45-110		
1,2-Dichlorobenzene	1290		ug/kg wet	2000.0		64	45-105		
1,3-Dichlorobenzene	1240		ug/kg wet	2000.0		62	40-100		
1,4-Dichlorobenzene	1260		ug/kg wet	2000.0		63	35-105		
2,4,5-Trichlorophenol	1380		ug/kg wet	2000.0		69	30-140		
2,4,6-Trichlorophenol	907		ug/kg wet	2000.0		45	20-110		
2,4-Dichlorophenol	1380		ug/kg wet	2000.0		69	40-110		
2,4-Dimethylphenol	1260		ug/kg wet	2000.0		63	30-105		
2,4-Dinitrophenol	273		ug/kg wet	2000.0		14*	25-130		
2,4-Dinitrotoluene	1470		ug/kg wet	2000.0		73	50-115		
2,6-Dinitrotoluene	1430		ug/kg wet	2000.0		71	40-120		
2-Chloronaphthalene	1280		ug/kg wet	2000.0		64	45-115		
2-Chlorophenol	1340		ug/kg wet	2000.0		67	45-105		
2-Methylnaphthalene	1320		ug/kg wet	2000.0		66	45-110		
2-Methylphenol	1510		ug/kg wet	2000.0		75	40-120		
2-Nitroaniline	1570		ug/kg wet	2000.0		78	45-120		
2-Nitrophenol	1270		ug/kg wet	2000.0		63	40-110		
3,3'-Dichlorobenzidine	1020		ug/kg wet	2000.0		51	15-130		
3-Nitroaniline	1440		ug/kg wet	2000.0		72	40-130		
4,6-Dinitro-2-methylphenol	524		ug/kg wet	2000.0		26	20-140		
4-Bromophenyl Phenyl Ether	1260		ug/kg wet	2000.0		63	45-115		
4-Chloro-3-methylphenol	1570		ug/kg wet	2000.0		79	35-115		
4-Chloroaniline	862		ug/kg wet	2000.0		43	10-100		
4-Chlorophenyl Phenyl Ether	1340		ug/kg wet	2000.0		67	45-110		
3- and/or 4-Methylphenol	1470		ug/kg wet	2000.0		73	40-120		
4-Nitroaniline	1440		ug/kg wet	2000.0		72	40-130		
4-Nitrophenol	1420		ug/kg wet	2000.0		71	15-140		
Acenaphthene	1280		ug/kg wet	2000.0		64	45-110		
Acenaphthylene	1130		ug/kg wet	2000.0		57	45-115		
Anthracene	1350		ug/kg wet	2000.0		67	45-130		
Benz[a]anthracene	1420		ug/kg wet	2000.0		71	45-130		
Benzo[a] pyrene	1300		ug/kg wet	2000.0		65	45-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

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 L204251 - SW 3540C									
LCS (L204251-BS1)			Prepared: 04/23/2012 Analyzed: 05/01/2012						
Benzo[b] fluoranthene	1280		ug/kg wet	2000.0		64	40-130		
Benzo[g,h,i] perylene	1350		ug/kg wet	2000.0		68	45-125		
Benzo[k] fluoranthene	1330		ug/kg wet	2000.0		67	45-125		
Bis(2-chloroethoxy) methane	1430		ug/kg wet	2000.0		71	45-110		
Bis(2-chloroethyl) ether	1350		ug/kg wet	2000.0		68	40-110		
Bis(2-chloroisopropyl) ether	1510		ug/kg wet	2000.0		75	30-115		
Bis(2-ethylhexyl) phthalate	1580		ug/kg wet	2000.0		79	40-145		
Butyl Benzyl Phthalate	1440		ug/kg wet	2000.0		72	50-125		
Carbazole	1580		ug/kg wet	2000.0		79	40-140		
Chrysene	1460		ug/kg wet	2000.0		73	45-130		
Dibenz[a,h]anthracene	1380		ug/kg wet	2000.0		69	45-125		
Dibenzofuran	1360		ug/kg wet	2000.0		68	45-120		
Diethyl Phthalate	1410		ug/kg wet	2000.0		70	50-125		
Dimethyl Phthalate	1310		ug/kg wet	2000.0		66	45-130		
Di-n-butyl Phthalate	1320		ug/kg wet	2000.0		66	50-130		
Di-n-octyl Phthalate	1520		ug/kg wet	2000.0		76	40-150		
Fluoranthene	1330		ug/kg wet	2000.0		66	45-130		
Fluorene	1370		ug/kg wet	2000.0		68	45-120		
Hexachlorobenzene	1300		ug/kg wet	2000.0		65	45-130		
Hexachlorobutadiene	1290		ug/kg wet	2000.0		65	45-105		
Hexachlorocyclopentadiene	740		ug/kg wet	2000.0		37	10-100		
Hexachloroethane	1250		ug/kg wet	2000.0		62	35-110		
Indeno[1,2,3-cd]pyrene	1370		ug/kg wet	2000.0		68	45-130		
Isophorone	1330		ug/kg wet	2000.0		66	40-110		
Naphthalene	1420		ug/kg wet	2000.0		71	40-110		
Nitrobenzene	1330		ug/kg wet	2000.0		66	40-105		
N-Nitrosodi-n-propylamine	1550		ug/kg wet	2000.0		77	30-130		
N-Nitrosodiphenylamine	1330		ug/kg wet	2000.0		66	50-120		
Pentachlorophenol	543		ug/kg wet	2000.0		27	25-120		
Phenanthrene	1360		ug/kg wet	2000.0		68	50-120		
Phenol	1480		ug/kg wet	2000.0		74	40-115		
Pyrene	1310		ug/kg wet	2000.0		65	45-125		
Surrogate: 2-Fluorophenol	*1760*		*ug/kg wet*	*2500.0*		*71*	*25-121*		
Surrogate: Phenol-d5	*1900*		*ug/kg wet*	*2500.0*		*76*	*24-113*		
Surrogate: Nitrobenzene-d5	*1210*		*ug/kg wet*	*1666.7*		*73*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1120*		*ug/kg wet*	*1666.7*		*67*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*891*		*ug/kg wet*	*2500.0*		*36*	*19-122*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	Reported: 05/08/2012 10:12

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 L204251 - SW 3540C										
LCS (L204251-BS1)				Prepared: 04/23/2012 Analyzed: 05/01/2012						
Surrogate: p-Terphenyl-d14	*1180*			*ug/kg wet*	*1666.7*		*71*	*18-137*		
Matrix Spike (L204251-MS1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 05/01/2012						
1,2,4-Trichlorobenzene	1370	D		ug/kg dry	2097.2	678 U	65	45-110		
1,2-Dichlorobenzene	1450	D		ug/kg dry	2097.2	678 U	69	45-105		
1,3-Dichlorobenzene	1340	D		ug/kg dry	2097.2	678 U	64	40-100		
1,4-Dichlorobenzene	1370	D		ug/kg dry	2097.2	678 U	65	35-105		
2,4,5-Trichlorophenol	1100	D		ug/kg dry	2097.2	678 U	53	30-140		
2,4,6-Trichlorophenol	640	D		ug/kg dry	2097.2	678 U	31	20-110		
2,4-Dichlorophenol	1590	D		ug/kg dry	2097.2	678 U	76	40-110		
2,4-Dimethylphenol	1720	D		ug/kg dry	2097.2	678 U	82	30-105		
2,4-Dinitrophenol	1160	D		ug/kg dry	2097.2	3390 U	55	25-130		
2,4-Dinitrotoluene	1800	D		ug/kg dry	2097.2	678 U	86	50-115		
2,6-Dinitrotoluene	1750	D		ug/kg dry	2097.2	678 U	84	40-120		
2-Chloronaphthalene	1600	D		ug/kg dry	2097.2	678 U	76	45-115		
2-Chlorophenol	1540	D		ug/kg dry	2097.2	678 U	73	45-105		
2-Methylnaphthalene	1570	D		ug/kg dry	2097.2	678 U	75	45-110		
2-Methylphenol	1800	D		ug/kg dry	2097.2	678 U	86	40-120		
2-Nitroaniline	1870	D		ug/kg dry	2097.2	3390 U	89	45-120		
2-Nitrophenol	1400	D		ug/kg dry	2097.2	678 U	67	40-110		
3,3'-Dichlorobenzidine	1200	D		ug/kg dry	2097.2	1360 U	57	15-130		
3-Nitroaniline	1650	D		ug/kg dry	2097.2	3390 U	79	40-130		
4,6-Dinitro-2-methylphenol	1470	D		ug/kg dry	2097.2	678 U	70	20-140		
4-Bromophenyl Phenyl Ether	1620	D		ug/kg dry	2097.2	678 U	77	45-115		
4-Chloro-3-methylphenol	1840	D		ug/kg dry	2097.2	678 U	88	35-115		
4-Chloroaniline	1050	D		ug/kg dry	2097.2	678 U	50	10-100		
4-Chlorophenyl Phenyl Ether	1670	D		ug/kg dry	2097.2	678 U	80	45-110		
3- and/or 4-Methylphenol	1750	D		ug/kg dry	2097.2	678 U	83	40-120		
4-Nitroaniline	1540	D		ug/kg dry	2097.2	3390 U	74	40-130		
4-Nitrophenol	1090	D		ug/kg dry	2097.2	3390 U	52	15-140		
Acenaphthene	1690	D		ug/kg dry	2097.2	678 U	80	45-110		
Acenaphthylene	1460	D		ug/kg dry	2097.2	678 U	70	45-115		
Anthracene	1760	D		ug/kg dry	2097.2	678 U	84	45-130		
Benz[a]anthracene	1790	D		ug/kg dry	2097.2	678 U	85	45-130		
Benzo[a] pyrene	1570	D		ug/kg dry	2097.2	678 U	75	45-130		
Benzo[b] fluoranthene	1540	D		ug/kg dry	2097.2	678 U	73	40-130		
Benzo[g,h,i] perylene	1570	D		ug/kg dry	2097.2	678 U	75	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	Reported: 05/08/2012 10:12

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 L204251 - SW 3540C										
Matrix Spike (L204251-MS1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 05/01/2012						
Benzo[k] fluoranthene	1640	D		ug/kg dry	2097.2	678 U	78	45-125		
Bis(2-chloroethoxy) methane	1640	D		ug/kg dry	2097.2	678 U	78	45-110		
Bis(2-chloroethyl) ether	1420	D		ug/kg dry	2097.2	678 U	68	40-110		
Bis(2-chloroisopropyl) ether	1640	D		ug/kg dry	2097.2	678 U	78	30-115		
Bis(2-ethylhexyl) phthalate	2080	D		ug/kg dry	2097.2	678 U	99	40-145		
Butyl Benzyl Phthalate	1950	D		ug/kg dry	2097.2	678 U	93	50-125		
Carbazole	1950	D		ug/kg dry	2097.2	678 U	93	40-140		
Chrysene	1890	D		ug/kg dry	2097.2	678 U	90	45-130		
Dibenz[a,h]anthracene	2010	D		ug/kg dry	2097.2	678 U	96	45-125		
Dibenzofuran	1770	D		ug/kg dry	2097.2	678 U	84	45-120		
Diethyl Phthalate	1800	D		ug/kg dry	2097.2	678 U	86	50-125		
Dimethyl Phthalate	1690	D		ug/kg dry	2097.2	678 U	81	45-130		
Di-n-butyl Phthalate	1750	D		ug/kg dry	2097.2	678 U	84	50-130		
Di-n-octyl Phthalate	1910	D		ug/kg dry	2097.2	678 U	91	40-150		
Fluoranthene	1690	D		ug/kg dry	2097.2	678 U	81	45-130		
Fluorene	1760	D		ug/kg dry	2097.2	678 U	84	45-120		
Hexachlorobenzene	1680	D		ug/kg dry	2097.2	678 U	80	45-130		
Hexachlorobutadiene	1410	D		ug/kg dry	2097.2	678 U	67	45-105		
Hexachlorocyclopentadiene	484	D		ug/kg dry	2097.2	678 U	23	10-100		
Hexachloroethane	1290	D		ug/kg dry	2097.2	678 U	62	35-110		
Indeno[1,2,3-cd]pyrene	1700	D		ug/kg dry	2097.2	678 U	81	45-130		
Isophorone	1560	D		ug/kg dry	2097.2	678 U	74	40-110		
Naphthalene	1670	D		ug/kg dry	2097.2	678 U	79	40-110		
Nitrobenzene	1510	D		ug/kg dry	2097.2	678 U	72	40-105		
N-Nitrosodi-n-propylamine	1710	D		ug/kg dry	2097.2	678 U	81	30-130		
N-Nitrosodiphenylamine	1830	D		ug/kg dry	2097.2	678 U	87	50-120		
Pentachlorophenol	1120	D		ug/kg dry	2097.2	3390 U	54	25-120		
Phenanthrene	1810	D		ug/kg dry	2097.2	678 U	86	50-120		
Phenol	1690	D		ug/kg dry	2097.2	678 U	80	40-115		
Pyrene	1770	D		ug/kg dry	2097.2	678 U	85	45-125		
Surrogate: 2-Fluorophenol	*1920*			*ug/kg dry*	*2621.5*		*73*	*25-121*		
Surrogate: Phenol-d5	*2140*			*ug/kg dry*	*2621.5*		*82*	*24-113*		
Surrogate: Nitrobenzene-d5	*1270*			*ug/kg dry*	*1747.6*		*73*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1380*			*ug/kg dry*	*1747.6*		*79*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*761*			*ug/kg dry*	*2621.5*		*29*	*19-122*		
Surrogate: p-Terphenyl-d14	*1530*			*ug/kg dry*	*1747.6*		*88*	*18-137*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

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 L204251 - SW 3540C										
Matrix Spike Dup (L204251-MSD1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 05/01/2012						
1,2,4-Trichlorobenzene	1340	D		ug/kg dry	2078.5	678 U	64	45-110	1	40
1,2-Dichlorobenzene	1430	D		ug/kg dry	2078.5	678 U	69	45-105	0.3	40
1,3-Dichlorobenzene	1320	D		ug/kg dry	2078.5	678 U	63	40-100	0.9	40
1,4-Dichlorobenzene	1360	D		ug/kg dry	2078.5	678 U	65	35-105	0.01	40
2,4,5-Trichlorophenol	1580	D		ug/kg dry	2078.5	678 U	76	30-140	36	40
2,4,6-Trichlorophenol	1070	D		ug/kg dry	2078.5	678 U	52	20-110	52*	40
2,4-Dichlorophenol	1650	D		ug/kg dry	2078.5	678 U	79	40-110	4	40
2,4-Dimethylphenol	1680	D		ug/kg dry	2078.5	678 U	81	30-105	1	40
2,4-Dinitrophenol	1090	D		ug/kg dry	2078.5	3390 U	53	25-130	5	40
2,4-Dinitrotoluene	1760	D		ug/kg dry	2078.5	678 U	85	50-115	2	40
2,6-Dinitrotoluene	1710	D		ug/kg dry	2078.5	678 U	82	40-120	2	40
2-Chloronaphthalene	1590	D		ug/kg dry	2078.5	678 U	76	45-115	0.4	40
2-Chlorophenol	1540	D		ug/kg dry	2078.5	678 U	74	45-105	0.7	40
2-Methylnaphthalene	1550	D		ug/kg dry	2078.5	678 U	74	45-110	0.6	40
2-Methylphenol	1790	D		ug/kg dry	2078.5	678 U	86	40-120	0.3	40
2-Nitroaniline	1850	D		ug/kg dry	2078.5	3390 U	89	45-120	0.4	40
2-Nitrophenol	1420	D		ug/kg dry	2078.5	678 U	68	40-110	2	40
3,3'-Dichlorobenzidine	1280	D		ug/kg dry	2078.5	1360 U	62	15-130	7	40
3-Nitroaniline	1670	D		ug/kg dry	2078.5	3390 U	80	40-130	2	40
4,6-Dinitro-2-methylphenol	1360	D		ug/kg dry	2078.5	678 U	65	20-140	7	40
4-Bromophenyl Phenyl Ether	1610	D		ug/kg dry	2078.5	678 U	77	45-115	0.2	40
4-Chloro-3-methylphenol	1830	D		ug/kg dry	2078.5	678 U	88	35-115	0.1	40
4-Chloroaniline	1090	D		ug/kg dry	2078.5	678 U	52	10-100	4	40
4-Chlorophenyl Phenyl Ether	1630	D		ug/kg dry	2078.5	678 U	78	45-110	1	40
3- and/or 4-Methylphenol	1730	D		ug/kg dry	2078.5	678 U	83	40-120	0.2	40
4-Nitroaniline	1590	D		ug/kg dry	2078.5	3390 U	77	40-130	4	40
4-Nitrophenol	1330	D		ug/kg dry	2078.5	3390 U	64	15-140	20	40
Acenaphthene	1640	D		ug/kg dry	2078.5	678 U	79	45-110	2	40
Acenaphthylene	1460	D		ug/kg dry	2078.5	678 U	70	45-115	1	40
Anthracene	1770	D		ug/kg dry	2078.5	678 U	85	45-130	1	40
Benz[a]anthracene	1750	D		ug/kg dry	2078.5	678 U	84	45-130	2	40
Benzo[a] pyrene	1540	D		ug/kg dry	2078.5	678 U	74	45-130	0.8	40
Benzo[b] fluoranthene	1530	D		ug/kg dry	2078.5	678 U	74	40-130	0.2	40
Benzo[g,h,i] perylene	1570	D		ug/kg dry	2078.5	678 U	75	45-125	0.4	40
Benzo[k] fluoranthene	1590	D		ug/kg dry	2078.5	678 U	77	45-125	2	40
Bis(2-chloroethoxy) methane	1630	D		ug/kg dry	2078.5	678 U	79	45-110	0.3	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/08/2012 10:12

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 L204251 - SW 3540C										
Matrix Spike Dup (L204251-MSD1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 05/01/2012						
Bis(2-chloroethyl) ether	1410	D		ug/kg dry	2078.5	678 U	68	40-110	0.4	40
Bis(2-chloroisopropyl) ether	1640	D		ug/kg dry	2078.5	678 U	79	30-115	1	40
Bis(2-ethylhexyl) phthalate	2000	D		ug/kg dry	2078.5	678 U	96	40-145	3	40
Butyl Benzyl Phthalate	1860	D		ug/kg dry	2078.5	678 U	89	50-125	4	40
Carbazole	1940	D		ug/kg dry	2078.5	678 U	94	40-140	0.5	40
Chrysene	1810	D		ug/kg dry	2078.5	678 U	87	45-130	3	40
Dibenz[a,h]anthracene	1610	D		ug/kg dry	2078.5	678 U	78	45-125	21	40
Dibenzofuran	1710	D		ug/kg dry	2078.5	678 U	82	45-120	2	40
Diethyl Phthalate	1720	D		ug/kg dry	2078.5	678 U	83	50-125	4	40
Dimethyl Phthalate	1650	D		ug/kg dry	2078.5	678 U	80	45-130	1	40
Di-n-butyl Phthalate	1750	D		ug/kg dry	2078.5	678 U	84	50-130	0.7	40
Di-n-octyl Phthalate	1850	D		ug/kg dry	2078.5	678 U	89	40-150	2	40
Fluoranthene	1690	D		ug/kg dry	2078.5	678 U	81	45-130	0.7	40
Fluorene	1700	D		ug/kg dry	2078.5	678 U	82	45-120	3	40
Hexachlorobenzene	1650	D		ug/kg dry	2078.5	678 U	79	45-130	0.8	40
Hexachlorobutadiene	1390	D		ug/kg dry	2078.5	678 U	67	45-105	0.6	40
Hexachlorocyclopentadiene	566	D		ug/kg dry	2078.5	678 U	27	10-100	17	40
Hexachloroethane	1300	D		ug/kg dry	2078.5	678 U	62	35-110	1	40
Indeno[1,2,3-cd]pyrene	1600	D		ug/kg dry	2078.5	678 U	77	45-130	5	40
Isophorone	1510	D		ug/kg dry	2078.5	678 U	73	40-110	2	40
Naphthalene	1640	D		ug/kg dry	2078.5	678 U	79	40-110	0.7	40
Nitrobenzene	1450	D		ug/kg dry	2078.5	678 U	70	40-105	3	40
N-Nitrosodi-n-propylamine	1740	D		ug/kg dry	2078.5	678 U	84	30-130	3	40
N-Nitrosodiphenylamine	1770	D		ug/kg dry	2078.5	678 U	85	50-120	2	40
Pentachlorophenol	987	D		ug/kg dry	2078.5	3390 U	48	25-120	12	40
Phenanthrene	1780	D		ug/kg dry	2078.5	678 U	86	50-120	0.7	40
Phenol	1700	D		ug/kg dry	2078.5	678 U	82	40-115	2	40
Pyrene	1690	D		ug/kg dry	2078.5	678 U	81	45-125	4	40
Surrogate: 2-Fluorophenol	*1930*			*ug/kg dry*	*2598.1*		*74*	*25-121*		
Surrogate: Phenol-d5	*2110*			*ug/kg dry*	*2598.1*		*81*	*24-113*		
Surrogate: Nitrobenzene-d5	*1240*			*ug/kg dry*	*1732.1*		*72*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1320*			*ug/kg dry*	*1732.1*		*76*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1060*			*ug/kg dry*	*2598.1*		*41*	*19-122*		
Surrogate: p-Terphenyl-d14	*1440*			*ug/kg dry*	*1732.1*		*83*	*18-137*		

PREPARATION BENCH SHEET

L204251

Lionville Laboratory

Printed: 4/24/2012 2:32:10PM

00000053

Matrix: Solid **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1200548**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204065-07	8270C TCL SVOC	04/23/2012 10:44	30	1				500	LQA	LQA
1204070-01	8270C TCL SVOC	04/23/2012 10:44	30.62	1				500	WC-Hanford, Inc.	WCH
L204251-BLK1	QC	04/23/2012 10:44	30	1				500		WCH
L204251-BLK2	QC	04/23/2012 10:44	30	1				500		LQA
L204251-BS1	QC	04/23/2012 10:44	30	1	1200337		600	500		WCH
L204251-BS2	QC	04/23/2012 10:44	30	1	1200337		600	500		LQA
L204251-MS1	QC	04/23/2012 10:44	30.01	1	1200337	1204070-01	600	500		WCH
L204251-MSD1	QC	04/23/2012 10:44	30.28	1	1200337	1204070-01	600	500		WCH

4/24/12 14:32
Extracts Relinquished By Date

4/24/12 1440
Extracts Received By Date

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 11:34

Analytical Report for TCLP Semivolatiles by SW846 1311/8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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Case Narrative

Client: WC-HANFORD RC-228 K3873
LVL #: 1204070 **Date Received:** 04-19-2012

SEMIVOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 04-17-2012.

The sample and associated QC samples were leached 04-23-2012, extracted 04-24-2012 and analyzed 05-03-2012 according to criteria set forth in Lionville Laboratory SOPs. The leaching procedure was based on SW846 Method 1311, the extraction procedure was based on SW846 Method 3520C, and the analysis procedure was based on SW846 Method 8270C.

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

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

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

3. Non-target compounds were detected, but not reported in these samples.

4. The samples were extracted at 5-fold dilutions due to the leachate matrix; however, all TCLP regulatory limits were achieved. Reporting limits have been adjusted to reflect the necessary dilutions.

5. Three (3) of thirty-six (36) surrogate recoveries were outside acceptance criteria. The surrogate recovery criteria were not met for sample L204278-BLK1, however, the BS1 and BLK2 were within acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12MS094) has been enclosed.

6. The method blanks were below the reporting limit for all target compounds.

7. All blank spike recoveries were within acceptance criteria.

8. All matrix spike recoveries were within acceptance criteria.

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.

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

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.

12. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

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

Iain Daniels
LvL Laboratory Manager

5/8/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12M5094

Initiator: Shannon Saylor
Date: 5-7-12
Client: Williamsport R2228 K3873

Batch: 1204070
Samples: L204278-BLK1
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: leachate
Prep Batch: L204278

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-Fluorophenol, nitrobenzene-d5, & 2-Fluorobiphenyl in L204278-BLK1 (BS1, BLK2 within criteria) RCG 5/7/12

2. Known or Probable Causes(s) All early eluting surrogates low or below QC acceptance criteria possible low during sample concentration on Nevap (may have been concentrated too fast). Later eluting surrogates within criteria. All samples and other related QC all within criteria RCG 5/7/12

3. Discussion and Proposed Action Other Description:

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

none

4. Project Manager Instructions...signature/date: 5/8/12

✓ 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: JES 5-8-12 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

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 concetration 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 quan 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 quan modifications:

MP	-	Missed Peak: Manually added peak not found by automatic quan program.
PA	-	Peak Assignment: quan 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 signal., or other interference.
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/07/2012 11:34

J1P0W3
1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
TCLP Semivolatiles by SW846 1311/8270C									
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
2-Methylphenol	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Hexachlorobenzene	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Hexachlorobutadiene	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Hexachloroethane	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Nitrobenzene	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Pentachlorophenol	0.125	U	0.125	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Pyridine	0.0500	U	0.0500	mg/L	1	L204278	04/24/2012	05/03/2012	8270C
Surrogate: 2-Fluorophenol	*57 %*		*21-100*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*
Surrogate: Phenol-d5	*62 %*		*10-94*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*62 %*		*35-114*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*56 %*		*43-116*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*53 %*		*10-123*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*77 %*		*33-141*			*L204278*	*04/24/2012*	*05/03/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 11:34

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204278 - SW 3520C										
Blank (L204278-BLK1)				Prepared: 04/24/2012 Analyzed: 05/03/2012						
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L						
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L						
2-Methylphenol	0.0500	U	0.0500	mg/L						
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L						
Hexachlorobenzene	0.0500	U	0.0500	mg/L						
Hexachlorobutadiene	0.0500	U	0.0500	mg/L						
Hexachloroethane	0.0500	U	0.0500	mg/L						
Nitrobenzene	0.0500	U	0.0500	mg/L						
Pentachlorophenol	0.125	U	0.125	mg/L						
Pyridine	0.0500	U	0.0500	mg/L						
Surrogate: 2-Fluorophenol	*0.0273*			*mg/L*	*0.37500*		*7**	*21-100*		
Surrogate: Phenol-d5	*0.0616*			*mg/L*	*0.37500*		*16*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.0344*			*mg/L*	*0.25000*		*14**	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.0849*			*mg/L*	*0.25000*		*34**	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.188*			*mg/L*	*0.37500*		*50*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.199*			*mg/L*	*0.25000*		*80*	*33-141*		
Blank (L204278-BLK2)				Prepared: 04/24/2012 Analyzed: 05/03/2012						
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L						
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L						
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L						
2-Methylphenol	0.0500	U	0.0500	mg/L						
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L						
Hexachlorobenzene	0.0500	U	0.0500	mg/L						
Hexachlorobutadiene	0.0500	U	0.0500	mg/L						
Hexachloroethane	0.0500	U	0.0500	mg/L						
Nitrobenzene	0.0500	U	0.0500	mg/L						
Pentachlorophenol	0.125	U	0.125	mg/L						
Pyridine	0.0500	U	0.0500	mg/L						
Surrogate: 2-Fluorophenol	*0.205*			*mg/L*	*0.37500*		*55*	*21-100*		
Surrogate: Phenol-d5	*0.221*			*mg/L*	*0.37500*		*59*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.134*			*mg/L*	*0.25000*		*53*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.128*			*mg/L*	*0.25000*		*51*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.154*			*mg/L*	*0.37500*		*41*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.174*			*mg/L*	*0.25000*		*70*	*33-141*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 11:34

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204278 - SW 3520C									
LCS (L204278-BS1)			Prepared: 04/24/2012 Analyzed: 05/03/2012						
1,4-Dichlorobenzene	0.140	0.0500	mg/L	0.30000		47	30-100		
2,4,5-Trichlorophenol	0.213	0.0500	mg/L	0.30000		71	45-125		
2,4,6-Trichlorophenol	0.188	0.0500	mg/L	0.30000		63	40-125		
2,4-Dinitrotoluene	0.234	0.0500	mg/L	0.30000		78	50-120		
2-Methylphenol	0.206	0.0500	mg/L	0.30000		69	40-110		
3- and/or 4-Methylphenol	0.205	0.0500	mg/L	0.30000		68	30-110		
Hexachlorobenzene	0.169	0.0500	mg/L	0.30000		56	50-110		
Hexachlorobutadiene	0.120	0.0500	mg/L	0.30000		40	30-100		
Hexachloroethane	0.130	0.0500	mg/L	0.30000		43	25-100		
Nitrobenzene	0.177	0.0500	mg/L	0.30000		59	40-110		
Pentachlorophenol	0.182	0.125	mg/L	0.30000		61	20-130		
Pyridine	0.163	0.0500	mg/L	0.30000		54	5-100		
Surrogate: 2-Fluorophenol	*0.229*		*mg/L*	*0.37500*		*61*	*21-100*		
Surrogate: Phenol-d5	*0.247*		*mg/L*	*0.37500*		*66*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.154*		*mg/L*	*0.25000*		*61*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.149*		*mg/L*	*0.25000*		*60*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.213*		*mg/L*	*0.37500*		*57*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.184*		*mg/L*	*0.25000*		*73*	*33-141*		
Matrix Spike (L204278-MS1)		**Source: 1204070-01**	Prepared: 04/24/2012 Analyzed: 05/03/2012						
1,4-Dichlorobenzene	0.127	0.0500	mg/L	0.30000	0.0500 U	42	30-100		
2,4,5-Trichlorophenol	0.221	0.0500	mg/L	0.30000	0.0500 U	74	45-125		
2,4,6-Trichlorophenol	0.191	0.0500	mg/L	0.30000	0.0500 U	64	40-125		
2,4-Dinitrotoluene	0.218	0.0500	mg/L	0.30000	0.0500 U	73	50-120		
2-Methylphenol	0.205	0.0500	mg/L	0.30000	0.0500 U	68	40-110		
3- and/or 4-Methylphenol	0.201	0.0500	mg/L	0.30000	0.0500 U	67	30-110		
Hexachlorobenzene	0.176	0.0500	mg/L	0.30000	0.0500 U	59	50-110		
Hexachlorobutadiene	0.129	0.0500	mg/L	0.30000	0.0500 U	43	30-100		
Hexachloroethane	0.114	0.0500	mg/L	0.30000	0.0500 U	38	25-100		
Nitrobenzene	0.172	0.0500	mg/L	0.30000	0.0500 U	57	40-110		
Pentachlorophenol	0.236	0.125	mg/L	0.30000	0.125 U	79	20-130		
Pyridine	0.177	0.0500	mg/L	0.30000	0.0500 U	59	5-100		
Surrogate: 2-Fluorophenol	*0.217*		*mg/L*	*0.37500*		*58*	*21-100*		
Surrogate: Phenol-d5	*0.249*		*mg/L*	*0.37500*		*66*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.155*		*mg/L*	*0.25000*		*62*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.159*		*mg/L*	*0.25000*		*64*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.233*		*mg/L*	*0.37500*		*62*	*10-123*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/07/2012 11:34

TCLP Semivolatiles by SW846 1311/8270C - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204278 - SW 3520C									
Matrix Spike (L204278-MS1)		**Source: 1204070-01**		Prepared: 04/24/2012 Analyzed: 05/03/2012					
Surrogate: p-Terphenyl-d14	*0.187*		*mg/L*	*0.25000*		*75*	*33-141*		
Matrix Spike Dup (L204278-MSD1)		**Source: 1204070-01**		Prepared: 04/24/2012 Analyzed: 05/03/2012					
1,4-Dichlorobenzene	0.149	0.0521	mg/L	0.31250	0.0500 U	48	30-100	16	20
2,4,5-Trichlorophenol	0.281	0.0521	mg/L	0.31250	0.0500 U	90	45-125	24*	20
2,4,6-Trichlorophenol	0.243	0.0521	mg/L	0.31250	0.0500 U	78	40-125	24*	20
2,4-Dinitrotoluene	0.268	0.0521	mg/L	0.31250	0.0500 U	86	50-120	20	20
2-Methylphenol	0.272	0.0521	mg/L	0.31250	0.0500 U	87	40-110	28*	20
3- and/or 4-Methylphenol	0.263	0.0521	mg/L	0.31250	0.0500 U	84	30-110	27*	20
Hexachlorobenzene	0.218	0.0521	mg/L	0.31250	0.0500 U	70	50-110	21*	20
Hexachlorobutadiene	0.164	0.0521	mg/L	0.31250	0.0500 U	53	30-100	24*	20
Hexachloroethane	0.134	0.0521	mg/L	0.31250	0.0500 U	43	25-100	16	20
Nitrobenzene	0.237	0.0521	mg/L	0.31250	0.0500 U	76	40-110	32*	20
Pentachlorophenol	0.290	0.130	mg/L	0.31250	0.125 U	93	20-130	21*	20
Pyridine	0.243	0.0521	mg/L	0.31250	0.0500 U	78	5-100	32*	20
Surrogate: 2-Fluorophenol	*0.303*		*mg/L*	*0.39062*		*78*	*21-100*		
Surrogate: Phenol-d5	*0.318*		*mg/L*	*0.39062*		*81*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.207*		*mg/L*	*0.26042*		*79*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.197*		*mg/L*	*0.26042*		*76*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.279*		*mg/L*	*0.39062*		*71*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.210*		*mg/L*	*0.26042*		*81*	*33-141*		

.ionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1101

Start Date: 4-23-12 Start Time: 10:48 Analyst: RH SOP: SPI-1311.1	End Date: 4-24-12 End Time: 4:00 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: 1204244 Leachate Page: 1 of ~~2~~ 1 RH Room Temp. (°C): Start 21 /Finish 21 Acceptance Criteria: 23°C ± 2°

vL #: 1204069-01 Client ID#: JINPM5 H After 5 Min: 6.94 H After Acid/Heat: 1.72 xtraction Fluid/pH: #1 4.90 ample Wt.(g): 25 xtract Fluid Vol.(mL): 500 H After Extraction: 4.99	Initial Filtration Data and Comments: Solids: ____% / NA RAD II Initial Filtrate Added:
vL #: 1204069-02 lient ID#: JINPM7 H After 5 Min: 7.52 H After Acid/Heat: 1.97 xtraction Fluid/pH: #1 4.90 ample Wt.(g): 25 xtract Fluid Vol.(mL): 500 H After Extraction: 5.04	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added:
vL # 1204070-01 lient ID#: JIPOW3 H After 5 Min: 8.74 H After Acid/Heat: 1.70 xtraction Fluid/pH: #1 4.90 ample Wt.(g): 50 xtract Fluid Vol.(mL): 1000 H After Extraction: 5.03	Initial Filtration Data and Comments: Solids: ____% / NA RAD I Initial Filtrate Added:
/L #: L2042244 lient ID#: H After 5 Min: N/A H After Acid/Heat: xtraction Fluid/pH: ample Wt.(g): N/A xtract Fluid Vol.(mL): H After Extraction:	Initial Filtration Data and Comments: Solids: ____% / NA Blank Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date Qjm 4/26/12

SPI-1311.1-A-0310

Page #

PREPARATION BENCH SHEET

L204278

Lionville Laboratory

Printed: 4/26/2012 4:26:49PM

00000066

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1200548**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204070-01	1311/8270C TCLP SVOC	04/24/2012 15:50	200	1				500	WC-Hanford, Inc.	
L204278-BLK1	QC	04/24/2012 15:50	200	1				500		
L204278-BLK2	QC	04/24/2012 15:50	200	1				500		LTO L204244
L204278-BS1	QC	04/24/2012 15:50	200	1	1200337		600	500		
L204278-MS1	QC	04/24/2012 15:50	200	1	1200337	1204070-01	600	500		
L204278-MSD1	QC	04/24/2012 15:50	192	1	1200337	1204070-01	600	500		

Extracts Relinquished By 4/26/12 1640 Date

Extracts Received By 4/26/12 1645 Date

PCBS

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/06/2012 07:05

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Received: 04-19-2012

PCBs

One (1) soil sample was collected on 04-17-2012.

The sample and associated QC samples were extracted 04-23-2012 and analyzed 04-30-2012 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.

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9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

5/10/12
Date

r:\group\data\2012\pcb\wc hanford\templateoj_s1.doc

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

GLOSSARY OF DATA

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E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.
. I	=	Indicates an interference on one analytical column only. Result is reported from remaining analytical column.
P	=	This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
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MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/06/2012 07:05

J1P0W3

1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1221	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1232	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1242	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1248	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1254	**10.3**	J	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1260	**5.12**	J	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1262	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Aroclor 1268	20.0	U	20.0	ug/kg dry	1	L204250	04/23/2012	04/30/2012	8082
Surrogate: Decachlorobiphenyl	*79 %*		*43-144*			*L204250*	*04/23/2012*	*04/30/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*105 %*		*52-141*			*L204250*	*04/23/2012*	*04/30/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/06/2012 07:05

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 L204250 - SW 3540C										
Blank (L204250-BLK1)				Prepared: 04/23/2012 Analyzed: 04/30/2012						
Aroclor 1016	13.3	U	13.3	ug/kg wet						
Aroclor 1221	13.3	U	13.3	ug/kg wet						
Aroclor 1232	13.3	U	13.3	ug/kg wet						
Aroclor 1242	13.3	U	13.3	ug/kg wet						
Aroclor 1248	13.3	U	13.3	ug/kg wet						
Aroclor 1254	13.3	U	13.3	ug/kg wet						
Aroclor 1260	13.3	U	13.3	ug/kg wet						
Aroclor 1262	13.3	U	13.3	ug/kg wet						
Aroclor 1268	13.3	U	13.3	ug/kg wet						
Surrogate: Decachlorobiphenyl	*23.1*			*ug/kg wet*	*33.333*		*69*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*33.6*			*ug/kg wet*	*33.337*		*101*	*52-141*		
LCS (L204250-BS1)				Prepared: 04/23/2012 Analyzed: 04/30/2012						
Aroclor 1016	143		13.3	ug/kg wet	166.67		86	50-138		
Aroclor 1260	146		13.3	ug/kg wet	166.67		87	50-148		
Surrogate: Decachlorobiphenyl	*26.5*			*ug/kg wet*	*33.333*		*80*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.1*			*ug/kg wet*	*33.337*		*105*	*52-141*		
Matrix Spike (L204250-MS2)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 04/30/2012						
Aroclor 1016	220		20.7	ug/kg dry	259.77	20.0 U	85	50-138		
Aroclor 1260	219		20.7	ug/kg dry	259.77	5.12	82	50-148		
Surrogate: Decachlorobiphenyl	*39.0*			*ug/kg dry*	*51.953*		*75*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*52.4*			*ug/kg dry*	*51.959*		*101*	*52-141*		
Matrix Spike Dup (L204250-MSD2)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 04/30/2012						
Aroclor 1016	234		20.4	ug/kg dry	255.46	20.0 U	92	50-138	8	40
Aroclor 1260	232		20.4	ug/kg dry	255.46	5.12	89	50-148	8	40
Surrogate: Decachlorobiphenyl	*40.9*			*ug/kg dry*	*51.093*		*80*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*54.7*			*ug/kg dry*	*51.098*		*107*	*52-141*		

PREPARATION BENCH SHEET

L204250

Lionville Laboratory

Printed: 4/24/2012 2:15:12PM

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200502**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204064-01	8082 PCBs	04/23/2012 10:31	11.11	10				250	WC-Hanford, Inc.	
1204065-11	8082 PCBs	04/23/2012 10:31	30	10				250	LQA	
1204070-01	8082 PCBs	04/23/2012 10:31	20.89	10				250	WC-Hanford, Inc.	
L204250-BLK1	QC	04/23/2012 10:31	30	10				250		
L204250-BS1	QC	04/23/2012 10:31	30	10	1200123		250	250		
L204250-MS1	QC	04/23/2012 10:31	10.45	10	1200123	1204064-01	250	250		
L204250-MS2	QC	04/23/2012 10:31	20.19	10	1200123	1204070-01	250	250		
L204250-MSD1	QC	04/23/2012 10:31	10.37	10	1200123	1204064-01	250	250		
L204250-MSD2	QC	04/23/2012 10:31	20.53	10	1200123	1204070-01	250	250		

4/24/12 1435 LK 4-24-12

Extracts Relinquished By Date Extracts Received By Date

DIESEL

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-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 19:06

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Date Received: 04-19-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 04-17-2012.

The sample and associated QC samples were extracted 04-23-2012 and analyzed 04-25-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

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

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7. All initial calibrations associated with this data set were within acceptance criteria.
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9. The sample was reported on a dry weight basis.
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Iain Daniels
LvL Laboratory Manager

4/30/12
Date

r:\group\data\2012\dro\wc hanford\1204070jes.doc

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LIONVILLE LABORATORY INC.

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J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

.I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

P = This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

NS = Not Spiked.

SP = Indicates Spiked Compound.

NPM = No pattern match for multi-component target analytes.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 19:06

J1P0W3

1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	3480	U	3480	ug/kg dry	1	L204268	04/23/2012	04/25/2012	8015M
Motor Oil	**5300**	J	10400	ug/kg dry	1	L204268	04/23/2012	04/25/2012	8015M
Surrogate: p-Terphenyl	*79 %*		*39-129*			*L204268*	*04/23/2012*	*04/25/2012*	*8015M*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 19:06

Extractable Petroleum Hydrocarbons by SW846 8015 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204268 - SW 3540C										
Blank (L204268-BLK1)				Prepared: 04/23/2012 Analyzed: 04/25/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*5140*			*ug/kg wet*	*6666.7*		*77*	*39-129*		
LCS (L204268-BS1)				Prepared: 04/23/2012 Analyzed: 04/25/2012						
Diesel Range Organics	42100		3330	ug/kg wet	66667		63	42-133		40
Surrogate: p-Terphenyl	*4740*			*ug/kg wet*	*6666.7*		*71*	*39-129*		
Matrix Spike (L204268-MS1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 04/25/2012						
Diesel Range Organics	62000		3490	ug/kg dry	69743	3480 U	89	42-133		40
Surrogate: p-Terphenyl	*6180*			*ug/kg dry*	*6974.3*		*89*	*39-129*		
Matrix Spike Dup (L204268-MSD1)		**Source: 1204070-01**		Prepared: 04/23/2012 Analyzed: 04/25/2012						
Diesel Range Organics	52900		3470	ug/kg dry	69397	3480 U	76	42-133	15	40
Surrogate: p-Terphenyl	*5430*			*ug/kg dry*	*6939.7*		*78*	*39-129*		

PREPARATION BENCH SHEET

L204268

Lionville Laboratory

Printed: 4/24/2012 2:14:02PM

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 1200549

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204065-17	8015M DRO	04/23/2012 14:09	30	1				1000	LQA	
1204070-01	8015M DRO	04/23/2012 14:09	30.17	1				1000	WC-Hanford, Inc.	
L204268-BLK1	QC	04/23/2012 14:09	30	1				1000		
L204268-BS1	QC	04/23/2012 14:09	30	1	1101936		1000	1000		
L204268-MS1	QC	04/23/2012 14:09	30.08	1	1101936	1204070-01	1000	1000		
L204268-MSD1	QC	04/23/2012 14:09	30.23	1	1101936	1204070-01	1000	1000		

1425

4/24/12

Extracts Relinquished By — Date

LC

Extracts Received By

4-24-12

Date

PAHs

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/09/2012 21:28

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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-228 K3873
LVL #: 1204070

W.O. #: 60049-001-001-0001-00
Date Received: 04-19-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 04-17-2012.

The sample and associated QC samples were extracted 04-23-2012 and analyzed 05-08-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8310.

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9. The sample was reported on a dry weight basis.
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Iain Daniels
LvL Laboratory Manager

5/10/12
Date

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LIONVILLE LABORATORY INC.

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NS	=	Not Spiked.
SP	=	Indicates Spiked Compound.
NPM	=	No pattern match for multi-component target analytes.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/09/2012 21:28

J1P0W3

1204070-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Acenaphthylene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Acenaphthene	**1.51**	J	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Fluorene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Phenanthrene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Anthracene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Fluoranthene	**1.13**	J	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Indeno[1,2,3-cd]pyrene	**4.23**		3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Pyrene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Benz[a]anthracene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Chrysene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Benzo[b] fluoranthene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Benzo[k] fluoranthene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Benzo[a] pyrene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Dibenz[a,h]anthracene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Benzo[g,h,i] perylene	3.42	U	3.42	ug/kg dry	1	L204259	04/23/2012	05/08/2012	8310
Surrogate: Triphenylene	*91 %*		*68-129*			*L204259*	*04/23/2012*	*05/08/2012*	*8310*

LIONVILLE LABORATORY
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/09/2012 21:28

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204259 - SW 3540C										
Blank (L204259-BLK1)				Prepared: 04/23/2012 Analyzed: 05/08/2012						
Naphthalene	3.33	U	3.33	ug/kg wet						
Acenaphthylene	3.33	U	3.33	ug/kg wet						
Acenaphthene	3.33	U	3.33	ug/kg wet						
Fluorene	0.917	J	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*158*			*ug/kg wet*	*166.67*		*95*	*68-129*		
LCS (L204259-BS1)				Prepared: 04/23/2012 Analyzed: 05/08/2012						
Naphthalene	187		3.33	ug/kg wet	166.67		112	0-127		
Acenaphthylene	152		3.33	ug/kg wet	166.67		91	50-140		
Acenaphthene	150		3.33	ug/kg wet	166.67		90	17-139		
Fluorene	154		3.33	ug/kg wet	166.67		92	28-145		
Phenanthrene	162		3.33	ug/kg wet	166.67		97	30-152		
Anthracene	128		3.33	ug/kg wet	166.67		77	19-171		
Fluoranthene	160		3.33	ug/kg wet	166.67		96	34-159		
Indeno[1,2,3-cd]pyrene	166		3.33	ug/kg wet	166.67		99	31-156		
Pyrene	159		3.33	ug/kg wet	166.67		95	33-152		
Benz[a]anthracene	166		3.33	ug/kg wet	166.67		99	32-157		
Chrysene	159		3.33	ug/kg wet	166.67		96	31-159		
Benzo[b] fluoranthene	164		3.33	ug/kg wet	166.67		98	33-164		
Benzo[k] fluoranthene	160		3.33	ug/kg wet	166.67		96	28-161		
Benzo[a] pyrene	202		3.33	ug/kg wet	166.67		121	29-149		
Dibenz[a,h]anthracene	151		3.33	ug/kg wet	166.67		91	27-153		
Benzo[g,h,i] perylene	170		3.33	ug/kg wet	166.67		102	32-157		
Surrogate: Triphenylene	*162*			*ug/kg wet*	*166.67*		*97*	*68-129*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 05/09/2012 21:28

Polynuclear Aromatic Compounds by SW846 8310 - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204259 - SW 3540C									
Matrix Spike (L204259-MS1)		**Source: 1204070-01**	Prepared: 04/23/2012 Analyzed: 05/08/2012						
Naphthalene	171	3.42	ug/kg dry	171.23	3.42 U	100	0-127		
Acenaphthylene	140	3.42	ug/kg dry	171.23	3.42 U	82	50-140		
Acenaphthene	128	3.42	ug/kg dry	171.23	1.51	74	17-139		
Fluorene	141	3.42	ug/kg dry	171.23	3.42 U	83	28-145		
Phenanthrene	147	3.42	ug/kg dry	171.23	3.42 U	86	30-152		
Anthracene	117	3.42	ug/kg dry	171.23	3.42 U	68	19-171		
Fluoranthene	142	3.42	ug/kg dry	171.23	1.13	82	34-159		
Indeno[1,2,3-cd]pyrene	153	3.42	ug/kg dry	171.23	4.23	87	31-156		
Pyrene	140	3.42	ug/kg dry	171.23	3.42 U	82	33-152		
Benz[a]anthracene	145	3.42	ug/kg dry	171.23	3.42 U	85	32-157		
Chrysene	139	3.42	ug/kg dry	171.23	3.42 U	81	31-159		
Benzo[b] fluoranthene	137	3.42	ug/kg dry	171.23	3.42 U	80	33-164		
Benzo[k] fluoranthene	140	3.42	ug/kg dry	171.23	3.42 U	82	28-161		
Benzo[a] pyrene	188	3.42	ug/kg dry	171.23	3.42 U	110	29-149		
Dibenz[a,h]anthracene	133	3.42	ug/kg dry	171.23	3.42 U	77	27-153		
Benzo[g,h,i] perylene	143	3.42	ug/kg dry	171.23	3.42 U	83	32-157		
Surrogate: Triphenylene	*144*		*ug/kg dry*	*171.23*		*84*	*68-129*		
Matrix Spike Dup (L204259-MSD1)		**Source: 1204070-01**	Prepared: 04/23/2012 Analyzed: 05/08/2012						
Naphthalene	187	3.47	ug/kg dry	173.44	3.42 U	108	0-127	8	40
Acenaphthylene	157	3.47	ug/kg dry	173.44	3.42 U	91	50-140	10	40
Acenaphthene	144	3.47	ug/kg dry	173.44	1.51	82	17-139	11	40
Fluorene	156	3.47	ug/kg dry	173.44	3.42 U	90	28-145	8	40
Phenanthrene	166	3.47	ug/kg dry	173.44	3.42 U	96	30-152	11	40
Anthracene	132	3.47	ug/kg dry	173.44	3.42 U	76	19-171	11	40
Fluoranthene	162	3.47	ug/kg dry	173.44	1.13	93	34-159	12	40
Indeno[1,2,3-cd]pyrene	168	3.47	ug/kg dry	173.44	4.23	95	31-156	9	40
Pyrene	157	3.47	ug/kg dry	173.44	3.42 U	91	33-152	11	40
Benz[a]anthracene	167	3.47	ug/kg dry	173.44	3.42 U	96	32-157	13	40
Chrysene	157	3.47	ug/kg dry	173.44	3.42 U	90	31-159	11	40
Benzo[b] fluoranthene	156	3.47	ug/kg dry	173.44	3.42 U	90	33-164	11	40
Benzo[k] fluoranthene	159	3.47	ug/kg dry	173.44	3.42 U	92	28-161	11	40
Benzo[a] pyrene	212	3.47	ug/kg dry	173.44	3.42 U	122	29-149	11	40
Dibenz[a,h]anthracene	151	3.47	ug/kg dry	173.44	3.42 U	87	27-153	12	40
Benzo[g,h,i] perylene	163	3.47	ug/kg dry	173.44	3.42 U	94	32-157	12	40
Surrogate: Triphenylene	*163*		*ug/kg dry*	*173.44*		*94*	*68-129*		

PREPARATION BENCH SHEET

L204259

Lionville Laboratory

Printed: 4/24/2012 1:50:23PM

Matrix: Solid

Prepared using: HPLC - SW 3540C

Surrogate used: 1200438

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204065-13	8310 PAH	04/23/2012 13:33	30	5				50	LQA	
1204070-01	8310 PAH	04/23/2012 13:33	30.6	5				50	WC-Hanford, Inc.	
L204259-BLK1	QC	04/23/2012 13:33	30	5				50		
L204259-BS1	QC	04/23/2012 13:33	30	5	1200436		50	50		
L204259-MS1	QC	04/23/2012 13:33	30.63	5	1200436	1204070-01	50	50		
L204259-MSD1	QC	04/23/2012 13:33	30.24	5	1200436	1204070-01	50	50		

4/24/12 1435 UC 4-24-12

Extracts Relinquished By Date Extracts Received By Date

METALS

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

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Case Narrative

Client: WC-HANFORD RC-228
LVL#: 1204070
SDG/SAF#: K3873/RC-228

W.O.#: 60049-001-001-0001-00
Date Received: 04-19-12

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 analyses of 1 soil sample.
2. The samples were prepared and analyzed in accordance with methods listed on the data report forms.
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, or samples greater than 20X MB value}.
8. All ICP Interference Check Standards were within control limits.
9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.
10. The soil matrix spike (MS) recoveries for 18 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 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
J1P0W3	Aluminum	22,000	67.4
	Antimony	100	82.7
	Beryllium	100	82.6
	Boron	100	85.6
	Calcium	20,800	43.3
	Chromium	100	83.7
	Cobalt	100	79.2
	Copper	100	79.7
	Iron	42,000	35.7
	Lead	100	72.2
	Magnesium	41,600	51.9
	Manganese	1,000	53.4
	Nickel	100	76.9
	Potassium	2,000	71.0
	Selenium	100	84.9
	Silicon	2,100	94.7
	Sodium	2,000	92.3
	Vanadium	1,000	70.4

12. The soil duplicate analyses for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Cadmium 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

5/11/12
Date

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

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-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

J1P0W3
1204070-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**5690**		3.50	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Antimony	0.420	U	0.420	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Arsenic	**2.47**		0.699	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Barium	**53.6**		0.350	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Beryllium	**0.217**		0.140	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Boron	**0.971**	B	1.40	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Cadmium	**0.0875**	B	0.140	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Calcium	**5330**		69.9	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Chromium	**9.51**		0.140	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Cobalt	**4.30**		1.40	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Copper	**8.43**		0.699	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Iron	**15700**		14.0	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Lead	**3.11**		0.350	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Magnesium	**3640**		52.4	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Manganese	**232**		3.50	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Molybdenum	**0.264**	B	1.40	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Nickel	**9.78**		2.80	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Potassium	**915**		280	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Selenium	0.210	U	0.210	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Silicon	**290**		1.40	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Silver	0.140	U	0.140	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Sodium	**189**		35.0	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Vanadium	**43.5**		1.75	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Zinc	**32.9**		6.99	mg/kg dry	1	L204276	04/24/2012	04/25/2012	6010B
Mercury	0.0270	U	0.0270	mg/kg dry	1	L204219	04/19/2012	04/20/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

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 L204219 - SW 7471A Prep										
Blank (L204219-BLK1)				Prepared: 04/19/2012 Analyzed: 04/20/2012						
Mercury	0.0300	U	0.0300	mg/kg wet						
Duplicate (L204219-DUP4)		**Source: 1204070-01**		Prepared: 04/19/2012 Analyzed: 04/20/2012						
Mercury	0.0278	U	0.0278	mg/kg dry		0.0270 U				20
Matrix Spike (L204219-MS4)		**Source: 1204070-01**		Prepared: 04/19/2012 Analyzed: 04/20/2012						
Mercury	0.163		0.0262	mg/kg dry	0.14569	0.0270 U	112	75-125		20
Reference (L204219-SRM1)				Prepared: 04/19/2012 Analyzed: 04/20/2012						
Mercury	1.23		0.0281	mg/kg wet	1.2900		95.7	62.6-138		
Batch L204276 - SW 3050B										
Blank (L204276-BLK1)				Prepared: 04/24/2012 Analyzed: 04/25/2012						
Aluminum	3.47	U	3.47	mg/kg wet						
Antimony	0.417	U	0.417	mg/kg wet						
Arsenic	0.694	U	0.694	mg/kg wet						
Barium	0.347	U	0.347	mg/kg wet						
Beryllium	0.139	U	0.139	mg/kg wet						
Boron	1.39	U	1.39	mg/kg wet						
Cadmium	0.139	U	0.139	mg/kg wet						
Calcium	5.21	B	69.4	mg/kg wet						
Chromium	0.139	U	0.139	mg/kg wet						
Cobalt	1.39	U	1.39	mg/kg wet						
Copper	0.694	U	0.694	mg/kg wet						
Iron	13.9	U	13.9	mg/kg wet						
Lead	0.347	U	0.347	mg/kg wet						
Magnesium	0.708	B	52.1	mg/kg wet						
Manganese	3.47	U	3.47	mg/kg wet						
Molybdenum	1.39	U	1.39	mg/kg wet						
Nickel	2.78	U	2.78	mg/kg wet						
Potassium	278	U	278	mg/kg wet						
Selenium	0.208	U	0.208	mg/kg wet						
Silicon	1.39	U	1.39	mg/kg wet						
Silver	0.139	U	0.139	mg/kg wet						
Sodium	34.7	U	34.7	mg/kg wet						
Vanadium	1.74	U	1.74	mg/kg wet						
Zinc	6.94	U	6.94	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

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 L204276 - SW 3050B										
Duplicate (L204276-DUP1)		**Source: 1204070-01**		Prepared: 04/24/2012 Analyzed: 04/25/2012						
Aluminum	5980		4.68	mg/kg dry		5690			5	20
Antimony	0.562	U	0.562	mg/kg dry		0.420 U				20
Arsenic	2.52		0.937	mg/kg dry		2.47			2	20
Barium	80.4		0.468	mg/kg dry		53.6			40*	20
Beryllium	0.249		0.187	mg/kg dry		0.217			13	20
Boron	1.02	B	1.87	mg/kg dry		0.971			4	20
Cadmium	0.126	B	0.187	mg/kg dry		0.0875			36*	20
Calcium	4030		93.7	mg/kg dry		5330			28*	20
Chromium	8.59		0.187	mg/kg dry		9.51			10	20
Cobalt	4.95		1.87	mg/kg dry		4.30			14	20
Copper	9.67		0.937	mg/kg dry		8.43			14	20
Iron	16500		18.7	mg/kg dry		15700			5	20
Lead	3.33		0.468	mg/kg dry		3.11			7	20
Magnesium	3940		70.2	mg/kg dry		3640			8	20
Manganese	301		4.68	mg/kg dry		232			26*	20
Molybdenum	0.286	B	1.87	mg/kg dry		0.264			8	20
Nickel	9.09		3.75	mg/kg dry		9.78			7	20
Potassium	998		375	mg/kg dry		915			9	20
Selenium	0.281	U	0.281	mg/kg dry		0.210 U				20
Silicon	410		1.87	mg/kg dry		290			34*	20
Silver	0.187	U	0.187	mg/kg dry		0.140 U				20
Sodium	195		46.8	mg/kg dry		189			3	20
Vanadium	44.2		2.34	mg/kg dry		43.5			1	20
Zinc	36.1		9.37	mg/kg dry		32.9			9	20
Matrix Spike (L204276-MS1)		**Source: 1204070-01**		Prepared: 04/24/2012 Analyzed: 04/25/2012						
Aluminum	5300		3.91	mg/kg dry	156.56	5690	-246*	75-125		20
Antimony	12.9		0.470	mg/kg dry	39.139	0.420 U	33*	75-125		20
Arsenic	121		0.783	mg/kg dry	156.56	2.47	76	75-125		20
Barium	173		0.391	mg/kg dry	156.56	53.6	76	75-125		20
Beryllium	3.05		0.157	mg/kg dry	3.9139	0.217	72*	75-125		20
Boron	58.1		1.57	mg/kg dry	78.279	0.971	73*	75-125		20
Cadmium	3.26		0.157	mg/kg dry	3.9139	0.0875	81	75-125		20
Calcium	5160		78.3	mg/kg dry	1957.0	5330	-8*	75-125		20
Chromium	20.1		0.157	mg/kg dry	15.656	9.51	68*	75-125		20
Cobalt	32.1		1.57	mg/kg dry	39.139	4.30	71*	75-125		20
Copper	22.2		0.783	mg/kg dry	19.570	8.43	70*	75-125		20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

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 L204276 - SW 3050B									
Matrix Spike (L204276-MS1)		**Source: 1204070-01**	Prepared: 04/24/2012 Analyzed: 04/25/2012						
Iron	14000	15.7	mg/kg dry	78.279	15700	-2200*	75-125		20
Lead	28.7	0.391	mg/kg dry	39.139	3.11	65*	75-125		20
Magnesium	4710	58.7	mg/kg dry	1957.0	3640	55*	75-125		20
Manganese	236	3.91	mg/kg dry	39.139	232	10*	75-125		20
Molybdenum	60.3	1.57	mg/kg dry	78.279	0.264	77	75-125		20
Nickel	34.6	3.13	mg/kg dry	39.139	9.78	63*	75-125		20
Potassium	2230	313	mg/kg dry	1957.0	915	67*	75-125		20
Selenium	115	0.235	mg/kg dry	156.56	0.210 U	74*	75-125		20
Silicon	287	1.57	mg/kg dry	78.279	290	-4*	75-125		20
Silver	2.98	0.157	mg/kg dry	3.9139	0.140 U	76	75-125		20
Sodium	1640	39.1	mg/kg dry	1957.0	189	74*	75-125		20
Vanadium	66.5	1.96	mg/kg dry	39.139	43.5	59*	75-125		20
Zinc	77.7	7.83	mg/kg dry	39.139	32.9	115	75-125		20
Reference (L204276-SRM1)			Prepared: 04/24/2012 Analyzed: 04/25/2012						
Aluminum	10400	14.7	mg/kg wet	6670.0		156	0-200.89		
Antimony	55.6	1.76	mg/kg wet	53.000		105	0-235.8		
Arsenic	116	2.94	mg/kg wet	114.00		102	82.8-117.54		
Barium	314	1.47	mg/kg wet	307.00		102	79.8-120.2		
Beryllium	105	0.588	mg/kg wet	108.00		97	82.8-117.6		
Boron	87.9	5.88	mg/kg wet	85.100		103	67.5-132.8		
Cadmium	232	0.588	mg/kg wet	225.00		103	83.6-116.4		
Calcium	3070	294	mg/kg wet	3360.0		91	83.3-116.9		
Chromium	84.2	0.588	mg/kg wet	77.200		109	73.3-126.4		
Cobalt	162	5.88	mg/kg wet	166.00		97	80.7-118.7		
Copper	262	2.94	mg/kg wet	271.00		97	80.8-119.2		
Iron	8210	58.8	mg/kg wet	8420.0		98	78.6-121.1		
Lead	180	1.47	mg/kg wet	190.00		95	81.6-118.4		
Magnesium	9330	221	mg/kg wet	8570.0		109	83.2-116.7		
Manganese	987	14.7	mg/kg wet	965.00		102	69.3-130.5		
Molybdenum	246	5.88	mg/kg wet	235.00		105	76.2-123.8		
Nickel	221	11.8	mg/kg wet	221.00		100	79.6-120.8		
Potassium	13700	1180	mg/kg wet	14400		95	81.9-118.1		
Selenium	191	0.882	mg/kg wet	187.00		102	75.9-124.6		
Silicon	440	5.88	mg/kg wet	807.00		55	0-219.3		
Silver	83.4	0.588	mg/kg wet	83.500		100	82.7-117.1		
Sodium	9240	147	mg/kg wet	9730.0		95	82.5-117.2		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3873 Project Manager: Joan Kessner	**Reported:** 04/26/2012 11:38

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 L204276 - SW 3050B									
Reference (L204276-SRM1)				Prepared: 04/24/2012 Analyzed: 04/25/2012					
Vanadium	101	7.35	mg/kg wet	98.700		103	75.9-123.6		
Zinc	204	29.4	mg/kg wet	199.00		102	78.4-121.6		

Lionville Laboratory

Logbook #: 1111

SAMPLE DIGESTION RECORD

Digestion Batch #: L204276
Date/Time Initiated: 4/24/12 1010
Date/Time Completed: 4/24/12 1640
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A ~~3050~~ 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 96
BLOCK 1 2 3 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1204070 01		0.75	50		TO	Fine	Brown	Rocks	N/A
L204276-Bn1		0.56	50						
-M1	0.5	0.67	50						
-M4		0.72	50			Coarse	Boiling Chips		
-SM1		0.51	50			Fine	pinksand		

JJS
4/24/12

Spiking IDs / Expiration Date:
MS#: 1200457
LCS#: 1101357

Reagent IDs:
HNO_3 K49027
HCl L01031
H_2O_2 K09A07
1:1 HNO_3 637-066-09
1:1 HCl

File ID#:

Data Review By/Date: 4/25/12

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Signed\SPI\Metals Digestion log.doc

Page #:

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Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 4/19/12
Start Time/Temp: 1740/95
End Time/Temp: 1810/97

Instrument ID: HG31
Balance # B29 /NA
Pipette Calibration (Daily) (Y)

Logbook # 1094
Prep Batch: L204219
Worksheet: HG042001
SOP No. ME-HgCVAA
BLOCK 1 2 (circle one) (3)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10ml	50	
0.2 µg/l		0.100		10ml	50	
1.0 µg/l		0.500		10ml	50	
2.0 µg/l		1.000		10ml	50	
5.0 µg/l		2.500		10ml	50	
10.0 µg/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L204219-BLK1				0.30	50	
SRM1		(*)	(*)	0.32	50	
1204064-01				0.37	50	RAD
L204219-DUP1				0.35	50	↓
MS1		0.500	1.0	0.37	50	↓
1204068-01				0.31	50	
L204219-DUP2				0.32	50	
MS2		0.500	1.0	0.31	50	dilution
1204069-01				0.34	50	~~(RAD STAT?)~~ 4/19/12 RAD
L204219-DUP3				0.35	50	
MS3		0.500	1.0	0.35	50	
1204069-02				0.37	50	
1204070-01				0.35	50	
L204219-DUP4				0.34	50	
MS4		0.500	1.0	0.36	50	
1204071-01				0.32	50	
L204219-DUP5				0.35	50	
MS5		0.500	1.0	0.33	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1101430	4/19/12 1240
ICV/CCV/LCS	I.M 1101427	↓

Reviewed By/Date: [illegible] 4/23/12

se book # 9368 for std traceability information

Soil LCS True Value = 1.29 mg/Kg
Standard # 1101357 (*)

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

ME-HgCVAA-Prep0910

Page #:

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PREPARATION BENCH SHEET

L204276

Lionville Laboratory

Printed: 4/24/2012 11:44:43AM

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204070-01	6010B ICP Trace	04/24/2012 09:48	0.75	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
L204276-BLK1	QC	04/24/2012 09:48	0.72	50						
L204276-DUP1	QC	04/24/2012 09:48	0.56	50		1204070-01				
L204276-MS1	QC	04/24/2012 09:48	0.67	50	1200457	1204070-01	500			
L204276-SRM1	QC	04/24/2012 09:48	0.51	50	1101357		510			

JJS 4/24/12
Extracts Relinquished By Date

Preeti 04/24/12
Extracts Received By Date

INORGANICS

LIONVILLE LABORATORY
A division of Fibertline Analytical Corporation

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P0W3	1204070-01	Soil	04/17/2012 13:17	04/19/2012 09:35

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-228 K3873
LVL#: 1204070 **Date Received:** 04-19-12

INORGANIC NARRATIVE

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

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

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

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

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

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits and method criteria.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception of Nitrate Nitrite at 22.6% for which the results are less than the limit of quantitation.

9. Results for soil samples are reported on a dry weight basis.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

4/27/12
Date

njp\i04-070

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 11 pages.

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Notes and Definitions

U	Analyte included in the analysis, but not detected
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
Dry	Sample results reported on a dry weight basis
Wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference
LOD	Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
LOQ	Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1P0W3 (1204070-01) Soil										
%Solids	**95.3**			0.1	% by Weight	1	L204255	04/23/2012	04/23/2012	SM2540G
Bromide	1.0	U	1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Chloride	**1.1**	B	1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Nitrate	**1.6**	B	1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Orthophosphate	2.1	U	2.1	10.4	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Sulfate	**11.9**		1.0	5.2	mg/kg dry	1	L204288	04/24/2012	04/24/2012	EPA 300.0 (1993)
Nitrate/Nitrite as N	**0.50**	B	0.10	0.52	mg/kg dry	1	L204257	04/23/2012	04/23/2012	EPA 353.2
Cyanide	0.50	U	0.50	1.00	mg/kg dry	1	L204284	04/25/2012	04/26/2012	SW846 9014
Sulfide	42.0	U	42.0	105	mg/kg dry	1	L204245	04/23/2012	04/23/2012	SW846 9034
pH	**9.50**		0.10	0.10	pH Units	1	L204235	04/20/2012	04/20/2012	SW846 9045D
%Moisture	**4.67**		0.10	0.10	% by Weight	1	L204256	04/23/2012	04/23/2012	D2216

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204235 - Default Prep GenChem										
Duplicate (L204235-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/20/2012						
pH	9.36	0.10	0.10	pH Units		9.50			1.48	20
Reference (L204235-SRM1)				Prepared & Analyzed: 04/20/2012						
pH	10.05	0.10	0.10	pH Units	10.010		100	99-101		
Batch L204245 - SW 9030B										
Blank (L204245-BLK1)				Prepared & Analyzed: 04/23/2012						
Sulfide	40.0 U	40.0	100	mg/kg wet						
LCS (L204245-BS1)				Prepared & Analyzed: 04/23/2012						
Sulfide	248	40.0	100	mg/kg wet	241.34		103	80-120		20
LCS (L204245-BS2)				Prepared & Analyzed: 04/23/2012						
Sulfide	253	40.0	100	mg/kg wet	242.93		104	80-120		20
Duplicate (L204245-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
Sulfide	42.0 U	42.0	105	mg/kg dry		42.0 U				20
Matrix Spike (L204245-MS1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
Sulfide	250	42.0	105	mg/kg dry	251.79	42.0 U	99.1	75-125		
Batch L204255 - % Solids										
Duplicate (L204255-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
%Solids	93.8		0.1	% by Weight		95.3			2	20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204256 - Default Prep GenChem										
Duplicate (L204256-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
%Moisture	6.20	0.10	0.10	% by Weight		4.67			28.3*	20
Batch L204257 - Default Prep GenChem										
Blank (L204257-BLK1)				Prepared & Analyzed: 04/23/2012						
Nitrate/Nitrite as N	0.10 U	0.10	0.48	mg/kg wet						
LCS (L204257-BS1)				Prepared & Analyzed: 04/23/2012						
Nitrate/Nitrite as N	5.26	0.10	0.50	mg/kg wet	4.9834		106	90-110		20
Duplicate (L204257-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
Nitrate/Nitrite as N	0.40 B	0.10	0.52	mg/kg dry		0.50			22.6*	20
Matrix Spike (L204257-MS1)	**Source: 1204070-01**			Prepared & Analyzed: 04/23/2012						
Nitrate/Nitrite as N	5.74	0.10	0.50	mg/kg dry	5.0253	0.50	104	75-125		
Batch L204284 - SW 9010B										
Blank (L204284-BLK1)				Prepared: 04/25/2012 Analyzed: 04/26/2012						
Cyanide	0.43 U	0.43	0.86	mg/kg wet						
LCS (L204284-BS1)				Prepared: 04/25/2012 Analyzed: 04/26/2012						
Cyanide	1.81	0.48	0.97	mg/kg wet	1.9391		93.3	80-120		
LCS (L204284-BS2)				Prepared: 04/25/2012 Analyzed: 04/26/2012						
Cyanide	8.29	0.46	0.92	mg/kg wet	9.1895		90.3	80-120		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204284 - SW 9010B										
Duplicate (L204284-DUP2)	**Source: 1204070-01**			Prepared: 04/25/2012 Analyzed: 04/26/2012						
Cyanide	0.45 U	0.45	0.89	mg/kg dry		0.50 U				20
Matrix Spike (L204284-MS2)	**Source: 1204070-01**			Prepared: 04/25/2012 Analyzed: 04/26/2012						
Cyanide	4.86	0.51	1.02	mg/kg dry	5.0929	0.50 U	95.4	75-125		
Batch L204288 - Default Prep GenChem										
Blank (L204288-BLK1)				Prepared & Analyzed: 04/24/2012						
Fluoride	1.0 U	1.0	5.0	mg/kg wet						
Chloride	1.0 U	1.0	5.0	mg/kg wet						
Bromide	1.0 U	1.0	5.0	mg/kg wet						
Orthophosphate	2.0 U	2.0	10.0	mg/kg wet						
Sulfate	2.2 B	1.0	5.0	mg/kg wet						
Nitrate	1.0 U	1.0	5.0	mg/kg wet						
Nitrite	1.0 U	1.0	5.0	mg/kg wet						
LCS (L204288-BS1)				Prepared & Analyzed: 04/24/2012						
Fluoride	47.6	1.0	5.0	mg/kg wet	50.000		95.2	80-120		20
Chloride	47.3	1.0	5.0	mg/kg wet	50.000		94.6	80-120		20
Bromide	48.3	1.0	5.0	mg/kg wet	50.000		96.6	80-120		20
Orthophosphate	48.3	2.0	10.0	mg/kg wet	50.000		96.6	80-120		20
Sulfate	50.3	1.0	5.0	mg/kg wet	50.000		101	80-120		20
Nitrate	48.4	1.0	5.0	mg/kg wet	50.000		96.8	80-120		20
Nitrite	48.1	1.0	5.0	mg/kg wet	50.000		96.2	80-120		20
Duplicate (L204288-DUP1)	**Source: 1204070-01**			Prepared & Analyzed: 04/24/2012						
Fluoride	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Chloride	1.1 B	1.0	5.2	mg/kg dry		1.1			0.662	20
Bromide	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20
Orthophosphate	2.1 U	2.1	10.4	mg/kg dry		2.1 U				20
Sulfate	13.9	1.0	5.2	mg/kg dry		11.9			15.2	20
Nitrate	1.5 B	1.0	5.2	mg/kg dry		1.6			6.24	20
Nitrite	1.0 U	1.0	5.2	mg/kg dry		1.0 U				20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3873	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 14:40

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204288 - Default Prep GenChem										
Matrix Spike (L204288-MS1)	**Source: 1204070-01**			Prepared & Analyzed: 04/24/2012						
Fluoride	42.8	1.0	5.0	mg/kg dry	50.253	1.0 U	85.2	75-125		20
Chloride	49.3	1.0	5.0	mg/kg dry	50.253	1.1	95.9	75-125		20
Bromide	49.4	1.0	5.0	mg/kg dry	50.253	1.0 U	98.4	75-125		20
Orthophosphate	51.3	2.0	10.1	mg/kg dry	50.253	2.1 U	102	75-125		20
Sulfate	69.8	1.0	5.0	mg/kg dry	50.253	11.9	115	75-125		20
Nitrate	51.5	1.0	5.0	mg/kg dry	50.253	1.6	99.3	75-125		20
Nitrite	48.9	1.0	5.0	mg/kg dry	50.253	1.0 U	97.4	75-125		20