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

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 5/22/12
INITIAL/DATE

COMMENTS:

SDG K3877 SAF-RC-228

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Sample Location: 340 Complex – Test Pits

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
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Richmond, California 94804-3849
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May 8, 2012

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

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-04-091-7666 SDG K3877

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 24, 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 K3877 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 8, 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

No 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**	5/8/12 **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 K3877

SDG	7666
Contact	Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K3877

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

About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Method Blanks	7
Lab Control Samples	8
Duplicates	9
Data Sheets	10
Method Summaries	11
Report Guides	15
End of Section	29

Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	05/04/12

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.

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 K3877

SDG 7666
Contact Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S204091-01	J1P118	340 Complex - Test Pits	SOIL		RC-228	RC-228-025	04/19/12 13:54
S204091-02	Lab Control Sample		SOIL		RC-228		
S204091-03	Method Blank		SOIL		RC-228		
S204091-04	Duplicate (S204091-01)	340 Complex - Test Pits	SOIL		RC-228		04/19/12 13:54

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

QC SUMMARY

SDG 7666
Contact Joseph Verville

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

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
7666	RC-228-025	J1P118	SOIL	93.5	1725 g		04/24/12	5	S204091-01	7666-001
		Method Blank	SOIL						S204091-03	7666-003
		Lab Control Sample	SOIL						S204091-02	7666-002
		Duplicate (S204091-01)	SOIL	93.5	1725 g		04/24/12	5	S204091-04	7666-004

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

SDG 7666
Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

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	7320-138	8.0	1			1	1	1/1		
Beta Counting												
SR	SOIL	Total Strontium in Solids	7320-138	10.4	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOIL	Gamma Scan	7320-138	7.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOIL	Tritium in Solids	7320-138	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 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

SDG 7666
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S204091-01	J1P118			7666-001	GAM		04/27/12	05/03/12	CSS	Gamma Scan
04/19/12	340 Complex - Test Pits		SOIL	7666-001	H		04/26/12	04/30/12	BW	Tritium in Solids
04/24/12	RC-228-025	RC-228		7666-001	PU		05/01/12	05/01/12	BW	Plutonium, Isotopic in Solids
				7666-001	SR		04/27/12	04/30/12	BW	Total Strontium in Solids
S204091-02	Lab Control Sample			7666-002	GAM		04/27/12	05/03/12	CSS	Gamma Scan
			SOIL	7666-002	H		04/26/12	04/30/12	BW	Tritium in Solids
		RC-228		7666-002	PU		05/01/12	05/01/12	BW	Plutonium, Isotopic in Solids
				7666-002	SR		04/27/12	04/30/12	BW	Total Strontium in Solids
S204091-03	Method Blank			7666-003	GAM		04/27/12	05/03/12	CSS	Gamma Scan
			SOIL	7666-003	H		04/26/12	04/30/12	BW	Tritium in Solids
		RC-228		7666-003	PU		05/01/12	05/01/12	BW	Plutonium, Isotopic in Solids
				7666-003	SR		04/27/12	04/30/12	BW	Total Strontium in Solids
S204091-04	Duplicate (S204091-01)			7666-004	GAM		04/27/12	05/03/12	CSS	Gamma Scan
04/19/12	340 Complex - Test Pits		SOIL	7666-004	H		04/26/12	04/30/12	BW	Tritium in Solids
04/24/12		RC-228		7666-004	PU		05/01/12	05/01/12	BW	Plutonium, Isotopic in Solids
				7666-004	SR		04/27/12	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 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

7666-003 Method Blank

METHOD BLANK

SDG	7666	Client/Case no	Hanford SDG_K3877
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S204091-03	Client sample id	Method Blank
Dept sample id	7666-003	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	1.40	1.7	2.82	10.0	U	H
Total Strontium	SR-RAD	0.014	0.15	0.293	1.00	U	SR
Plutonium 238	13981-16-3	-0.024	0.024	0.115	1.00	U	PU
Plutonium 239/240	PU-239/240	-0.012	0.024	0.092	1.00	U	PU
Potassium 40	13966-00-2	U		0.129		U	GAM
Cobalt 60	10198-40-0	U		0.009	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		0.032		U	GAM
Europium 152	14683-23-9	U		0.023	0.100	U	GAM
Europium 154	15585-10-1	U		0.029	0.100	U	GAM
Europium 155	14391-16-3	U		0.024	0.100	U	GAM
Radium 226	13982-63-3	U		0.019	0.100	U	GAM
Radium 228	15262-20-1	U		0.032	0.200	U	GAM
Thorium 228	14274-82-9	U		0.012		U	GAM
Thorium 232	TH-232	U		0.032		U	GAM
Uranium 235	15117-96-1	U		0.047	0.300	U	GAM
Uranium 238	U-238	U		1.27	10.0	U	GAM
Americium 241	14596-10-2	U		0.023	0.300	U	GAM
Zinc 65	13982-39-3	U		0.015		U	GAM
Ruthenium 106	13967-48-1	U		0.088		U	GAM
Antimony 125	14234-35-6	U		0.019		U	GAM
Bismuth 214	14733-03-0	U		0.019		U	GAM
Lead 212	15092-94-1	U		0.012		U	GAM

QC-BLANK #81636

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

7666-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7666

Contact Joseph Verville

Client/Case no Hanford SDG K3877

Contract No. S00W235A01

Lab sample id S204091-02

Dept sample id 7666-002

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	127	5.2	3.04	10.0		H	127	5.1	100	83-117	80-120
Total Strontium	8.99	0.45	0.201	1.00		SR	9.34	0.37	96	82-118	80-120
Plutonium 238	10.3	0.94	0.103	1.00		PU	11.4	0.46	90	82-118	80-120
Plutonium 239/240	12.8	1.1	0.103	1.00		PU	13.2	0.53	97	82-118	80-120
Cobalt 60	0.329	0.031	0.019	0.050		GAM	0.348	0.014	95	82-118	80-120
Cesium 137	0.374	0.027	0.018	0.100		GAM	0.395	0.016	95	84-116	80-120

QC-LCS #81635

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

7666-004 J1P118

DUPLICATE

SDG	7666			Client/Case no	Hanford SDG K3877
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S204091-04	Lab sample id	S204091-01	Client sample id	J1P118
Dept sample id	7666-004	Dept sample id	7666-001	Location/Matrix	340 Complex - Test Pits SOIL
		Received	04/24/12	Collected/Weight	04/19/12 13:54 1725 g
% solids	93.5	% solids	93.5	Custody/SAF No	RC-228-025 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	0.330	1.9	3.33	10.0	U	H	0.779	2.0	3.37	U	-		0.3
Total Strontium	0.099	0.15	0.276	1.00	U	SR	0.002	0.096	0.187	U	-		1.1
Plutonium 238	0	0.025	0.094	1.00	U	PU	0	0.031	0.118	U	-		0
Plutonium 239/240	0.012	0.025	0.094	1.00	U	PU	0	0.031	0.118	U	-		0.6
Potassium 40	12.1	0.57	0.246			GAM	12.6	0.48	0.172		4	17	0.7
Cobalt 60	U		0.025	0.050	U	GAM	U		0.019	U	-		0.4
Niobium 94	U		0.023		U	GAM	U		0.016	U	-		0.5
Cesium 137	0.150	0.031	0.031	0.100		GAM	0.142	0.023	0.025		5	42	0.4
Cerium 144	U		0.131		U	GAM	U		0.138	U	-		0.1
Europium 152	U		0.057	0.100	U	GAM	U		0.061	U	-		0.1
Europium 154	U		0.088	0.100	U	GAM	U		0.061	U	-		0.5
Europium 155	U		0.067	0.100	U	GAM	U		0.071	U	-		0.1
Radium 226	0.397	0.051	0.047	0.100		GAM	0.374	0.040	0.039		6	29	0.6
Radium 228	0.601	0.12	0.123	0.200		GAM	0.676	0.080	0.073		12	37	1.0
Thorium 228	0.629	0.036	0.033			GAM	0.624	0.031	0.026		1	19	0.1
Thorium 232	0.601	0.12	0.123			GAM	0.676	0.080	0.073		12	37	1.0
Uranium 235	U		0.144	0.300	U	GAM	U		0.147	U	-		0
Uranium 238	U		2.91	10.0	U	GAM	U		2.32	U	-		0.3
Americium 241	U		0.043	0.300	U	GAM	U		0.103	U	-		1.1
Zinc 65	U		0.060		U	GAM	U		0.047	U	-		0.3
Ruthenium 106	U		0.189		U	GAM	U		0.147	U	-		0.3
Antimony 125	U		0.052		U	GAM	U		0.050	U	-		0.1
Bismuth 214	0.409	0.053	0.049			GAM	0.385	0.041	0.040		6	29	0.6
Lead 212	0.649	0.038	0.034			GAM	0.643	0.032	0.027		1	19	0.1

QC-DUP#1 81637

340 Building Geoprobe and Test-Pit Sampling

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

7666-001 J1P118

DATA SHEET

SDG	7666	Client/Case no	Hanford SDG_K3877
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S204091-01	Client sample id	J1P118
Dept sample id	7666-001	Location/Matrix	340 Complex - Test Pits SOIL
Received	04/24/12	Collected/Weight	04/19/12 13:54 1725 g
% solids	93.5	Custody/SAF No	RC-228-025 RC-228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.779	2.0	3.37	10.0	U	H
Total Strontium	SR-RAD	0.002	0.096	0.187	1.00	U	SR
Plutonium 238	13981-16-3	0	0.031	0.118	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.031	0.118	1.00	U	PU
Potassium 40	13966-00-2	12.6	0.48	0.172			GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Niobium 94	14681-63-1	U		0.016		U	GAM
Cesium 137	10045-97-3	0.142	0.023	0.025	0.100		GAM
Cerium 144	14762-78-8	U		0.138		U	GAM
Europium 152	14683-23-9	U		0.061	0.100	U	GAM
Europium 154	15585-10-1	U		0.061	0.100	U	GAM
Europium 155	14391-16-3	U		0.071	0.100	U	GAM
Radium 226	13982-63-3	0.374	0.040	0.039	0.100		GAM
Radium 228	15262-20-1	0.676	0.080	0.073	0.200		GAM
Thorium 228	14274-82-9	0.624	0.031	0.026			GAM
Thorium 232	TH-232	0.676	0.080	0.073			GAM
Uranium 235	15117-96-1	U		0.147	0.300	U	GAM
Uranium 238	U-238	U		2.32	10.0	U	GAM
Americium 241	14596-10-2	U		0.103	0.300	U	GAM
Zinc 65	13982-39-3	U		0.047		U	GAM
Ruthenium 106	13967-48-1	U		0.147		U	GAM
Antimony 125	14234-35-6	U		0.050		U	GAM
Bismuth 214	14733-03-0	0.385	0.041	0.040			GAM
Lead 212	15092-94-1	0.643	0.032	0.027			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	05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

Test PU Matrix SOIL
SDG 7666
Contact Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K3877

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238	Plutonium 239/240
Preparation batch 7320-138						
S204091-01			7666-001	J1P118	U	U
S204091-02			7666-002	Lab Control Sample	ok	ok
S204091-03			7666-003	Method Blank	U	U
S204091-04			7666-004	Duplicate (S204091-01)	- U	- 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 7320-138			2σ prep error 8.0 %	Reference Lab Notebook No. 7301 pg. 61												
S204091-01			J1P118	0.118	0.500			80		222			12	04/30/12	05/01	SS-054
S204091-02			Lab Control Sample	0.103	0.500			75		221				04/30/12	05/01	SS-055
S204091-03			Method Blank	0.115	0.500			91		222				04/30/12	05/01	SS-063
S204091-04			Duplicate (S204091-01)	0.094	0.500			85		222			12	04/30/12	05/01	SS-064
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 FOR 4 SAMPLES
MDA 0.108 ± 0.022
YIELD 83 ± 14

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

Test	SR
Matrix	SOIL
SDG	7666
Contact	Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3877

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7320-138					
S204091-01			7666-001	J1P118	U
S204091-02			7666-002	Lab Control Sample	ok
S204091-03			7666-003	Method Blank	U
S204091-04			7666-004	Duplicate (S204091-01)	- U
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 7320-138			2σ prep error 10.4 % Reference Lab Notebook No. 7301 pg. 61													
S204091-01			J1P118	0.187	1.00			95		120			8	04/27/12	04/27	GRB-223
S204091-02			Lab Control Sample	0.201	1.00			96		120				04/27/12	04/27	GRB-224
S204091-03			Method Blank	0.293	1.00			92		100				04/27/12	04/27	GRB-225
S204091-04			Duplicate (S204091-01)	0.276	1.00			96		100			8	04/27/12	04/27	GRB-227
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	0.239	± 0.106
	YIELD	95	± 4

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

Test	GAM
Matrix	SOIL
SDG	7666
Contact	Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3877

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7320-138						
S204091-01			7666-001	J1P118	U	0.142
S204091-02			7666-002	Lab Control Sample	ok	ok
S204091-03			7666-003	Method Blank	U	U
S204091-04			7666-004	Duplicate (S204091-01)	- 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 7320-138			2σ prep error 7.0 % Reference Lab Notebook No. 7301 pg. 61													
S204091-01			J1P118	0.019	745					112			8	04/26/12	04/27	MB,02,00
S204091-02			Lab Control Sample	0.019	745					112				04/26/12	04/27	01,03,00
S204091-03			Method Blank	0.009	745					112				04/26/12	04/27	01,04,00
S204091-04			Duplicate (S204091-01)	0.025	745					103			8	04/26/12	04/27	02,01,00
Nominal values and limits from method				0.050	745					100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	0.018 ± 0.013
	YIELD	____ ± ____

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/04/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3877

Test H	Matrix SOIL
SDG 7666	
Contact Joseph Verville	

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract No. S00W235A01	
Contract SDG K3877	

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7320-138						
S204091-01			7666-001	J1P118	U	
S204091-02			7666-002	Lab Control Sample	ok	
S204091-03			7666-003	Method Blank	U	
S204091-04			7666-004	Duplicate (S204091-01)	-	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 7320-138			2σ prep error 10.0 %	Reference Lab Notebook No. 7301 pg. 61												
S204091-01			J1P118	3.37	0.622			100		50			7	04/26/12	04/26	LSC-004
S204091-02			Lab Control Sample	3.04	0.620			100		50				04/26/12	04/26	LSC-004
S204091-03			Method Blank	2.82	0.620			100		50				04/26/12	04/26	LSC-004
S204091-04			Duplicate (S204091-01)	3.33	0.621			100		50			7	04/26/12	04/26	LSC-004
Nominal values and limits from method				10.0	0.620					50			180			

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

AVERAGES ± 2 SD	MDA	3.14	±	0.518
FOR 4 SAMPLES	YIELD	100	±	0

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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 05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

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 05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

WORK SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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
Form DVD-RG
Version 3.06
Report date 05/04/12

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 7666
Contact Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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.

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/12

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 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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
Form DVD-RG
Version 3.06
Report date 05/04/12

SDG 7666
Contact Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG_K3877

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 05/04/12

SDG 7666
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3877

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'

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/04/12

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-228-025	Page ~~2 of 2~~ 1 of 1
Collector M. Simonds	**Company Contact** Joan Kessner; **Telephone No.** 509.375.4688	**Project Coordinator** KESSNER, JH	**Price Code** 8L; **Data Turnaround** 21 Days (KDB 4/19/12)
Project Designation 340 Building Geoprobe and Test-Pit Sampling	**Sampling Location** 340 Complex -- Test Pits K3877 (7666)	**SAF No.** RC-228	
Ice Chest No. WCH-11-023	**Field Logbook No.** EL-1663 ~~01~~ 02 KDB 4/19/12; **COA** R340CX2600	**Method of Shipment** FedEx/Hand Deliver	
Shipped To EBERLINE SERVICES ~~LIONVILLE~~ KDB 4/19/12	**Offsite Property No.** ~~NA~~ 4-19-12 cmB A110320	**Bill of Lading/Air Bill No.** ~~NA~~ 4-19-12 cmB See OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potential Radioactive~~ < DOT limits
4-23-12 cmB

Special Handling and/or Storage
Cool 4C

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					RCF
Sample No. / Matrix * / Sample Date / Sample Time											
J1P118 / SOIL / 4/19/12 / 1354		✓	✓	✓	✓						32877

KDB 4/19/12

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS	4-19-12 1520	DAVID BECKER	4/19/12 1520
DAVID BECKER	4/19/12 1615	Bingham	1060HB 4-19-12 1615
Bingham	1060HB 4-23-12 1045	Fed EX	
FEDEX		Alex Kelenson KELENSON	4/24/12 15:00

SPECIAL INSTRUCTIONS
~~Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further~~ direction is provided. KDB 4/19/12

(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 AJ
DATE 4-23-12

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

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

WCH-EE-011

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 4/24/12 15:00 CoC No. RC-228-025

Container I.D. No. WCH-11-023 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: 4/24/12 Time: 15:40

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
JIP118	<80						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

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

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

15 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 #	1204080
SDG #	K3877
SAF #	RC-228
Date Received	04/25/12
# 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 111 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1204080

Custody Transfer Record/Lab Work Request

Revision

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford 3AF# KC-228
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: STD TAT: 21 Days

Date Rec'd: 4-25-12 Date Due: 5-16-12

		A-D	E	F	G	H	I	J	K	L	M	N	O
Refrigerator #		F001	2	2	2	2	2	2	2	2	2	2	2
#/Type Container	Liquid												
	Solid	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG	1AG
Volume	Liquid												
	Solid	40	60	60	60	60	120	120	60	60	120	60	40
Preservatives		—	—	—	—	—	—	—	—	—	—	—	—
ANALYSES REQUESTED		ORGANIC							INORG				
		VOA	BNA	Pest/PCB	NTPH-D Herb	PAHs	TCLP VOA	TCLP BNA	Metal Hg	CN	Sulfide	TCLP met	TCLP Hg	Ic Anions	% Solids

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

Lionville Laboratory Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8260	8270	~~8081~~ 8082	DRO	8310 PAH	TCLV 8260	TCLP 8270	Metal①	CN/TC	SFD	TCLP	RCRA	Anions, pH, N3N2	% Moist
01	J1P118	✓	✓	Soil	4-19-12	1354	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Sent w/ 4-25-12

cancelled 5-15-12

Special Instructions:

Met① = HSL + B, Mo, Si, U, Zr, Li (NO-TL)

Special Instructions:

1. → TCLP METALS Leach - Hold Analysis until further direction
2. 5-15-12 TCLP Metals Leachates cancelled per client.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	4/25/12	0945

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-228-025 | 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-11-059

Field Logbook No.
EL-1663-~~01~~02 4/19/12

COA
R340CX2600

Method of Shipment
FedEx/Hand Deliver

Shipped To
~~EBERLINE SERVICES~~ LIONVILLE 4/19/12

Offsite Property No.
~~NA~~ 4-19-12 cmB A110288

Bill of Lading/Air Bill No.
~~NA~~ 4-19-12 cmB SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potential~~ Radioactive < DOT limits
4-23-12 cmB

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	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 4/19/12	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										
J1P118	SOIL	4/19/12	1354	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

RCF 32877

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONS	4-19-12 1520	DAVID BECKER	4/19/12 1520
DAVID BECKER	4/19/12 1615	[illegible]	4-19-12 1615
[illegible]	4-23-12 1100	Fed EX	
Fed EX	4/25/12 0945	VICTOR HERNANDEZ	4/25/12 0945

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

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

*Freeze upon receipt
4-23-12 cmB

VOA samples frozen upon collection

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 AT
DATE 4-23-12

WCH-EE-011

00000004

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-228-025 | 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-11-059

Field Logbook No.: EL-1663-~~01~~ 02 4/19/12

COA: R340CX2600

Method of Shipment: FedEx/Hand Deliver

Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 4/19/12

Offsite Property No.: ~~NA~~ 4-19-12 cmB A110288

Bill of Lading/Air Bill No.: ~~NA~~ 4-19-12 cmB See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential Radioactive~~ < DOT limits 4-23-12 cmB

Special Handling and/or Storage

Cool 4C

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										
J1P118	SOIL	4/19/12	1354	✓									

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS	4-19-12 1520	DAVID BECKER	4/19/12 1520
DAVID BECKER	4/19/12 1615	[illegible]	4-19-12 1615
[illegible]	WCH 4-23-12 1100	Fed EX	
Fed Ex	4/25/12 0945	VICTOR HERNANDEZ	4/25/12 0945

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}~~ 4/19/12

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

REVIEWED BY AT DATE 4-23-12

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

WCH-EE-011

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
Project/SAF/SOW/Release #: RC-228

Date: 4/25/12

LvL Batch #: 1204080

Sample Custodian: Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered ~~or Shipped?~~	Carrier FED EX		Airbill # 7934 8435 2646
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: Missing handle
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 4.3	°C	Cooler # WCH-11-059
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	VOA Bagged in Two Bags label outside of Bag no ID on individual bottles
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	~~☑ Yes~~ mp 5-10-12	☑ No	NO_2, NO_3, PO_4-O rec'd past hold
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 O. Johnson

Date 4/25/12

000000006

VOLATILES

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.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 15:32

Analytical Report for Volatile Organic Compounds by SW846 8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Date Received: 04-25-2012

GC/MS VOLATILE

One (1) soil sample was collected on 04-19-2012.

The sample and associated QC samples were prepared and analyzed 04-26-2012 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. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.
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."

for Iain Daniels
LvL Laboratory Manager

4/30/12
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.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 15:32

J1P118
1204080-01 (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	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,1,2,2-Tetrachloroethane	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,1,2-Trichloroethane	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,1-Dichloroethane	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,1-Dichloroethene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,2-Dichloroethane	6.51	U	6.51	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,2-Dichloroethene (total)	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
1,2-Dichloropropane	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
2-Butanone	13.0	U	13.0	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
2-Hexanone	13.0	U	13.0	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
4-Methyl-2-pentanone	13.0	U	13.0	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Acetone	13.0	U	13.0	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Benzene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Bromodichloromethane	6.51	U	6.51	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Bromoform	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Bromomethane	10.8	U	10.8	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Carbon Disulfide	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Carbon Tetrachloride	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Chlorobenzene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Chloroethane	10.8	U	10.8	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Chloroform	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Chloromethane	10.8	U	10.8	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
cis-1,2-Dichloroethene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
cis-1,3-Dichloropropene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Dibromochloromethane	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Ethylbenzene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Methylene Chloride	6.51	U	6.51	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Styrene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Tetrachloroethene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
trans-1,2-Dichloroethene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Toluene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
trans-1,3-Dichloropropene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Trichloroethene	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Vinyl chloride	10.8	U	10.8	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Xylenes, total	5.42	U	5.42	ug/kg dry	1	L204300	04/26/2012	04/26/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*90 %*		*60-130*			*L204300*	*04/26/2012*	*04/26/2012*	*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: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 15:32

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*97 %*	*72-117*			*L204300*	*04/26/2012*	*04/26/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*114 %*	*72-144*			*L204300*	*04/26/2012*	*04/26/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/27/2012 15:32

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 L204300 - SW 5035A										
Blank (L204300-BLK1)				Prepared & Analyzed: 04/26/2012						
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	*49.1*			*ug/kg wet*	*50.000*		*98*	*60-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 04/27/2012 15:32

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 L204300 - SW 5035A									
Blank (L204300-BLK1)			Prepared & Analyzed: 04/26/2012						
Surrogate: Toluene-d8	*50.5*		*ug/kg wet*	*50.000*		*101*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*54.6*		*ug/kg wet*	*50.000*		*109*	*72-144*		
LCS (L204300-BS1)			Prepared & Analyzed: 04/26/2012						
1,1,1-Trichloroethane	45.6	5.00	ug/kg wet	50.000		91	65-130		
1,1,2,2-Tetrachloroethane	48.2	5.00	ug/kg wet	50.000		96	50-130		
1,1,2-Trichloroethane	47.0	5.00	ug/kg wet	50.000		94	60-125		
1,1-Dichloroethane	49.1	5.00	ug/kg wet	50.000		98	70-130		
1,1-Dichloroethene	53.0	5.00	ug/kg wet	50.000		106	60-130		
1,2-Dichloroethane	46.1	6.00	ug/kg wet	50.000		92	60-130		
1,2-Dichloroethene (total)	106	5.00	ug/kg wet	100.00		106	75-125		
1,2-Dichloropropane	50.1	5.00	ug/kg wet	50.000		100	70-130		
2-Butanone	52.1	12.0	ug/kg wet	50.000		104	20-200		
2-Hexanone	46.5	12.0	ug/kg wet	50.000		93	20-200		
4-Methyl-2-pentanone	48.5	12.0	ug/kg wet	50.000		97	40-150		
Acetone	37.1	12.0	ug/kg wet	50.000		74	15-240		
Benzene	47.4	5.00	ug/kg wet	50.000		95	75-125		
Bromodichloromethane	46.0	6.00	ug/kg wet	50.000		92	65-135		
Bromoform	45.2	5.00	ug/kg wet	50.000		90	60-130		
Bromomethane	49.9	10.0	ug/kg wet	50.000		100	40-150		
Carbon Disulfide	53.7	5.00	ug/kg wet	50.000		107	55-140		
Carbon Tetrachloride	46.4	5.00	ug/kg wet	50.000		93	60-135		
Chlorobenzene	45.4	5.00	ug/kg wet	50.000		91	70-125		
Chloroethane	52.5	10.0	ug/kg wet	50.000		105	50-150		
Chloroform	48.1	5.00	ug/kg wet	50.000		96	70-130		
Chloromethane	58.4	10.0	ug/kg wet	50.000		117	40-130		
cis-1,2-Dichloroethene	51.6	5.00	ug/kg wet	50.000		103	70-125		
cis-1,3-Dichloropropene	45.4	5.00	ug/kg wet	50.000		91	70-125		
Dibromochloromethane	44.6	5.00	ug/kg wet	50.000		89	65-125		
Ethylbenzene	43.6	5.00	ug/kg wet	50.000		87	70-125		
Methylene Chloride	47.2	6.00	ug/kg wet	50.000		94	45-140		
Styrene	45.1	5.00	ug/kg wet	50.000		90	70-125		
Tetrachloroethene	45.4	5.00	ug/kg wet	50.000		91	60-130		
trans-1,2-Dichloroethene	54.4	5.00	ug/kg wet	50.000		109	65-130		
Toluene	44.4	5.00	ug/kg wet	50.000		89	70-125		
trans-1,3-Dichloropropene	45.0	5.00	ug/kg wet	50.000		90	65-125		
Trichloroethene	50.0	5.00	ug/kg wet	50.000		100	70-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 04/27/2012 15:32

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 L204300 - SW 5035A									
LCS (L204300-BS1)			Prepared & Analyzed: 04/26/2012						
Vinyl chloride	51.4	10.0	ug/kg wet	50.000		103	50-150		
Xylenes, total	134	5.00	ug/kg wet	150.00		89	70-125		
Surrogate: 1,2-Dichloroethane-d4	*49.4*		*ug/kg wet*	*50.000*		*99*	*60-130*		
Surrogate: Toluene-d8	*47.4*		*ug/kg wet*	*50.000*		*95*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*49.3*		*ug/kg wet*	*50.000*		*99*	*72-144*		
Matrix Spike (L204300-MS1)		**Source: 1204080-01**	Prepared & Analyzed: 04/26/2012						
1,1,1-Trichloroethane	54.2	5.46	ug/kg dry	54.558	5.42 U	99	65-130		
1,1,2,2-Tetrachloroethane	52.6	5.46	ug/kg dry	54.558	5.42 U	96	50-130		
1,1,2-Trichloroethane	54.9	5.46	ug/kg dry	54.558	5.42 U	101	60-125		
1,1-Dichloroethane	53.6	5.46	ug/kg dry	54.558	5.42 U	98	70-130		
1,1-Dichloroethene	49.9	5.46	ug/kg dry	54.558	5.42 U	91	60-130		
1,2-Dichloroethane	56.8	6.55	ug/kg dry	54.558	6.51 U	104	60-130		
1,2-Dichloroethene (total)	108	5.46	ug/kg dry	109.12	5.42 U	99	75-125		
1,2-Dichloropropane	57.6	5.46	ug/kg dry	54.558	5.42 U	106	70-130		
2-Butanone	57.8	13.1	ug/kg dry	54.558	13.0 U	106	20-200		
2-Hexanone	55.0	13.1	ug/kg dry	54.558	13.0 U	101	20-200		
4-Methyl-2-pentanone	53.1	13.1	ug/kg dry	54.558	13.0 U	97	40-150		
Acetone	44.8	13.1	ug/kg dry	54.558	13.0 U	82	15-240		
Benzene	54.4	5.46	ug/kg dry	54.558	5.42 U	100	75-125		
Bromodichloromethane	56.3	6.55	ug/kg dry	54.558	6.51 U	103	65-135		
Bromoform	53.6	5.46	ug/kg dry	54.558	5.42 U	98	60-130		
Bromomethane	49.1	10.9	ug/kg dry	54.558	10.8 U	90	40-150		
Carbon Disulfide	53.2	5.46	ug/kg dry	54.558	5.42 U	98	55-140		
Carbon Tetrachloride	55.2	5.46	ug/kg dry	54.558	5.42 U	101	60-135		
Chlorobenzene	51.4	5.46	ug/kg dry	54.558	5.42 U	94	70-125		
Chloroethane	52.4	10.9	ug/kg dry	54.558	10.8 U	96	50-150		
Chloroform	56.3	5.46	ug/kg dry	54.558	5.42 U	103	70-130		
Chloromethane	49.1	10.9	ug/kg dry	54.558	10.8 U	90	40-130		
cis-1,2-Dichloroethene	54.6	5.46	ug/kg dry	54.558	5.42 U	100	70-125		
cis-1,3-Dichloropropene	52.9	5.46	ug/kg dry	54.558	5.42 U	97	70-125		
Dibromochloromethane	54.1	5.46	ug/kg dry	54.558	5.42 U	99	65-125		
Ethylbenzene	51.0	5.46	ug/kg dry	54.558	5.42 U	93	70-125		
Methylene Chloride	46.4	6.55	ug/kg dry	54.558	6.51 U	85	45-140		
Styrene	51.3	5.46	ug/kg dry	54.558	5.42 U	94	70-125		
Tetrachloroethene	50.5	5.46	ug/kg dry	54.558	5.42 U	93	60-130		
trans-1,2-Dichloroethene	53.2	5.46	ug/kg dry	54.558	5.42 U	97	65-130		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 04/27/2012 15:32

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 L204300 - SW 5035A									
Matrix Spike (L204300-MS1)		**Source: 1204080-01**	Prepared & Analyzed: 04/26/2012						
Toluene	51.7	5.46	ug/kg dry	54.558	5.42 U	95	70-125		
trans-1,3-Dichloropropene	53.3	5.46	ug/kg dry	54.558	5.42 U	98	65-125		
Trichloroethene	59.4	5.46	ug/kg dry	54.558	5.42 U	109	70-130		
Vinyl chloride	45.8	10.9	ug/kg dry	54.558	10.8 U	84	50-150		
Xylenes, total	153	5.46	ug/kg dry	163.67	5.42 U	93	70-125		
Surrogate: 1,2-Dichloroethane-d4	*57.7*		*ug/kg dry*	*54.558*		*106*	*60-130*		
Surrogate: Toluene-d8	*53.0*		*ug/kg dry*	*54.558*		*97*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*58.0*		*ug/kg dry*	*54.558*		*106*	*72-144*		
Matrix Spike Dup (L204300-MSD1)		**Source: 1204080-01**	Prepared & Analyzed: 04/26/2012						
1,1,1-Trichloroethane	58.5	5.95	ug/kg dry	59.474	5.42 U	98	65-130	1	20
1,1,2,2-Tetrachloroethane	56.0	5.95	ug/kg dry	59.474	5.42 U	94	50-130	2	20
1,1,2-Trichloroethane	58.8	5.95	ug/kg dry	59.474	5.42 U	99	60-125	2	20
1,1-Dichloroethane	57.4	5.95	ug/kg dry	59.474	5.42 U	96	70-130	2	20
1,1-Dichloroethene	57.7	5.95	ug/kg dry	59.474	5.42 U	97	60-130	6	20
1,2-Dichloroethane	61.8	7.14	ug/kg dry	59.474	6.51 U	104	60-130	0.2	20
1,2-Dichloroethene (total)	116	5.95	ug/kg dry	118.95	5.42 U	98	75-125	1	20
1,2-Dichloropropane	56.5	5.95	ug/kg dry	59.474	5.42 U	95	70-130	11	20
2-Butanone	55.4	14.3	ug/kg dry	59.474	13.0 U	93	20-200	13	20
2-Hexanone	56.8	14.3	ug/kg dry	59.474	13.0 U	96	20-200	5	20
4-Methyl-2-pentanone	58.8	14.3	ug/kg dry	59.474	13.0 U	99	40-150	1	20
Acetone	41.8	14.3	ug/kg dry	59.474	13.0 U	70	15-240	15	20
Benzene	58.0	5.95	ug/kg dry	59.474	5.42 U	98	75-125	2	20
Bromodichloromethane	60.4	7.14	ug/kg dry	59.474	6.51 U	102	65-135	2	20
Bromoform	56.7	5.95	ug/kg dry	59.474	5.42 U	95	60-130	3	20
Bromomethane	58.5	11.9	ug/kg dry	59.474	10.8 U	98	40-150	9	20
Carbon Disulfide	58.9	5.95	ug/kg dry	59.474	5.42 U	99	55-140	2	20
Carbon Tetrachloride	59.4	5.95	ug/kg dry	59.474	5.42 U	100	60-135	1	20
Chlorobenzene	54.1	5.95	ug/kg dry	59.474	5.42 U	91	70-125	3	20
Chloroethane	62.6	11.9	ug/kg dry	59.474	10.8 U	105	50-150	9	20
Chloroform	61.2	5.95	ug/kg dry	59.474	5.42 U	103	70-130	0.3	20
Chloromethane	57.3	11.9	ug/kg dry	59.474	10.8 U	96	40-130	7	20
cis-1,2-Dichloroethene	58.8	5.95	ug/kg dry	59.474	5.42 U	99	70-125	1	20
cis-1,3-Dichloropropene	56.4	5.95	ug/kg dry	59.474	5.42 U	95	70-125	2	20
Dibromochloromethane	58.1	5.95	ug/kg dry	59.474	5.42 U	98	65-125	1	20
Ethylbenzene	54.9	5.95	ug/kg dry	59.474	5.42 U	92	70-125	1	20
Methylene Chloride	51.6	7.14	ug/kg dry	59.474	6.51 U	87	45-140	2	20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 04/27/2012 15:32

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 L204300 - SW 5035A									
Matrix Spike Dup (L204300-MSD1)	**Source: 1204080-01**		Prepared & Analyzed: 04/26/2012						
Styrene	55.4	5.95	ug/kg dry	59.474	5.42 U	93	70-125	1	20
Tetrachloroethene	52.2	5.95	ug/kg dry	59.474	5.42 U	88	60-130	5	20
trans-1,2-Dichloroethene	57.6	5.95	ug/kg dry	59.474	5.42 U	97	65-130	0.6	20
Toluene	55.1	5.95	ug/kg dry	59.474	5.42 U	93	70-125	2	20
trans-1,3-Dichloropropene	57.6	5.95	ug/kg dry	59.474	5.42 U	97	65-125	0.8	20
Trichloroethene	65.1	5.95	ug/kg dry	59.474	5.42 U	109	70-130	0.4	20
Vinyl chloride	52.4	11.9	ug/kg dry	59.474	10.8 U	88	50-150	5	20
Xylenes, total	162	5.95	ug/kg dry	178.42	5.42 U	91	70-125	3	20
Surrogate: 1,2-Dichloroethane-d4	*63.0*		*ug/kg dry*	*59.474*		*106*	*60-130*		
Surrogate: Toluene-d8	*55.6*		*ug/kg dry*	*59.474*		*94*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*61.7*		*ug/kg dry*	*59.474*		*104*	*72-144*		

PREPARATION BENCH SHEET

L204300

Lionville Laboratory

Printed: 4/27/2012 3:26:03PM

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
1204080-01	8260B (5035A) TCL VOC	04/26/2012 12:01	4.99	5				5	WC-Hanford, Inc.	
L204300-BLK1	QC	04/26/2012 11:13	5	5				5		
L204300-BS1	QC	04/26/2012 10:39	5	5	1200518		5	5		
L204300-MS1	QC	04/26/2012 12:36	4.96	5	1200518	1204080-01	5	5		
L204300-MSD1	QC	04/26/2012 13:11	4.55	5	1200518	1204080-01	5	5		

Extracts Relinquished By Date

Extracts Received By Date

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/09/2012 13:29

Analytical Report for TCLP Volatiles by SW846 1311/8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Date Received: 04-25-2012

GC/MS VOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 04-19-2012.

The sample and associated QC samples were leached 05-03-2012 and analyzed 05-04-2012 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. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.

2. The sample was analyzed within recommended holding time.

3. Non-target compounds were not detected in this sample.

4. 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.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All blank spike recoveries were within acceptance criteria.

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

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."

Judy Stone

Iain Daniels
Laboratory Manager
Lionville Laboratory

5/11/12
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.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 13:29

J1P118
1204080-01 (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	L205033	05/04/2012	05/04/2012	8260B
1,1-Dichloroethene	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
2-Butanone	0.05	U	0.05	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Chloroform	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Carbon Tetrachloride	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Benzene	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
1,2-Dichloroethane	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Trichloroethene	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Tetrachloroethene	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Chlorobenzene	0.02	U	0.02	mg/L	5	L205033	05/04/2012	05/04/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*107 %*		*60-140*			*L205033*	*05/04/2012*	*05/04/2012*	*8260B*
Surrogate: Toluene-d8	*99 %*		*65-120*			*L205033*	*05/04/2012*	*05/04/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*103 %*		*75-130*			*L205033*	*05/04/2012*	*05/04/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 13:29

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 L205033 - SW 5030B										
Blank (L205033-BLK1)				Prepared & Analyzed: 05/04/2012						
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	*0.0504*			*mg/L*	*0.050000*		*101*	*60-140*		
Surrogate: Toluene-d8	*0.0489*			*mg/L*	*0.050000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0485*			*mg/L*	*0.050000*		*97*	*75-130*		
Blank (L205033-BLK2)				Prepared & Analyzed: 05/04/2012						
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	*0.259*			*mg/L*	*0.25000*		*104*	*60-140*		
Surrogate: Toluene-d8	*0.246*			*mg/L*	*0.25000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.250*			*mg/L*	*0.25000*		*100*	*75-130*		

LIONVILLE LABORATORY
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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 13:29

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 L205033 - SW 5030B										
LCS (L205033-BS1)				Prepared & Analyzed: 05/04/2012						
Vinyl chloride	0.05		0.01	mg/L	0.050000		94	55-135		20
1,1-Dichloroethene	0.05		0.005	mg/L	0.050000		95	65-140		20
2-Butanone	0.05		0.01	mg/L	0.050000		100	20-200		20
Chloroform	0.05		0.005	mg/L	0.050000		92	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		93	75-125		20
1,2-Dichloroethane	0.05		0.005	mg/L	0.050000		92	60-140		20
Trichloroethene	0.05		0.005	mg/L	0.050000		93	75-125		20
Tetrachloroethene	0.05		0.005	mg/L	0.050000		90	70-130		20
Chlorobenzene	0.04		0.005	mg/L	0.050000		90	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.0488*			*mg/L*	*0.050000*		*98*	*60-140*		
Surrogate: Toluene-d8	*0.0500*			*mg/L*	*0.050000*		*100*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0510*			*mg/L*	*0.050000*		*102*	*75-130*		
Matrix Spike (L205033-MS1)		**Source: 1204080-01**		Prepared & Analyzed: 05/04/2012						
Vinyl chloride	0.23	D	0.05	mg/L	0.25000	0.05 U	92	55-135		20
1,1-Dichloroethene	0.24	D	0.02	mg/L	0.25000	0.02 U	94	65-140		20
2-Butanone	0.30	D	0.05	mg/L	0.25000	0.05 U	120	20-200		20
Chloroform	0.24	D	0.02	mg/L	0.25000	0.02 U	96	75-125		20
Carbon Tetrachloride	0.24	D	0.02	mg/L	0.25000	0.02 U	96	65-130		20
Benzene	0.24	D	0.02	mg/L	0.25000	0.02 U	94	75-125		20
1,2-Dichloroethane	0.25	D	0.02	mg/L	0.25000	0.02 U	99	60-140		20
Trichloroethene	0.23	D	0.02	mg/L	0.25000	0.02 U	93	75-125		20
Tetrachloroethene	0.22	D	0.02	mg/L	0.25000	0.02 U	89	70-130		20
Chlorobenzene	0.22	D	0.02	mg/L	0.25000	0.02 U	90	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.263*			*mg/L*	*0.25000*		*105*	*60-140*		
Surrogate: Toluene-d8	*0.245*			*mg/L*	*0.25000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.243*			*mg/L*	*0.25000*		*97*	*75-130*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 13:29

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 L205033 - SW 5030B										
Matrix Spike Dup (L205033-MSD1)		**Source: 1204080-01**		Prepared & Analyzed: 05/04/2012						
Vinyl chloride	0.23	D	0.05	mg/L	0.25000	0.05 U	93	55-135	0.4	20
1,1-Dichloroethene	0.24	D	0.02	mg/L	0.25000	0.02 U	97	65-140	3	20
2-Butanone	0.28	D	0.05	mg/L	0.25000	0.05 U	112	20-200	7	20
Chloroform	0.24	D	0.02	mg/L	0.25000	0.02 U	96	75-125	0.4	20
Carbon Tetrachloride	0.25	D	0.02	mg/L	0.25000	0.02 U	99	65-130	4	20
Benzene	0.24	D	0.02	mg/L	0.25000	0.02 U	95	75-125	0.6	20
1,2-Dichloroethane	0.25	D	0.02	mg/L	0.25000	0.02 U	99	60-140	0.2	20
Trichloroethene	0.24	D	0.02	mg/L	0.25000	0.02 U	95	75-125	1	20
Tetrachloroethene	0.23	D	0.02	mg/L	0.25000	0.02 U	91	70-130	2	20
Chlorobenzene	0.23	D	0.02	mg/L	0.25000	0.02 U	92	75-125	2	20
Surrogate: 1,2-Dichloroethane-d4	*0.266*			*mg/L*	*0.25000*		*106*	*60-140*		
Surrogate: Toluene-d8	*0.245*			*mg/L*	*0.25000*		*98*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.250*			*mg/L*	*0.25000*		*100*	*75-130*		

PREPARATION BENCH SHEET

L205033

Lionville Laboratory

Printed: 5/7/2012 11:09:32AM

00000032

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
1204080-01	1311/8260B TCLV ZHE VOA	05/04/2012 14:34	5	5				25	WC-Hanford, Inc.	diluted 1:5
1205006-01	1311/8260B TCLV ZHE VOA	05/04/2012 16:14	5	5				25	WC-Hanford, Inc.	diluted 1:5
L205033-BLK1	QC	05/04/2012 14:01	5	5				5		
L205033-BLK2	QC	05/04/2012 17:54	5	5				25		diluted 1:5
L205033-BS1	QC	05/04/2012 12:21	5	5	1200518		5	5		
L205033-MS1	QC	05/04/2012 15:07	5	5	1200518	1204080-01	25	25		diluted 1:5
L205033-MS2	QC	05/04/2012 16:47	5	5	1200518	1205006-01	25	25		diluted 1:5
L205033-MSD1	QC	05/04/2012 15:40	5	5	1200518	1204080-01	25	25		diluted 1:5
L205033-MSD2	QC	05/04/2012 17:20	5	5	1200518	1205006-01	25	25		diluted 1:5

RC 5/9/12

Extracts Relinquished By Date

NA RC 5/9/12

Extracts Received By Date

Lionville Laboratory Incorporated

TCLP EXTRACTION RECORD (VOLATILES)

Logbook # 779

Start Date: 5-03-12 Start Time: 13:48 Analyst: RH SOP: SPI-1311.2 Rev. 01C pH of Extraction Fluid:	End Date: 5-04-12 End Time: 07:00 Analyst: RH	Tumbler Speed: 30 RPM Leachate Batch #: L205017 Leachate Page: 1 of 1 Room Temp.(°C) 21 / 21 (start/finish)

COC # 1204080-01 Client ID# J1P118 ZHE #: 22 Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) (Y) N
COC # 1205006-01 Client ID# J1P194 ZHE #: 16 Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) (Y) N
COC # L205017 Client ID# N/A ZHE #: N/A Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: Solids: ____% / NA FLUID #1 1200533 RH 5-04-12 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: 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 RH
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

Comments:

Reviewed By/Date: RW 5/11/12

SEMIVOLATILES

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 12:54

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Date Received: 04-25-2012

SEMIVOLATILE

One (1) soil sample was collected on 04-19-2012.

The sample and associated QC samples were extracted 04-30-2012 and analyzed 05-03-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for client specified target compounds.

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

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

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

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

4. Due to the sample matrix, the sample had an elevated final volume of 4.0 mls. Reporting limits have been adjusted to reflect this change.

5. Three (3) samples required dilution due to the matrix. The samples J1P118, L204317-MS1 and L204317-MSD1 required a 3-fold dilution. Reporting limits have been adjusted to reflect the necessary dilutions.

6. Two (2) of thirty (30) surrogate recoveries were outside acceptance criteria. The surrogate recovery criteria were not met for samples J1P118 and L204317-MS1; however, the MSD1 was within criteria. A copy of the Sample Discrepancy Report (SDR#12MS096) has been enclosed.

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

8. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS096) has been enclosed.

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

9. Two (2) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS096) has been enclosed.

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

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

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

13. Internal standard area and retention time criteria were met for all except sample L204317-BS1. An associated blank analysis fulfilled its reanalysis requirement.

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

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

Iain Daniels
LvL Laboratory Manager

5/10/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS046

Initiator: Shawn Taylor
Date: 5-8-12
Client: WCHanford RC-228K3877

Batch: 1204080
Samples: L204317-BS1, L204317-ms1, msd1
Method: SW846/MCAWW/CLP/

Parameter: 8270C
Matrix: SOIL
Prep Batch: L204317

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)

RGS 5/9/12

(1) <10% recovery of 2,4,6-tribromophenol in JIP118, 2,4,6-tribromophenol below criteria in MS (MSD ok)
(2) low recovery of 2,4-dinitrophenol in L204317-BS1 but L204317-ms1 + L204317-msd1 are ok
(3) no recovery of pentachlorophenol in L204317-ms1 + L204317-msd1 but L204317-BS1 is ok

2. Known or Probable Causes(s) (1)-(3) possible matrix effect samples had an elevated final volume of 4 mls, in addition required a 3 fold dilution for analysis. (4) Acidic phenols subject to erratic chromatographic behavior

RGS 5/9/12

3. Discussion and Proposed Action Other Description: narrate

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

4. Project Manager Instructions...signature/date: 5/10/12

✓ 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: 5-9-12 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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
1,2,4-Trichlorobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
1,2-Dichlorobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
1,3-Dichlorobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
1,4-Dichlorobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4,5-Trichlorophenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4,6-Trichlorophenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4-Dichlorophenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4-Dimethylphenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4-Dinitrophenol	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,4-Dinitrotoluene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2,6-Dinitrotoluene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Chloronaphthalene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Chlorophenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Methylnaphthalene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Methylphenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Nitroaniline	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
2-Nitrophenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
3,3'-Dichlorobenzidine	8900	U	8900	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
3-Nitroaniline	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4,6-Dinitro-2-methylphenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Bromophenyl Phenyl Ether	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Chloro-3-methylphenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Chloroaniline	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Chlorophenyl Phenyl Ether	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
3- and/or 4-Methylphenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Nitroaniline	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
4-Nitrophenol	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Acenaphthene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Acenaphthylene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Anthracene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Benz[a]anthracene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Benzo[a] pyrene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Benzo[b] fluoranthene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Benzo[g,h,i] perylene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Benzo[k] fluoranthene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Bis(2-chloroethoxy) methane	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Semivolatile Organic Compounds by SW846 8270C									
Bis(2-chloroethyl) ether	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Bis(2-chloroisopropyl) ether	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Bis(2-ethylhexyl) phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Butyl Benzyl Phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Carbazole	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Chrysene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Dibenz[a,h]anthracene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Dibenzofuran	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Diethyl Phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Dimethyl Phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Di-n-butyl Phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Di-n-octyl Phthalate	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Fluoranthene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Fluorene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Hexachlorobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Hexachlorobutadiene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Hexachlorocyclopentadiene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Hexachloroethane	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Indeno[1,2,3-cd]pyrene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Isophorone	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Naphthalene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Nitrobenzene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
N-Nitrosodi-n-propylamine	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
N-Nitrosodiphenylamine	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Pentachlorophenol	22200	U	22200	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Phenanthrene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Phenol	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Pyrene	4450	U	4450	ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
TIC:Aldol Condensate 1	**1030**	A, D, J		ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
TIC:Aldol Condensate 2	**35200**	A, B, D, J		ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
TIC:Unknown 1	**1140**	D, J		ug/kg dry	3	L204317	04/30/2012	05/03/2012	8270C
Surrogate: 2-Fluorophenol	*80 %*		*25-121*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*
Surrogate: Phenol-d5	*63 %*		*24-113*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*77 %*		*23-120*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*75 %*		*30-115*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*3 % **		*19-122*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 12:54

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: p-Terphenyl-d14	*86 %*	*18-137*			*L204317*	*04/30/2012*	*05/03/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

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 L204317 - SW 3540C										
Blank (L204317-BLK1)				Prepared: 04/30/2012 Analyzed: 05/03/2012						
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. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

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 L204317 - SW 3540C										
Blank (L204317-BLK1)				Prepared: 04/30/2012 Analyzed: 05/03/2012						
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 TICS	406	J		ug/kg wet						
Trichloro-1-propene	400	J		ug/kg wet						
Aldol Condensate 2 BWS 5/1/12	36400	A, J		ug/kg wet						
Aldol Condensate 3	923	A, J		ug/kg wet						
Aldol Condensate 1	820	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1950*			*ug/kg wet*	*2500.0*		*78*	*25-121*		
Surrogate: Phenol-d5	*2080*			*ug/kg wet*	*2500.0*		*83*	*24-113*		
Surrogate: Nitrobenzene-d5	*1330*			*ug/kg wet*	*1666.7*		*80*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	Reported: 05/08/2012 12:54

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 L204317 - SW 3540C									
Blank (L204317-BLK1)			Prepared: 04/30/2012 Analyzed: 05/03/2012						
Surrogate: 2-Fluorobiphenyl	*1240*		*ug/kg wet*	*1666.7*		*74*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1070*		*ug/kg wet*	*2500.0*		*43*	*19-122*		
Surrogate: p-Terphenyl-d14	*1510*		*ug/kg wet*	*1666.7*		*90*	*18-137*		
LCS (L204317-BS1)			Prepared: 04/30/2012 Analyzed: 05/03/2012						
1,2,4-Trichlorobenzene	1100		ug/kg wet	2000.0		55	45-110		
1,2-Dichlorobenzene	1220		ug/kg wet	2000.0		61	45-105		
1,3-Dichlorobenzene	1170		ug/kg wet	2000.0		58	40-100		
1,4-Dichlorobenzene	1180		ug/kg wet	2000.0		59	35-105		
2,4,5-Trichlorophenol	1430		ug/kg wet	2000.0		72	30-140		
2,4,6-Trichlorophenol	976		ug/kg wet	2000.0		49	20-110		
2,4-Dichlorophenol	1330		ug/kg wet	2000.0		66	40-110		
2,4-Dimethylphenol	1320		ug/kg wet	2000.0		66	30-105		
2,4-Dinitrophenol	341		ug/kg wet	2000.0		17*	25-130		
2,4-Dinitrotoluene	1570		ug/kg wet	2000.0		78	50-115		
2,6-Dinitrotoluene	1460		ug/kg wet	2000.0		73	40-120		
2-Chloronaphthalene	1230		ug/kg wet	2000.0		61	45-115		
2-Chlorophenol	1260		ug/kg wet	2000.0		63	45-105		
2-Methylnaphthalene	1250		ug/kg wet	2000.0		62	45-110		
2-Methylphenol	1460		ug/kg wet	2000.0		73	40-120		
2-Nitroaniline	1650		ug/kg wet	2000.0		82	45-120		
2-Nitrophenol	1180		ug/kg wet	2000.0		59	40-110		
3,3'-Dichlorobenzidine	1590		ug/kg wet	2000.0		80	15-130		
3-Nitroaniline	1770		ug/kg wet	2000.0		89	40-130		
4,6-Dinitro-2-methylphenol	640		ug/kg wet	2000.0		32	20-140		
4-Bromophenyl Phenyl Ether	1230		ug/kg wet	2000.0		61	45-115		
4-Chloro-3-methylphenol	1570		ug/kg wet	2000.0		79	35-115		
4-Chloroaniline	1310		ug/kg wet	2000.0		66	10-100		
4-Chlorophenyl Phenyl Ether	1350		ug/kg wet	2000.0		68	45-110		
3- and/or 4-Methylphenol	1460		ug/kg wet	2000.0		73	40-120		
4-Nitroaniline	1710		ug/kg wet	2000.0		86	40-130		
4-Nitrophenol	1810		ug/kg wet	2000.0		91	15-140		
Acenaphthene	1260		ug/kg wet	2000.0		63	45-110		
Acenaphthylene	1120		ug/kg wet	2000.0		56	45-115		
Anthracene	1380		ug/kg wet	2000.0		69	45-130		
Benz[a]anthracene	1440		ug/kg wet	2000.0		72	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: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

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 L204317 - SW 3540C									
LCS (L204317-BS1)			Prepared: 04/30/2012 Analyzed: 05/03/2012						
Benzo[b] fluoranthene	1220		ug/kg wet	2000.0		61	40-130		
Benzo[g,h,i] perylene	1790		ug/kg wet	2000.0		90	45-125		
Benzo[k] fluoranthene	1210		ug/kg wet	2000.0		60	45-125		
Bis(2-chloroethoxy) methane	1360		ug/kg wet	2000.0		68	45-110		
Bis(2-chloroethyl) ether	1250		ug/kg wet	2000.0		63	40-110		
Bis(2-chloroisopropyl) ether	1450		ug/kg wet	2000.0		72	30-115		
Bis(2-ethylhexyl) phthalate	1560		ug/kg wet	2000.0		78	40-145		
Butyl Benzyl Phthalate	1420		ug/kg wet	2000.0		71	50-125		
Carbazole	1630		ug/kg wet	2000.0		82	40-140		
Chrysene	1490		ug/kg wet	2000.0		74	45-130		
Dibenz[a,h]anthracene	1760		ug/kg wet	2000.0		88	45-125		
Dibenzofuran	1390		ug/kg wet	2000.0		69	45-120		
Diethyl Phthalate	1410		ug/kg wet	2000.0		70	50-125		
Dimethyl Phthalate	1330		ug/kg wet	2000.0		66	45-130		
Di-n-butyl Phthalate	1390		ug/kg wet	2000.0		70	50-130		
Di-n-octyl Phthalate	1330		ug/kg wet	2000.0		67	40-150		
Fluoranthene	1430		ug/kg wet	2000.0		71	45-130		
Fluorene	1410		ug/kg wet	2000.0		70	45-120		
Hexachlorobenzene	1260		ug/kg wet	2000.0		63	45-130		
Hexachlorobutadiene	1160		ug/kg wet	2000.0		58	45-105		
Hexachlorocyclopentadiene	917		ug/kg wet	2000.0		46	10-100		
Hexachloroethane	1160		ug/kg wet	2000.0		58	35-110		
Indeno[1,2,3-cd]pyrene	1750		ug/kg wet	2000.0		87	45-130		
Isophorone	1270		ug/kg wet	2000.0		64	40-110		
Naphthalene	1310		ug/kg wet	2000.0		66	40-110		
Nitrobenzene	1260		ug/kg wet	2000.0		63	40-105		
N-Nitrosodi-n-propylamine	1370		ug/kg wet	2000.0		69	30-130		
N-Nitrosodiphenylamine	1380		ug/kg wet	2000.0		69	50-120		
Pentachlorophenol	700		ug/kg wet	2000.0		35	25-120		
Phenanthrene	1390		ug/kg wet	2000.0		69	50-120		
Phenol	1430		ug/kg wet	2000.0		72	40-115		
Pyrene	1200		ug/kg wet	2000.0		60	45-125		
Surrogate: 2-Fluorophenol	*1680*		*ug/kg wet*	*2500.0*		*67*	*25-121*		
Surrogate: Phenol-d5	*1800*		*ug/kg wet*	*2500.0*		*72*	*24-113*		
Surrogate: Nitrobenzene-d5	*1100*		*ug/kg wet*	*1666.7*		*66*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1060*		*ug/kg wet*	*1666.7*		*64*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*916*		*ug/kg wet*	*2500.0*		*37*	*19-122*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 12:54

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 L204317 - SW 3540C										
LCS (L204317-BS1)				Prepared: 04/30/2012 Analyzed: 05/03/2012						
Surrogate: p-Terphenyl-d14	*1070*			*ug/kg wet*	*1666.7*		*64*	*18-137*		
Matrix Spike (L204317-MS1)		**Source: 1204080-01**		Prepared: 04/30/2012 Analyzed: 05/03/2012						
1,2,4-Trichlorobenzene	1510	D		ug/kg dry	2186.7	4450 U	69	45-110		
1,2-Dichlorobenzene	1640	D		ug/kg dry	2186.7	4450 U	75	45-105		
1,3-Dichlorobenzene	1490	D		ug/kg dry	2186.7	4450 U	68	40-100		
1,4-Dichlorobenzene	1530	D		ug/kg dry	2186.7	4450 U	70	35-105		
2,4,5-Trichlorophenol	692	D		ug/kg dry	2186.7	4450 U	32	30-140		
2,4,6-Trichlorophenol	602	D		ug/kg dry	2186.7	4450 U	28	20-110		
2,4-Dichlorophenol	1400	D		ug/kg dry	2186.7	4450 U	64	40-110		
2,4-Dimethylphenol	1640	D		ug/kg dry	2186.7	4450 U	75	30-105		
2,4-Dinitrophenol	800	D		ug/kg dry	2186.7	22200 U	37	25-130		
2,4-Dinitrotoluene	1700	D		ug/kg dry	2186.7	4450 U	78	50-115		
2,6-Dinitrotoluene	1770	D		ug/kg dry	2186.7	4450 U	81	40-120		
2-Chloronaphthalene	1790	D		ug/kg dry	2186.7	4450 U	82	45-115		
2-Chlorophenol	1770	D		ug/kg dry	2186.7	4450 U	81	45-105		
2-Methylnaphthalene	1850	D		ug/kg dry	2186.7	4450 U	85	45-110		
2-Methylphenol	1920	D		ug/kg dry	2186.7	4450 U	88	40-120		
2-Nitroaniline	1760	D		ug/kg dry	2186.7	22200 U	81	45-120		
2-Nitrophenol	1510	D		ug/kg dry	2186.7	4450 U	69	40-110		
3,3'-Dichlorobenzidine	985	D		ug/kg dry	2186.7	8900 U	45	15-130		
3-Nitroaniline	1720	D		ug/kg dry	2186.7	22200 U	79	40-130		
4,6-Dinitro-2-methylphenol	1360	D		ug/kg dry	2186.7	4450 U	62	20-140		
4-Bromophenyl Phenyl Ether	1630	D		ug/kg dry	2186.7	4450 U	74	45-115		
4-Chloro-3-methylphenol	1690	D		ug/kg dry	2186.7	4450 U	77	35-115		
4-Chloroaniline	1610	D		ug/kg dry	2186.7	4450 U	73	10-100		
4-Chlorophenyl Phenyl Ether	1770	D		ug/kg dry	2186.7	4450 U	81	45-110		
3- and/or 4-Methylphenol	1680	D		ug/kg dry	2186.7	4450 U	77	40-120		
4-Nitroaniline	1450	D		ug/kg dry	2186.7	22200 U	66	40-130		
4-Nitrophenol	984	D		ug/kg dry	2186.7	22200 U	45	15-140		
Acenaphthene	1890	D		ug/kg dry	2186.7	4450 U	87	45-110		
Acenaphthylene	1650	D		ug/kg dry	2186.7	4450 U	75	45-115		
Anthracene	1940	D		ug/kg dry	2186.7	4450 U	89	45-130		
Benz[a]anthracene	1810	D		ug/kg dry	2186.7	4450 U	83	45-130		
Benzo[a] pyrene	1370	D		ug/kg dry	2186.7	4450 U	63	45-130		
Benzo[b] fluoranthene	1530	D		ug/kg dry	2186.7	4450 U	70	40-130		
Benzo[g,h,i] perylene	1590	D		ug/kg dry	2186.7	4450 U	73	45-125		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

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 L204317 - SW 3540C										
Matrix Spike (L204317-MS1)		**Source: 1204080-01**		Prepared: 04/30/2012 Analyzed: 05/03/2012						
Benzo[k] fluoranthene	1510	D		ug/kg dry	2186.7	4450 U	69	45-125		
Bis(2-chloroethoxy) methane	1970	D		ug/kg dry	2186.7	4450 U	90	45-110		
Bis(2-chloroethyl) ether	1690	D		ug/kg dry	2186.7	4450 U	77	40-110		
Bis(2-chloroisopropyl) ether	2000	D		ug/kg dry	2186.7	4450 U	91	30-115		
Bis(2-ethylhexyl) phthalate	1930	D		ug/kg dry	2186.7	4450 U	88	40-145		
Butyl Benzyl Phthalate	2150	D		ug/kg dry	2186.7	4450 U	98	50-125		
Carbazole	2210	D		ug/kg dry	2186.7	4450 U	101	40-140		
Chrysene	1920	D		ug/kg dry	2186.7	4450 U	88	45-130		
Dibenz[a,h]anthracene	1460	D		ug/kg dry	2186.7	4450 U	67	45-125		
Dibenzofuran	2010	D		ug/kg dry	2186.7	4450 U	92	45-120		
Diethyl Phthalate	1950	D		ug/kg dry	2186.7	4450 U	89	50-125		
Dimethyl Phthalate	1850	D		ug/kg dry	2186.7	4450 U	84	45-130		
Di-n-butyl Phthalate	2000	D		ug/kg dry	2186.7	4450 U	91	50-130		
Di-n-octyl Phthalate	1640	D		ug/kg dry	2186.7	4450 U	75	40-150		
Fluoranthene	1800	D		ug/kg dry	2186.7	4450 U	82	45-130		
Fluorene	1930	D		ug/kg dry	2186.7	4450 U	88	45-120		
Hexachlorobenzene	1690	D		ug/kg dry	2186.7	4450 U	77	45-130		
Hexachlorobutadiene	1460	D		ug/kg dry	2186.7	4450 U	67	45-105		
Hexachlorocyclopentadiene	701	D		ug/kg dry	2186.7	4450 U	32	10-100		
Hexachloroethane	1450	D		ug/kg dry	2186.7	4450 U	66	35-110		
Indeno[1,2,3-cd]pyrene	1550	D		ug/kg dry	2186.7	4450 U	71	45-130		
Isophorone	1790	D		ug/kg dry	2186.7	4450 U	82	40-110		
Naphthalene	2010	D		ug/kg dry	2186.7	4450 U	92	40-110		
Nitrobenzene	1740	D		ug/kg dry	2186.7	4450 U	80	40-105		
N-Nitrosodi-n-propylamine	1800	D		ug/kg dry	2186.7	4450 U	82	30-130		
N-Nitrosodiphenylamine	1950	D		ug/kg dry	2186.7	4450 U	89	50-120		
Pentachlorophenol	0.00	U		ug/kg dry	2186.7	22200 U	*	25-120		
Phenanthrene	2020	D		ug/kg dry	2186.7	4450 U	93	50-120		
Phenol	1820	D		ug/kg dry	2186.7	4450 U	83	40-115		
Pyrene	2080	D		ug/kg dry	2186.7	4450 U	95	45-125		
Surrogate: 2-Fluorophenol	*2280*			*ug/kg dry*	*2733.4*		*84*	*25-121*		
Surrogate: Phenol-d5	*2440*			*ug/kg dry*	*2733.4*		*89*	*24-113*		
Surrogate: Nitrobenzene-d5	*1530*			*ug/kg dry*	*1822.3*		*84*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1610*			*ug/kg dry*	*1822.3*		*88*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*322*			*ug/kg dry*	*2733.4*		*12**	*19-122*		
Surrogate: p-Terphenyl-d14	*1800*			*ug/kg dry*	*1822.3*		*99*	*18-137*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	05/08/2012 12:54

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 L204317 - SW 3540C										
Matrix Spike Dup (L204317-MSD1)		**Source: 1204080-01**		Prepared: 04/30/2012 Analyzed: 05/03/2012						
1,2,4-Trichlorobenzene	1610	D		ug/kg dry	2159.8	4450 U	74	45-110	8	40
1,2-Dichlorobenzene	1680	D		ug/kg dry	2159.8	4450 U	78	45-105	4	40
1,3-Dichlorobenzene	1510	D		ug/kg dry	2159.8	4450 U	70	40-100	2	40
1,4-Dichlorobenzene	1560	D		ug/kg dry	2159.8	4450 U	72	35-105	3	40
2,4,5-Trichlorophenol	1000	D		ug/kg dry	2159.8	4450 U	46	30-140	38	40
2,4,6-Trichlorophenol	826	D		ug/kg dry	2159.8	4450 U	38	20-110	33	40
2,4-Dichlorophenol	1600	D		ug/kg dry	2159.8	4450 U	74	40-110	14	40
2,4-Dimethylphenol	1620	D		ug/kg dry	2159.8	4450 U	75	30-105	0.2	40
2,4-Dinitrophenol	900	D		ug/kg dry	2159.8	22200 U	42	25-130	13	40
2,4-Dinitrotoluene	1830	D		ug/kg dry	2159.8	4450 U	85	50-115	9	40
2,6-Dinitrotoluene	1810	D		ug/kg dry	2159.8	4450 U	84	40-120	4	40
2-Chloronaphthalene	1830	D		ug/kg dry	2159.8	4450 U	85	45-115	4	40
2-Chlorophenol	1870	D		ug/kg dry	2159.8	4450 U	87	45-105	7	40
2-Methylnaphthalene	1900	D		ug/kg dry	2159.8	4450 U	88	45-110	4	40
2-Methylphenol	1980	D		ug/kg dry	2159.8	4450 U	92	40-120	4	40
2-Nitroaniline	1800	D		ug/kg dry	2159.8	22200 U	84	45-120	4	40
2-Nitrophenol	1660	D		ug/kg dry	2159.8	4450 U	77	40-110	11	40
3,3'-Dichlorobenzidine	814	D		ug/kg dry	2159.8	8900 U	38	15-130	18	40
3-Nitroaniline	1820	D		ug/kg dry	2159.8	22200 U	84	40-130	7	40
4,6-Dinitro-2-methylphenol	1510	D		ug/kg dry	2159.8	4450 U	70	20-140	12	40
4-Bromophenyl Phenyl Ether	1720	D		ug/kg dry	2159.8	4450 U	79	45-115	7	40
4-Chloro-3-methylphenol	2070	D		ug/kg dry	2159.8	4450 U	96	35-115	22	40
4-Chloroaniline	1650	D		ug/kg dry	2159.8	4450 U	76	10-100	4	40
4-Chlorophenyl Phenyl Ether	1780	D		ug/kg dry	2159.8	4450 U	83	45-110	2	40
3- and/or 4-Methylphenol	1700	D		ug/kg dry	2159.8	4450 U	79	40-120	3	40
4-Nitroaniline	1460	D		ug/kg dry	2159.8	22200 U	68	40-130	2	40
4-Nitrophenol	701	D		ug/kg dry	2159.8	22200 U	32	15-140	32	40
Acenaphthene	1940	D		ug/kg dry	2159.8	4450 U	90	45-110	4	40
Acenaphthylene	1640	D		ug/kg dry	2159.8	4450 U	76	45-115	0.9	40
Anthracene	1990	D		ug/kg dry	2159.8	4450 U	92	45-130	4	40
Benz[a]anthracene	1850	D		ug/kg dry	2159.8	4450 U	86	45-130	3	40
Benzo[a] pyrene	1390	D		ug/kg dry	2159.8	4450 U	64	45-130	3	40
Benzo[b] fluoranthene	1570	D		ug/kg dry	2159.8	4450 U	73	40-130	3	40
Benzo[g,h,i] perylene	1590	D		ug/kg dry	2159.8	4450 U	74	45-125	2	40
Benzo[k] fluoranthene	1550	D		ug/kg dry	2159.8	4450 U	72	45-125	4	40
Bis(2-chloroethoxy) methane	2080	D		ug/kg dry	2159.8	4450 U	96	45-110	7	40

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/08/2012 12:54

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 L204317 - SW 3540C										
Matrix Spike Dup (L204317-MSD1)		**Source: 1204080-01**		Prepared: 04/30/2012 Analyzed: 05/03/2012						
Bis(2-chloroethyl) ether	1860	D		ug/kg dry	2159.8	4450 U	86	40-110	11	40
Bis(2-chloroisopropyl) ether	2140	D		ug/kg dry	2159.8	4450 U	99	30-115	8	40
Bis(2-ethylhexyl) phthalate	2030	D		ug/kg dry	2159.8	4450 U	94	40-145	6	40
Butyl Benzyl Phthalate	2280	D		ug/kg dry	2159.8	4450 U	105	50-125	7	40
Carbazole	2220	D		ug/kg dry	2159.8	4450 U	103	40-140	2	40
Chrysene	1970	D		ug/kg dry	2159.8	4450 U	91	45-130	4	40
Dibenz[a,h]anthracene	1480	D		ug/kg dry	2159.8	4450 U	68	45-125	2	40
Dibenzofuran	2000	D		ug/kg dry	2159.8	4450 U	93	45-120	0.9	40
Diethyl Phthalate	2020	D		ug/kg dry	2159.8	4450 U	93	50-125	5	40
Dimethyl Phthalate	1860	D		ug/kg dry	2159.8	4450 U	86	45-130	2	40
Di-n-butyl Phthalate	2020	D		ug/kg dry	2159.8	4450 U	94	50-130	2	40
Di-n-octyl Phthalate	1760	D		ug/kg dry	2159.8	4450 U	81	40-150	8	40
Fluoranthene	1770	D		ug/kg dry	2159.8	4450 U	82	45-130	0.2	40
Fluorene	1940	D		ug/kg dry	2159.8	4450 U	90	45-120	2	40
Hexachlorobenzene	1750	D		ug/kg dry	2159.8	4450 U	81	45-130	4	40
Hexachlorobutadiene	1530	D		ug/kg dry	2159.8	4450 U	71	45-105	6	40
Hexachlorocyclopentadiene	697	D		ug/kg dry	2159.8	4450 U	32	10-100	0.7	40
Hexachloroethane	1410	D		ug/kg dry	2159.8	4450 U	65	35-110	1	40
Indeno[1,2,3-cd]pyrene	1530	D		ug/kg dry	2159.8	4450 U	71	45-130	0.2	40
Isophorone	1910	D		ug/kg dry	2159.8	4450 U	89	40-110	8	40
Naphthalene	2140	D		ug/kg dry	2159.8	4450 U	99	40-110	7	40
Nitrobenzene	1880	D		ug/kg dry	2159.8	4450 U	87	40-105	9	40
N-Nitrosodi-n-propylamine	1900	D		ug/kg dry	2159.8	4450 U	88	30-130	6	40
N-Nitrosodiphenylamine	1990	D		ug/kg dry	2159.8	4450 U	92	50-120	3	40
Pentachlorophenol	0.00	U		ug/kg dry	2159.8	22200 U	*	25-120		40
Phenanthrene	2080	D		ug/kg dry	2159.8	4450 U	96	50-120	4	40
Phenol	1850	D		ug/kg dry	2159.8	4450 U	86	40-115	3	40
Pyrene	2370	D		ug/kg dry	2159.8	4450 U	110	45-125	14	40
Surrogate: 2-Fluorophenol	*2290*			*ug/kg dry*	*2699.8*		*85*	*25-121*		
Surrogate: Phenol-d5	*2310*			*ug/kg dry*	*2699.8*		*86*	*24-113*		
Surrogate: Nitrobenzene-d5	*1490*			*ug/kg dry*	*1799.9*		*83*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1490*			*ug/kg dry*	*1799.9*		*83*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*508*			*ug/kg dry*	*2699.8*		*19*	*19-122*		
Surrogate: p-Terphenyl-d14	*1850*			*ug/kg dry*	*1799.9*		*103*	*18-137*		

PREPARATION BENCH SHEET

L204317

Lionville Laboratory

Printed: 5/1/2012 3:20:11PM

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
1204080-01	8270C TCL SVOC	04/30/2012 15:00	28.9	4				500	WC-Hanford, Inc.	
1204092-01	8270C TCL SVOC	04/30/2012 15:00	4.95	4				500	WC-Hanford, Inc.	
L204317-BLK1	QC	04/30/2012 15:00	30	1				500		
L204317-BS1	QC	04/30/2012 15:00	30	1	1200337		600	500		
L204317-MS1	QC	04/30/2012 15:00	29.7	4	1200337	1204080-01	600	500		
L204317-MS2	QC	04/30/2012 15:00	4.95	4	1200337	1204092-01	600	500		
L204317-MSD1	QC	04/30/2012 15:00	30.07	4	1200337	1204080-01	600	500		
L204317-MSD2	QC	04/30/2012 15:00	4.9	4	1200337	1204092-01	600	500		

5/1/12 1520

Extracts Relinquished By Date

5/2/12 1050

Extracts Received By Date

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/11/2012 10:51

Analytical Report for TCLP Semivolatiles by SW846 1311/8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080 **Date Received:** 04-25-2012

SEMIVOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 04-19-2012.

The sample and associated QC samples were leached 04-30-2012, extracted 05-07-2012 and analyzed 05-09,10-2012 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. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.

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

3. Non-target compounds were not reported in the sample.

4. The sample was extracted at 5-fold dilutions due to the leachate matrix; however, all TCLP regulatory limits were achieved.

5. All obtainable surrogate recoveries were within acceptance criteria.

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. Internal standard area and retention time criteria were met.

11. 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").

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. 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

5/11/12
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 concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

MP	-	Missed Peak: Manually added peak not found by automatic quantitation program.
PA	-	Peak Assignment: quantitation report was changed to reflect correct peak assignment.
RI	-	Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column.
SP	-	Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
CB	-	Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/11/2012 10:51

J1P118
1204080-01 (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	L205037	05/07/2012	05/10/2012	8270C
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
2-Methylphenol	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Hexachlorobenzene	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Hexachlorobutadiene	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Hexachloroethane	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Nitrobenzene	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Pentachlorophenol	0.125	U	0.125	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Pyridine	0.0500	U	0.0500	mg/L	1	L205037	05/07/2012	05/10/2012	8270C
Surrogate: 2-Fluorophenol	*70 %*		*21-100*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*
Surrogate: Phenol-d5	*74 %*		*10-94*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*73 %*		*35-114*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*62 %*		*43-116*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*69 %*		*10-123*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*88 %*		*33-141*			*L205037*	*05/07/2012*	*05/10/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	05/11/2012 10:51

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 L205037 - SW 3520C										
Blank (L205037-BLK1)				Prepared: 05/07/2012 Analyzed: 05/09/2012						
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	*0.304*			*mg/L*	*0.37500*		*81*	*21-100*		
Surrogate: Phenol-d5	*0.310*			*mg/L*	*0.37500*		*83*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.183*			*mg/L*	*0.25000*		*73*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.157*			*mg/L*	*0.25000*		*63*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.274*			*mg/L*	*0.37500*		*73*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.238*			*mg/L*	*0.25000*		*95*	*33-141*		
Blank (L205037-BLK2)				Prepared: 05/07/2012 Analyzed: 05/09/2012						
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	*0.327*			*mg/L*	*0.37500*		*87*	*21-100*		
Surrogate: Phenol-d5	*0.337*			*mg/L*	*0.37500*		*90*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.217*			*mg/L*	*0.25000*		*87*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.172*			*mg/L*	*0.25000*		*69*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.342*			*mg/L*	*0.37500*		*91*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.250*			*mg/L*	*0.25000*		*100*	*33-141*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/11/2012 10:51

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 L205037 - SW 3520C									
LCS (L205037-BS1)			Prepared: 05/07/2012 Analyzed: 05/09/2012						
1,4-Dichlorobenzene	0.151	0.0500	mg/L	0.30000		50	30-100		
2,4,5-Trichlorophenol	0.226	0.0500	mg/L	0.30000		75	45-125		
2,4,6-Trichlorophenol	0.208	0.0500	mg/L	0.30000		69	40-125		
2,4-Dinitrotoluene	0.233	0.0500	mg/L	0.30000		78	50-120		
2-Methylphenol	0.205	0.0500	mg/L	0.30000		68	40-110		
3- and/or 4-Methylphenol	0.217	0.0500	mg/L	0.30000		72	30-110		
Hexachlorobenzene	0.231	0.0500	mg/L	0.30000		77	50-110		
Hexachlorobutadiene	0.167	0.0500	mg/L	0.30000		56	30-100		
Hexachloroethane	0.133	0.0500	mg/L	0.30000		44	25-100		
Nitrobenzene	0.212	0.0500	mg/L	0.30000		71	40-110		
Pentachlorophenol	0.192	0.125	mg/L	0.30000		64	20-130		
Pyridine	0.242	0.0500	mg/L	0.30000		81	5-100		
Surrogate: 2-Fluorophenol	*0.311*		*mg/L*	*0.37500*		*83*	*21-100*		
Surrogate: Phenol-d5	*0.309*		*mg/L*	*0.37500*		*82*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.196*		*mg/L*	*0.25000*		*78*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.180*		*mg/L*	*0.25000*		*72*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.322*		*mg/L*	*0.37500*		*86*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.208*		*mg/L*	*0.25000*		*83*	*33-141*		
Matrix Spike (L205037-MS1)		**Source: 1204080-01**	Prepared: 05/07/2012 Analyzed: 05/10/2012						
1,4-Dichlorobenzene	0.162	0.0500	mg/L	0.30000	0.0500 U	54	30-100		
2,4,5-Trichlorophenol	0.247	0.0500	mg/L	0.30000	0.0500 U	82	45-125		
2,4,6-Trichlorophenol	0.220	0.0500	mg/L	0.30000	0.0500 U	73	40-125		
2,4-Dinitrotoluene	0.259	0.0500	mg/L	0.30000	0.0500 U	86	50-120		
2-Methylphenol	0.231	0.0500	mg/L	0.30000	0.0500 U	77	40-110		
3- and/or 4-Methylphenol	0.231	0.0500	mg/L	0.30000	0.0500 U	77	30-110		
Hexachlorobenzene	0.252	0.0500	mg/L	0.30000	0.0500 U	84	50-110		
Hexachlorobutadiene	0.166	0.0500	mg/L	0.30000	0.0500 U	55	30-100		
Hexachloroethane	0.137	0.0500	mg/L	0.30000	0.0500 U	46	25-100		
Nitrobenzene	0.223	0.0500	mg/L	0.30000	0.0500 U	74	40-110		
Pentachlorophenol	0.326	0.125	mg/L	0.30000	0.125 U	109	20-130		
Pyridine	0.190	0.0500	mg/L	0.30000	0.0500 U	63	5-100		
Surrogate: 2-Fluorophenol	*0.309*		*mg/L*	*0.37500*		*82*	*21-100*		
Surrogate: Phenol-d5	*0.313*		*mg/L*	*0.37500*		*83*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.193*		*mg/L*	*0.25000*		*77*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.182*		*mg/L*	*0.25000*		*73*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.332*		*mg/L*	*0.37500*		*88*	*10-123*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/11/2012 10:51

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 L205037 - SW 3520C									
Matrix Spike (L205037-MS1)		**Source: 1204080-01**	Prepared: 05/07/2012 Analyzed: 05/10/2012						
Surrogate: p-Terphenyl-d14	*0.222*		*mg/L*	*0.25000*		*89*	*33-141*		
Matrix Spike Dup (L205037-MSD1)		**Source: 1204080-01**	Prepared: 05/07/2012 Analyzed: 05/10/2012						
1,4-Dichlorobenzene	0.184	0.0500	mg/L	0.30000	0.0500 U	61	30-100	13	20
2,4,5-Trichlorophenol	0.245	0.0500	mg/L	0.30000	0.0500 U	82	45-125	0.6	20
2,4,6-Trichlorophenol	0.220	0.0500	mg/L	0.30000	0.0500 U	73	40-125	0.3	20
2,4-Dinitrotoluene	0.255	0.0500	mg/L	0.30000	0.0500 U	85	50-120	2	20
2-Methylphenol	0.220	0.0500	mg/L	0.30000	0.0500 U	73	40-110	5	20
3- and/or 4-Methylphenol	0.226	0.0500	mg/L	0.30000	0.0500 U	75	30-110	2	20
Hexachlorobenzene	0.248	0.0500	mg/L	0.30000	0.0500 U	83	50-110	2	20
Hexachlorobutadiene	0.196	0.0500	mg/L	0.30000	0.0500 U	65	30-100	16	20
Hexachloroethane	0.166	0.0500	mg/L	0.30000	0.0500 U	55	25-100	19	20
Nitrobenzene	0.218	0.0500	mg/L	0.30000	0.0500 U	73	40-110	2	20
Pentachlorophenol	0.336	0.125	mg/L	0.30000	0.125 U	112	20-130	3	20
Pyridine	0.177	0.0500	mg/L	0.30000	0.0500 U	59	5-100	7	20
Surrogate: 2-Fluorophenol	*0.307*		*mg/L*	*0.37500*		*82*	*21-100*		
Surrogate: Phenol-d5	*0.308*		*mg/L*	*0.37500*		*82*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.196*		*mg/L*	*0.25000*		*79*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.183*		*mg/L*	*0.25000*		*73*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.345*		*mg/L*	*0.37500*		*92*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.218*		*mg/L*	*0.25000*		*87*	*33-141*		

onville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1116

art Date: 4-30-12 art Time: 12:37 alyst: RH DP: SPI-1311.1	End Date: 5-1-12 End Time: 6:00 Analyst: RH Method: 1311.1	Tumbler Speed: 31 RPM Leachate Batch #: L204309 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 **Room Temp. Acceptance Criteria:** **23°C ± 2°**

L #: 1204080-01 ient ID#: JIP118 H After 5 Min: 8.15 H After Acid/Heat: 1.12 traction Fluid/pH: #1 4.90 ample Wt.(g): 50 tract Fluid Vol.(mL): 1000 H After Extraction: 4.66	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
L #: 1204093-01 ient ID#: JIP146 H After 5 Min: 8.42 H After Acid/Heat: 1.05 traction Fluid/pH: #1 4.90 ample Wt.(g): 25 tract Fluid Vol.(mL): 500 H After Extraction: 4.67	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
L # L204309 ient ID#: N/A H After 5 Min: N/A H After Acid/Heat: N/A traction Fluid/pH: N/A ample Wt.(g): N/A tract Fluid Vol.(mL): N/A H After Extraction: N/A	Initial Filtration Data and Comments: Solids: _____% / NA Blank Initial Filtrate Added: _____
L #: _____ lient ID#: _____ H After 5 Min: _____ H After Acid/Heat: _____ xtraction Fluid/pH: _____ ample Wt.(g): _____ xtract Fluid Vol.(mL): _____ H After Extraction: _____	Initial Filtration Data and Comments: Solids: _____% / NA 4-30-12 RH Initial Filtrate Added: _____

andard	ID	Prep Date	Expir Date	pH Acceptance Criteria
uid #1	1200533	4/18/12	10/18/12	4.93 ± 0.05
uid # 2			RH	2.88 ± 0.05

SPI-1311.1-A-0310

Reviewed By/Date [signature] 5/3/12

Page # 1

000000064

PREPARATION BENCH SHEET

L205037

Lionville Laboratory

Printed: 5/11/2012 10:24:51AM

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
1204080-01	1311/8270C TCLP SVOC	05/07/2012 10:59	200	1				500	WC-Hanford, Inc.	WCH
1204080-01RE1	8270C TCL SVOC	05/07/2012 10:59	1000	1				500	WC-Hanford, Inc.	Added for BatchQC in: L205037
1205003-09	8270C TCL SVOC	05/07/2012 10:59	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 1, Report @LOD
1205006-01	1311/8270C TCLP SVOC	05/07/2012 10:59	200	1				500	WC-Hanford, Inc.	WCH
1205006-01RE1	8270C TCL SVOC	05/07/2012 10:59	1000	1				500	WC-Hanford, Inc.	Added for BatchQC in: L205037
L205037-BLK1	QC	05/07/2012 10:59	200	1				500		WCH TCLP
L205037-BLK2	QC	05/07/2012 10:59	200	1				500		Leach Blank L204309, associated with 1204080
L205037-BLK3	QC	05/07/2012 10:59	200	1				500		Leach Blank L205016, associated with 1205006
L205037-BLK4	QC	05/07/2012 10:59	1000	1				500		Table 1
L205037-BS1	QC	05/07/2012 10:59	200	1	1200337		600	500		WCH TCLP
L205037-BS4	QC	05/07/2012 10:59	1000	1	1200337		600	500		Table 1
L205037-MS1	QC	05/07/2012 10:59	200	1	1200337	1204080-01	600	500		WCH TCLP
L205037-MS2	QC	05/07/2012 10:59	200	1	1200337	1205006-01	600	500		WCH TCLP
L205037-MSD1	QC	05/07/2012 10:59	200	1	1200337	1204080-01	600	500		WCH TCLP
L205037-MSD2	QC	05/07/2012 10:59	200	1	1200337	1205006-01	600	500		WCH TCLP

Adjusted initial volume Blk1, BS1 BCS 5/11/12

Extracts Relinquished By Date Extracts Received By Date

PREPARATION BENCH SHEET

L205037

Lionville Laboratory

Printed: 5/9/2012 11:49:17AM

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
1204080-01	1311/8270C TCLP SVOC	05/07/2012 10:59	200	1				500	WC-Hanford, Inc.	WCH
~~1204080-01RE1~~	~~8270C TCL SVOC~~	~~05/07/2012 10:59~~	~~1000~~	~~1~~				~~500~~	~~WC-Hanford, Inc.~~	~~Added for BatchQC in: L205037~~
1205003-09	8270C TCL SVOC	05/07/2012 10:59	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 1, Report @LOD
1205006-01	1311/8270C TCLP SVOC	05/07/2012 10:59	200	1				500	WC-Hanford, Inc.	WCH
~~1205006-01RE1~~	~~8270C TCL SVOC~~	~~05/07/2012 10:59~~	~~1000~~	~~1~~				~~500~~	~~WC-Hanford, Inc.~~	~~Added for BatchQC in: L205037~~
L205037-BLK1	QC	05/07/2012 10:59	1000	1				500		WCH TCLP
L205037-BLK2	QC	05/07/2012 10:59	200	1				500		Leach Blank L204309, associated with 1204080
L205037-BLK3	QC	05/07/2012 10:59	200	1				500		Leach Blank L205016, associated with 1205006
L205037-BLK4	QC	05/07/2012 10:59	1000	1				500		Table 1
L205037-BS1	QC	05/07/2012 10:59	1000	1	1200337		600	500		WCH TCLP
L205037-BS4	QC	05/07/2012 10:59	1000	1	1200337		600	500		Table 1
L205037-MS1	QC	05/07/2012 10:59	200	1	1200337	1204080-01	600	500		WCH TCLP
L205037-MS2	QC	05/07/2012 10:59	200	1	1200337	1205006-01	600	500		WCH TCLP
L205037-MSD1	QC	05/07/2012 10:59	200	1	1200337	1204080-01	600	500		WCH TCLP
L205037-MSD2	QC	05/07/2012 10:59	200	1	1200337	1205006-01	600	500		WCH TCLP

Extracts Relinquished By — 5/9/12 1200 Date

Extracts Received By — 5/9/12 1215 Date

PCBS

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

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/12/2012 08:25

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Received: 04-25-2012

PCBs

One (1) soil sample was collected on 04-19-2012.

The sample and associated QC samples were extracted 05-03-2012 and analyzed 05-08,09,10-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8082. All samples received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

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

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

Iain Daniels
LvL Laboratory Manager

5/14/12
Date

r:\group\data\2012\pcb\wc hanford\1204080jes.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.

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/12/2012 08:25

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1221	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1232	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1242	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1248	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1254	**5.32**	J	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1260	**4.46**	J	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1262	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Aroclor 1268	14.3	U	14.3	ug/kg dry	1	L205024	05/03/2012	05/09/2012	8082
Surrogate: Decachlorobiphenyl	*98 %*		*43-144*			*L205024*	*05/03/2012*	*05/09/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*91 %*		*52-141*			*L205024*	*05/03/2012*	*05/09/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/12/2012 08:25

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 L205024 - SW 3540C										
Blank (L205024-BLK1)				Prepared: 05/03/2012 Analyzed: 05/08/2012						
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	*33.3*			*ug/kg wet*	*33.333*		*100*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.7*			*ug/kg wet*	*33.337*		*107*	*52-141*		
LCS (L205024-BS1)				Prepared: 05/03/2012 Analyzed: 05/08/2012						
Aroclor 1016	143		13.3	ug/kg wet	166.67		86	50-138		
Aroclor 1260	161		13.3	ug/kg wet	166.67		97	50-148		
Surrogate: Decachlorobiphenyl	*32.7*			*ug/kg wet*	*33.333*		*98*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.0*			*ug/kg wet*	*33.337*		*105*	*52-141*		
Matrix Spike (L205024-MS2)		**Source: 1204080-01**		Prepared: 05/03/2012 Analyzed: 05/09/2012						
Aroclor 1016	142		14.1	ug/kg dry	176.12	14.3 U	81	50-138		
Aroclor 1260	167		14.1	ug/kg dry	176.12	4.46	93	50-148		
Surrogate: Decachlorobiphenyl	*34.8*			*ug/kg dry*	*35.224*		*99*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*30.7*			*ug/kg dry*	*35.228*		*87*	*52-141*		
Matrix Spike Dup (L205024-MSD2)		**Source: 1204080-01**		Prepared: 05/03/2012 Analyzed: 05/10/2012						
Aroclor 1016	159		14.2	ug/kg dry	177.62	14.3 U	90	50-138	10	40
Aroclor 1260	184		14.2	ug/kg dry	177.62	4.46	101	50-148	9	40
Surrogate: Decachlorobiphenyl	*37.8*			*ug/kg dry*	*35.525*		*106*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.8*			*ug/kg dry*	*35.528*		*98*	*52-141*		

PREPARATION BENCH SHEET

L205024

Lionville Laboratory

Printed: 5/8/2012 11:54:33AM

000000072

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
1204069-01	8082 PCBs	05/03/2012 12:20	15.23	10				250	WC-Hanford, Inc.	RADH
1204080-01	8082 PCBs	05/03/2012 12:20	30.12	10				250	WC-Hanford, Inc.	
1205006-01	8082 PCBs	05/03/2012 12:20	25.17	10				250	WC-Hanford, Inc.	
1205007-01	8082 PCBs	05/03/2012 12:20	10.86	10				250	WC-Hanford, Inc.	
1205008-01	8082 PCBs	05/03/2012 12:20	10.05	10				250	WC-Hanford, Inc.	
1205008-02	8082 PCBs	05/03/2012 12:20	10.13	10				250	WC-Hanford, Inc.	
1205008-03	8082 PCBs	05/03/2012 12:20	20.13	10				250	WC-Hanford, Inc.	
1205008-04	8082 PCBs	05/03/2012 12:20	21.85	10				250	WC-Hanford, Inc.	
L205024-BLK1	QC	05/03/2012 12:20	30	10				250		
L205024-BS1	QC	05/03/2012 12:20	30	10	1200123		250	250		
L205024-MS1	QC	05/03/2012 12:20	15.3	10	1200123	1204069-01	250	250		
L205024-MS2	QC	05/03/2012 12:20	30.73	10	1200123	1204080-01	250	250		
L205024-MS3	QC	05/03/2012 12:20	25.17	10	1200123	1205006-01	250	250		
L205024-MS4	QC	05/03/2012 12:20	10.17	10	1200123	1205007-01	250	250		
L205024-MS5	QC	05/03/2012 12:20	10.01	10	1200123	1205008-01	250	250		
L205024-MSD1	QC	05/03/2012 12:20	15.19	10	1200123	1204069-01	250	250		
L205024-MSD2	QC	05/03/2012 12:20	30.47	10	1200123	1204080-01	250	250		
L205024-MSD3	QC	05/03/2012 12:20	25.24	10	1200123	1205006-01	250	250		
L205024-MSD4	QC	05/03/2012 12:20	10.43	10	1200123	1205007-01	250	250		
L205024-MSD5	QC	05/03/2012 12:20	10.15	10	1200123	1205008-01	250	250		

S cleaned 05.08.12 SZ (CH 616W031)

5/8/12 1210
Extracts Relinquished By — Date

S Lak 05.08.12 12:10
Extracts Received By — Date

DIESEL

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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/13/2012 07:53

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Date Received: 04-25-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 04-19-2012.

The sample and associated QC samples were extracted 05-03-2012 and analyzed 05-126-2012 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C and the analysis procedure was based on SW846 Method 8015B for Diesel Range Organics.

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

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

Iain Daniels
LvL Laboratory Manager

5/14/12
Date

r:\group\data\2012\dro\wc hanford\1204080jes.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

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/13/2012 07:53

J1P118

1204080-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	3580	U	3580	ug/kg dry	1	L205023	05/03/2012	05/12/2012	8015M
Motor Oil	**4500**	J	10700	ug/kg dry	1	L205023	05/03/2012	05/12/2012	8015M
Surrogate: p-Terphenyl	*93 %*		*39-129*			*L205023*	*05/03/2012*	*05/12/2012*	*8015M*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/13/2012 07:53

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 L205023 - SW 3540C										
Blank (L205023-BLK1)				Prepared: 05/03/2012 Analyzed: 05/12/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*7850*			*ug/kg wet*	*6666.7*		*118*	*39-129*		
LCS (L205023-BS1)				Prepared: 05/03/2012 Analyzed: 05/12/2012						
Diesel Range Organics	65600		3330	ug/kg wet	66667		98	42-133		40
Surrogate: p-Terphenyl	*7360*			*ug/kg wet*	*6666.7*		*110*	*39-129*		
Matrix Spike (L205023-MS1)		**Source: 1204080-01**		Prepared: 05/03/2012 Analyzed: 05/12/2012						
Diesel Range Organics	70700		3540	ug/kg dry	70794	3580 U	100	42-133		40
Surrogate: p-Terphenyl	*7800*			*ug/kg dry*	*7079.4*		*110*	*39-129*		
Matrix Spike Dup (L205023-MSD1)		**Source: 1204080-01**		Prepared: 05/03/2012 Analyzed: 05/12/2012						
Diesel Range Organics	62900		3550	ug/kg dry	70933	3580 U	89	42-133	12	40
Surrogate: p-Terphenyl	*7010*			*ug/kg dry*	*7093.3*		*99*	*39-129*		

PREPARATION BENCH SHEET

L205023

Lionville Laboratory

Printed: 5/7/2012 1:37:29PM

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
1204080-01	8015M DRO	05/03/2012 12:07	30.21	1				1000	WC-Hanford, Inc.	
1205006-01	8015M DRO	05/03/2012 12:07	30.64	1				1000	WC-Hanford, Inc.	
1205007-01	8015M DRO	05/03/2012 12:07	10.08	4				1000	WC-Hanford, Inc.	
1205008-01	8015M DRO	05/03/2012 12:07	20.44	1				1000	WC-Hanford, Inc.	
1205008-02	8015M DRO	05/03/2012 12:07	21.81	4				1000	WC-Hanford, Inc.	
1205008-03	8015M DRO	05/03/2012 12:07	22.28	4				1000	WC-Hanford, Inc.	
1205008-04	8015M DRO	05/03/2012 12:07	20.13	1				1000	WC-Hanford, Inc.	
L205023-BLK1	QC	05/03/2012 12:07	30	1				1000		
L205023-BS1	QC	05/03/2012 12:07	30	1	1101936		1000	1000		
L205023-MS1	QC	05/03/2012 12:07	30.58	1	1101936	1204080-01	1000	1000		
L205023-MS2	QC	05/03/2012 12:07	30.42	1	1101936	1205006-01	1000	1000		
L205023-MS3	QC	05/03/2012 12:07	11.02	4	1101936	1205007-01	1000	1000		
L205023-MS4	QC	05/03/2012 12:07	21.69	4	1101936	1205008-03	1000	1000		
L205023-MSD1	QC	05/03/2012 12:07	30.52	1	1101936	1204080-01	1000	1000		
L205023-MSD2	QC	05/03/2012 12:07	30.49	1	1101936	1205006-01	1000	1000		
L205023-MSD3	QC	05/03/2012 12:07	10.63	4	1101936	1205007-01	1000	1000		
L205023-MSD4	QC	05/03/2012 12:07	20.48	4	1101936	1205008-03	1000	1000		

5/7/12 1350
Extracts Relinquished By Date

LC 5/8/12
Extracts Received By Date

PAHs

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 21:44

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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Exton, Pennsylvania 19341
Phone (610) 280-3000
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Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL #: 1204080

W.O. #: 60049-001-001-0001-00
Date Received: 04-25-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 04-19-2012.

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

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

1. Discrepancies from the sample acceptance policy have been recorded on the Sample Receipt Checklist.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of sixteen (16) blank spike recoveries were outside acceptance criteria. The recovery for Naphthalene was biased high. There is no impact on the data.
6. All matrix spike recoveries were within acceptance criteria.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. The sample was reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this 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

5/11/12
Date

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LIONVILLE LABORATORY INC.

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/10/2012 16:16

J1P118
1204080-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Acenaphthylene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Acenaphthene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Fluorene	**2.26**	J	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Phenanthrene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Anthracene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Fluoranthene	**2.48**	J	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Indeno[1,2,3-cd]pyrene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Pyrene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Benz[a]anthracene	**0.956**	J	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Chrysene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Benzo[b] fluoranthene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Benzo[k] fluoranthene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Benzo[a] pyrene	**1.49**	J	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Dibenz[a,h]anthracene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Benzo[g,h,i] perylene	3.67	U	3.67	ug/kg dry	1	L204312	04/30/2012	05/08/2012	8310
Surrogate: Triphenylene	*84 %*		*68-129*			*L204312*	*04/30/2012*	*05/08/2012*	*8310*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 21:44

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 L204312 - SW 3540C										
Blank (L204312-BLK1)				Prepared: 04/30/2012 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	3.33	U	3.33	ug/kg wet						
Phenanthrene	3.33	U	3.33	ug/kg wet						
Anthracene	3.33	U	3.33	ug/kg wet						
Fluoranthene	3.33	U	3.33	ug/kg wet						
Indeno[1,2,3-cd]pyrene	3.33	U	3.33	ug/kg wet						
Pyrene	3.33	U	3.33	ug/kg wet						
Benz[a]anthracene	3.33	U	3.33	ug/kg wet						
Chrysene	3.33	U	3.33	ug/kg wet						
Benzo[b] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[k] fluoranthene	3.33	U	3.33	ug/kg wet						
Benzo[a] pyrene	3.33	U	3.33	ug/kg wet						
Dibenz[a,h]anthracene	3.33	U	3.33	ug/kg wet						
Benzo[g,h,i] perylene	3.33	U	3.33	ug/kg wet						
Surrogate: Triphenylene	*151*			*ug/kg wet*	*166.67*		*91*	*68-129*		
LCS (L204312-BS1)				Prepared: 04/30/2012 Analyzed: 05/08/2012						
Naphthalene	218		3.33	ug/kg wet	166.67		131*	0-127		
Acenaphthylene	129		3.33	ug/kg wet	166.67		78	50-140		
Acenaphthene	129		3.33	ug/kg wet	166.67		77	17-139		
Fluorene	140		3.33	ug/kg wet	166.67		84	28-145		
Phenanthrene	149		3.33	ug/kg wet	166.67		89	30-152		
Anthracene	111		3.33	ug/kg wet	166.67		67	19-171		
Fluoranthene	155		3.33	ug/kg wet	166.67		93	34-159		
Indeno[1,2,3-cd]pyrene	157		3.33	ug/kg wet	166.67		94	31-156		
Pyrene	145		3.33	ug/kg wet	166.67		87	33-152		
Benz[a]anthracene	163		3.33	ug/kg wet	166.67		98	32-157		
Chrysene	151		3.33	ug/kg wet	166.67		91	31-159		
Benzo[b] fluoranthene	159		3.33	ug/kg wet	166.67		96	33-164		
Benzo[k] fluoranthene	151		3.33	ug/kg wet	166.67		91	28-161		
Benzo[a] pyrene	181		3.33	ug/kg wet	166.67		109	29-149		
Dibenz[a,h]anthracene	138		3.33	ug/kg wet	166.67		83	27-153		
Benzo[g,h,i] perylene	156		3.33	ug/kg wet	166.67		94	32-157		
Surrogate: Triphenylene	*146*			*ug/kg wet*	*166.67*		*88*	*68-129*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/10/2012 16:16

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 L204312 - SW 3540C									
Matrix Spike (L204312-MS1)		**Source: 1204080-01**	Prepared: 04/30/2012 Analyzed: 05/08/2012						
Naphthalene	162	3.54	ug/kg dry	177.33	3.67 U	92	0-127		
Acenaphthylene	108	3.54	ug/kg dry	177.33	3.67 U	61	50-140		
Acenaphthene	138	3.54	ug/kg dry	177.33	3.67 U	78	17-139		
Fluorene	105	3.54	ug/kg dry	177.33	2.26	58	28-145		
Phenanthrene	111	3.54	ug/kg dry	177.33	3.67 U	63	30-152		
Anthracene	82.2	3.54	ug/kg dry	177.33	3.67 U	46	19-171		
Fluoranthene	109	3.54	ug/kg dry	177.33	2.48	60	34-159		
Indeno[1,2,3-cd]pyrene	97.2	3.54	ug/kg dry	177.33	3.67 U	55	31-156		
Pyrene	101	3.54	ug/kg dry	177.33	3.67 U	57	33-152		
Benz[a]anthracene	112	3.54	ug/kg dry	177.33	0.956	63	32-157		
Chrysene	106	3.54	ug/kg dry	177.33	3.67 U	60	31-159		
Benzo[b] fluoranthene	83.4	3.54	ug/kg dry	177.33	3.67 U	47	33-164		
Benzo[k] fluoranthene	95.1	3.54	ug/kg dry	177.33	3.67 U	54	28-161		
Benzo[a] pyrene	128	3.54	ug/kg dry	177.33	1.49	72	29-149		
Dibenz[a,h]anthracene	87.1	3.54	ug/kg dry	177.33	3.67 U	49	27-153		
Benzo[g,h,i] perylene	93.1	3.54	ug/kg dry	177.33	3.67 U	52	32-157		
Surrogate: Triphenylene	*151*		*ug/kg dry*	*177.33*		*85*	*68-129*		
Matrix Spike Dup (L204312-MSD1)		**Source: 1204080-01**	Prepared: 04/30/2012 Analyzed: 05/08/2012						
Naphthalene	169	3.68	ug/kg dry	183.96	3.67 U	92	0-127	0.5	40
Acenaphthylene	136	3.68	ug/kg dry	183.96	3.67 U	74	50-140	19	40
Acenaphthene	131	3.68	ug/kg dry	183.96	3.67 U	71	17-139	9	40
Fluorene	142	3.68	ug/kg dry	183.96	2.26	76	28-145	26	40
Phenanthrene	159	3.68	ug/kg dry	183.96	3.67 U	86	30-152	32	40
Anthracene	121	3.68	ug/kg dry	183.96	3.67 U	66	19-171	35	40
Fluoranthene	167	3.68	ug/kg dry	183.96	2.48	89	34-159	39	40
Indeno[1,2,3-cd]pyrene	165	3.68	ug/kg dry	183.96	3.67 U	90	31-156	48*	40
Pyrene	158	3.68	ug/kg dry	183.96	3.67 U	86	33-152	40	40
Benz[a]anthracene	162	3.68	ug/kg dry	183.96	0.956	87	32-157	33	40
Chrysene	164	3.68	ug/kg dry	183.96	3.67 U	89	31-159	40	40
Benzo[b] fluoranthene	149	3.68	ug/kg dry	183.96	3.67 U	81	33-164	53*	40
Benzo[k] fluoranthene	155	3.68	ug/kg dry	183.96	3.67 U	84	28-161	44*	40
Benzo[a] pyrene	203	3.68	ug/kg dry	183.96	1.49	110	29-149	42*	40
Dibenz[a,h]anthracene	144	3.68	ug/kg dry	183.96	3.67 U	78	27-153	46*	40
Benzo[g,h,i] perylene	163	3.68	ug/kg dry	183.96	3.67 U	89	32-157	51*	40
Surrogate: Triphenylene	*167*		*ug/kg dry*	*183.96*		*91*	*68-129*		

PREPARATION BENCH SHEET

L204312

Lionville Laboratory

Printed: 5/2/2012 11:11:49AM

00000087

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
1204080-01	8310 PAH	04/30/2012 11:09	29.44	5				50	WC-Hanford, Inc.	
1204087-01	8310 PAH	04/30/2012 11:09	29.48	5				50	WC-Hanford, Inc.	
L204312-BLK1	QC	04/30/2012 11:09	30	5				50		
L204312-BS1	QC	04/30/2012 11:09	30	5	1200436		50	50		
L204312-MS1	QC	04/30/2012 11:09	30.52	5	1200436	1204080-01	50	50		
L204312-MS2	QC	04/30/2012 11:09	30.42	5	1200436	1204087-01	50	50		
L204312-MSD1	QC	04/30/2012 11:09	29.42	5	1200436	1204080-01	50	50		
L204312-MSD2	QC	04/30/2012 11:09	29.96	5	1200436	1204087-01	50	50		

5/2/12 11 11

Extracts Relinquished By Date

5/2/12

Extracts Received By Date

METALS

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/03/2012 10:49

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

LIONVILLE LABORATORY
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Case Narrative

Client: WC-HANFORD RC-228
LVL#: 1204080
SDG/SAF#: K3877/RC-228

W.O.#: 60049-001-001-0001-00
Date Received: 04-25-12

METALS

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

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

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

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

   The sample was analyzed and reported with a 3-fold dilution for ICP metals due to sample matrix.

3. All analyses were performed within the required holding times.

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvL's sample acceptance policy.

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

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

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

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer. The Potassium results were reported from Potassium line K-766.4-2. The SRM concentration for Potassium at a 3-fold dilution is above the linear range for Potassium line K-766.4-2. The Potassium SRM result was within the control limits and the sample result was within the linear range of Potassium line K-766.4-2.

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

10. The matrix spike (MS) recoveries for 5 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:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1P118	Aluminum	22,000	85.6
	Antimony	100	95.3
	Iron	42,000	76.1
	Silicon	1,100	99.0
	Silver	100	92.0

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Lithium 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

5/15/12
Date

alm/04-080

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/03/2012 10:49

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: K3877 Project Manager: Joan Kessner	**Reported:** 05/03/2012 10:49

J1P118
1204080-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**7360**		12.9	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Antimony	1.55	U	1.55	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Arsenic	**2.35**	B	2.58	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Barium	**79.7**		1.29	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Beryllium	**0.298**	B	0.515	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Boron	5.15	U	5.15	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Cadmium	0.515	U	0.515	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Calcium	**5000**		258	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Chromium	**9.49**		0.515	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Cobalt	**6.47**		5.15	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Copper	**12.2**		2.58	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Iron	**22100**		51.5	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Lead	**4.72**		1.29	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Lithium	**7.00**		6.44	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Magnesium	**4610**		193	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Manganese	**321**		12.9	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Molybdenum	5.15	U	5.15	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Nickel	**9.20**	B	10.3	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Potassium	**1390**		1030	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Selenium	0.773	U	0.773	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Silicon	**772**		5.15	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Silver	0.515	U	0.515	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Sodium	**245**		129	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Uranium	51.5	U	51.5	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Vanadium	**55.3**		6.44	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Zinc	**47.1**		25.8	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Zirconium	**19.2**		12.9	mg/kg dry	3	L204307	04/27/2012	05/01/2012	6010B
Mercury	0.0250	U	0.0250	mg/kg dry	1	L205006	05/01/2012	05/02/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/03/2012 10:49

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 L204307 - SW 3050B										
Blank (L204307-BLK1)				Prepared: 04/27/2012 Analyzed: 05/01/2012						
Aluminum	4.31	U	4.31	mg/kg wet						
Antimony	0.517	U	0.517	mg/kg wet						
Arsenic	0.862	U	0.862	mg/kg wet						
Barium	0.431	U	0.431	mg/kg wet						
Beryllium	0.172	U	0.172	mg/kg wet						
Boron	1.72	U	1.72	mg/kg wet						
Cadmium	0.172	U	0.172	mg/kg wet						
Calcium	86.2	U	86.2	mg/kg wet						
Chromium	0.172	U	0.172	mg/kg wet						
Cobalt	1.72	U	1.72	mg/kg wet						
Copper	0.862	U	0.862	mg/kg wet						
Iron	17.2	U	17.2	mg/kg wet						
Lead	0.431	U	0.431	mg/kg wet						
Lithium	2.16	U	2.16	mg/kg wet						
Magnesium	64.7	U	64.7	mg/kg wet						
Manganese	4.31	U	4.31	mg/kg wet						
Molybdenum	1.72	U	1.72	mg/kg wet						
Nickel	3.45	U	3.45	mg/kg wet						
Potassium	345	U	345	mg/kg wet						
Selenium	0.259	U	0.259	mg/kg wet						
Silicon	1.72	U	1.72	mg/kg wet						
Silver	0.172	U	0.172	mg/kg wet						
Sodium	43.1	U	43.1	mg/kg wet						
Uranium	17.2	U	17.2	mg/kg wet						
Vanadium	2.16	U	2.16	mg/kg wet						
Zinc	1.29	B	8.62	mg/kg wet						
Zirconium	0.236	B	4.31	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/03/2012 10:49

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 L204307 - SW 3050B										
Duplicate (L204307-DUP1)		**Source: 1204080-01**		Prepared: 04/27/2012 Analyzed: 05/01/2012						
Aluminum	6450		12.7	mg/kg dry		7360			13	20
Antimony	1.52	U	1.52	mg/kg dry		1.55 U				20
Arsenic	2.18	B	2.54	mg/kg dry		2.35			8	20
Barium	77.1		1.27	mg/kg dry		79.7			3	20
Beryllium	0.286	B	0.507	mg/kg dry		0.298			4	20
Boron	1.31	B	5.07	mg/kg dry		5.15 U				20
Cadmium	0.507	U	0.507	mg/kg dry		0.515 U				20
Calcium	5200		254	mg/kg dry		5000			4	20
Chromium	7.76		0.507	mg/kg dry		9.49			20	20
Cobalt	6.56		5.07	mg/kg dry		6.47			1	20
Copper	13.1		2.54	mg/kg dry		12.2			8	20
Iron	21900		50.7	mg/kg dry		22100			1	20
Lead	4.61		1.27	mg/kg dry		4.72			2	20
Lithium	4.79	B	6.34	mg/kg dry		7.00			37*	20
Magnesium	3920		190	mg/kg dry		4610			16	20
Manganese	306		12.7	mg/kg dry		321			5	20
Molybdenum	5.07	U	5.07	mg/kg dry		5.15 U				20
Nickel	8.25	B	10.1	mg/kg dry		9.20			11	20
Potassium	1030		1010	mg/kg dry		1390			30*	20
Selenium	0.761	U	0.761	mg/kg dry		0.773 U				20
Silicon	549		5.07	mg/kg dry		772			34*	20
Silver	0.507	U	0.507	mg/kg dry		0.515 U				20
Sodium	235		127	mg/kg dry		245			4	20
Uranium	50.7	U	50.7	mg/kg dry		51.5 U				20
Vanadium	59.8		6.34	mg/kg dry		55.3			8	20
Zinc	45.2		25.4	mg/kg dry		47.1			4	20
Zirconium	22.3		12.7	mg/kg dry		19.2			15	20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	05/03/2012 10:49

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 L204307 - SW 3050B									
Matrix Spike (L204307-MS1)		**Source: 1204080-01**	Prepared: 04/27/2012 Analyzed: 05/01/2012						
Aluminum	8380	14.2	mg/kg dry	189.90	7360	538*	75-125		20
Antimony	22.2	1.71	mg/kg dry	47.475	1.55 U	47*	75-125		20
Arsenic	179	2.85	mg/kg dry	189.90	2.35	93	75-125		20
Barium	257	1.42	mg/kg dry	189.90	79.7	93	75-125		20
Beryllium	4.67	0.570	mg/kg dry	4.7475	0.298	92	75-125		20
Boron	85.7	5.70	mg/kg dry	94.950	5.15 U	90	75-125		20
Cadmium	4.91	0.570	mg/kg dry	4.7475	0.515 U	104	75-125		20
Calcium	7680	285	mg/kg dry	2373.8	5000	113	75-125		20
Chromium	26.1	0.570	mg/kg dry	18.990	9.49	87	75-125		20
Cobalt	50.8	5.70	mg/kg dry	47.475	6.47	93	75-125		20
Copper	34.6	2.85	mg/kg dry	23.738	12.2	94	75-125		20
Iron	22100	57.0	mg/kg dry	94.950	22100	-2*	75-125		20
Lead	48.6	1.42	mg/kg dry	47.475	4.72	92	75-125		20
Lithium	95.5	7.12	mg/kg dry	94.950	7.00	93	75-125		20
Magnesium	6390	214	mg/kg dry	2373.8	4610	75	75-125		20
Manganese	361	14.2	mg/kg dry	47.475	321	84	75-125		20
Molybdenum	89.0	5.70	mg/kg dry	94.950	5.15 U	94	75-125		20
Nickel	53.6	11.4	mg/kg dry	47.475	9.20	93	75-125		20
Potassium	3480	1140	mg/kg dry	2373.8	1390	88	75-125		20
Selenium	172	0.855	mg/kg dry	189.90	0.773 U	90	75-125		20
Silicon	739	5.70	mg/kg dry	94.950	772	-34*	75-125		20
Silver	3.45	0.570	mg/kg dry	4.7475	0.515 U	73*	75-125		20
Sodium	2620	142	mg/kg dry	2373.8	245	100	75-125		20
Uranium	423	57.0	mg/kg dry	474.75	51.5 U	89	75-125		20
Vanadium	103	7.12	mg/kg dry	47.475	55.3	101	75-125		20
Zinc	90.6	28.5	mg/kg dry	47.475	47.1	92	75-125		20
Zirconium	450	14.2	mg/kg dry	474.75	19.2	91	75-125		20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/03/2012 10:49

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 L204307 - SW 3050B										
Reference (L204307-SRM1)				Prepared: 04/27/2012 Analyzed: 05/01/2012						
Aluminum	8070		12.1	mg/kg wet	6670.0		121	0-200.89		
Antimony	30.0		1.45	mg/kg wet	53.000		57	0-235.8		
Arsenic	113		2.42	mg/kg wet	114.00		99	82.8-117.54		
Barium	307		1.21	mg/kg wet	307.00		100	79.8-120.2		
Beryllium	107		0.484	mg/kg wet	108.00		99	82.8-117.6		
Boron	77.7		4.84	mg/kg wet	85.100		91	67.5-132.8		
Cadmium	225		0.484	mg/kg wet	225.00		100	83.6-116.4		
Calcium	3270		242	mg/kg wet	3360.0		97	83.3-116.9		
Chromium	80.1		0.484	mg/kg wet	77.200		104	73.3-126.4		
Cobalt	162		4.84	mg/kg wet	166.00		98	80.7-118.7		
Copper	263		2.42	mg/kg wet	271.00		97	80.8-119.2		
Iron	8410		48.4	mg/kg wet	8420.0		100	78.6-121.1		
Lead	184		1.21	mg/kg wet	190.00		97	81.6-118.4		
Lithium	117		6.05	mg/kg wet	114.00		103	50.9-148.2		
Magnesium	8330		181	mg/kg wet	8570.0		97	83.2-116.7		
Manganese	1100		12.1	mg/kg wet	965.00		114	69.3-130.5		
Molybdenum	230		4.84	mg/kg wet	235.00		98	76.2-123.8		
Nickel	218		9.68	mg/kg wet	221.00		99	79.6-120.8		
Potassium	12200		968	mg/kg wet	14400		84	81.9-118.1		
Selenium	187		0.726	mg/kg wet	187.00		100	75.9-124.6		
Silicon	345		4.84	mg/kg wet	807.00		43	0-219.3		
Silver	84.0		0.484	mg/kg wet	83.500		101	82.7-117.1		
Sodium	9240		121	mg/kg wet	9730.0		95	82.5-117.2		
Vanadium	103		6.05	mg/kg wet	98.700		104	75.9-123.6		
Zinc	197		24.2	mg/kg wet	199.00		99	78.4-121.6		
Batch L205006 - SW 7471A Prep										
Blank (L205006-BLK1)				Prepared: 05/01/2012 Analyzed: 05/02/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/03/2012 10:49

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 L205006 - SW 7471A Prep										
Duplicate (L205006-DUP1)		**Source: 1204080-01**		Prepared: 05/01/2012 Analyzed: 05/02/2012						
Mercury	0.0263	U	0.0263	mg/kg dry		0.0250 U				20
Matrix Spike (L205006-MS1)		**Source: 1204080-01**		Prepared: 05/01/2012 Analyzed: 05/02/2012						
Mercury	0.168		0.0256	mg/kg dry	0.14243	0.0250 U	118	75-125		20
Reference (L205006-SRM1)				Prepared: 05/01/2012 Analyzed: 05/02/2012						
Mercury	1.33		0.0300	mg/kg wet	1.2900		103	62.6-138		

Lionville Laboratory

Logbook #: 111

SAMPLE DIGESTION RECORD

Digestion Batch #: L204307
Date/Time Initiated: 4/27/12 0910
Date/Time Completed: 4/27/12 1500
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: 97
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
1204080 01		0.63	50		TO	mud	Brown	H_2O	N/A
L204307 -Blk		0.64	50		↓	↓	↓	↓	↓
-MS	0.5	0.57	50		↓	↓	↓	↓	↓
-DUP		0.58	50		↓	coarse	Boiling Chips		↓
-SRM		0.62	50		↓	↓	pink Fine	pink sand	↓

JJS
4/27/12

Spiking IDs / Expiration Date:
MS# : 1200457

LCS#: 1101357

Reagent IDs:
HNO_3 K41023
HCl L01031
H_2O_2 K041103
1:1 HNO_3 677-066-02
1:1 HCl

File ID#:

Data Review By/Date: 4/30/12

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

*: 6072-091-16 2 Some
1 1 12 1

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 5/1/12
Start Time/Temp: 1745 / 97°
End Time/Temp: 1815 / 96°

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

Logbook # 1094
Prep Batch: L205006
Worksheet: HG050201
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
blankR				10ml	50	
0.2 ug/l		0.100		10 ml	50	
1.0 ug/l		0.500		10 ml	50	
2.0 ug/l		1.000		10 ml	50	
5.0 ug/l		2.500		10 ml	50	
10.0 ug/l		5.000		10 ml	50	
ICV		0.125	2.5	10 ml	50	
CCV		0.250	5.0	10 ml	50	
ICB/CCB				10 ml	50	
L205006-BLK1				0.31	50	
SRM1		(*)	(*)	0.30	50	
1204080-01				0.39	50	
L205006-DUP1				0.37	50	
MS1		0.500	1.0	0.38	50	
1204086-01				0.38	50	
L205006-DUP2				0.39	50	
MS2		0.500	1.0	0.38	50	
1204086-02				0.37	50	
03				0.38	50	
04				0.35	50	
05				0.35	50	
06				0.36	50	
07				0.36	50	
08				0.38	50	
09				0.38	50	
10				0.38	50	
11				0.39	50	

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1200588	5/1/12 - 1745
ICV/CCV/LCS	IV. 1101427	↓

Reviewed By/Date: [illegible] 5/3/12

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
Water LCS Spiking Concentration: 1.0 µg/ml

A

ME-HgCVAA-Prep0910

Page #:

000000100

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 5/1/12
Start Time/Temp: See pg 094
End Time/Temp:

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

Logbook # 1094
Prep Batch: L205006
Worksheet: HG050201
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
1204086-12				0.38	50	
13				0.36	50	
14				0.36	50	
1204087-01				0.33	50	
L205006-DUP3				0.35	50	
MS3		0.500	1.0	0.35	50	
1204088-01				0.36	50	
L205006-DUP4				0.35	50	
MS4		0.500	1.0	0.37	50	
~~1204092-01~~	Sample depleted - client sending add'l wt. (?)					
~~L205006-DUP5~~						
~~MS5~~						
1204093-01				0.37	50	
L205006-DUP~~4~~ 5				0.36	50	
MS~~4~~ 5		0.500	1.0	0.37	50	
change # MW 5/1/12						

MW 5/1/12

Standard:	ID	Prep Date/Time
ICAL/MS	See pg 094	
ICV/CCV/LCS		

Reviewed By/Date: [illegible] 5/3/12

Soil LCS True Value = See pg 094 mg/Kg
Standard # _____

se book # 9368 for std traceability information
Water Matrix Spiking Solution Concentration = 0.1 µg/ml
and/or LCS Spiking Concentration: 1.0 µg/ml

ME-HgCVAA-Prep0910

Page #:

PREPARATION BENCH SHEET

L204307

Lionville Laboratory

Printed: 5/1/2012 11:45:16AM

000000102

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
1204080-01	6010B ICP Trace	04/27/2012 09:07	0.63	50					WC-Hanford, Inc.	HSL + B, Mo, Li, Si, U, Zr (no TL)
L204307-BLK1	QC	04/27/2012 09:07	0.58	50						
L204307-DUP1	QC	04/27/2012 09:07	0.64	50		1204080-01				
L204307-MS1	QC	04/27/2012 09:07	0.57	50	1200457	1204080-01	500			
L204307-SRM1	QC	04/27/2012 09:07	0.62	50	1101357		620			

JJS — 4/30/12
Extracts Relinquished By — Date

Brooter — 04/30/12
Extracts Received By — Date

INORGANICS

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 17:58

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1P118	1204080-01	Soil	04/19/2012 13:54	04/25/2012 09:45

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Case Narrative

Client: WC-HANFORD RC-228 K3877
LVL#: 1204080 **Date Received:** 04-25-12

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 that were received past hold and Sulfide that was analyzed past hold.

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

5. The method blanks were within the method criteria.

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

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

5/10/12
Date

njp\i04-080

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 12 pages.

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3877 Project Manager: Joan Kessner	**Reported:** 05/09/2012 17:58

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: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 17:58

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1P118 (1204080-01) Soil										
%Solids	**92.4**			0.1	% by Weight	1	L204291	04/26/2012	04/26/2012	SM2540G
Bromide	1.1	U	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Chloride	1.1	U	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Fluoride	1.1	U	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Nitrate	**2.9**	B	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Nitrite	1.1	U	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Orthophosphate	**2.5**	B	2.1	10.7	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Sulfate	**4.4**	B	1.1	5.3	mg/kg dry	1	L205051	05/07/2012	05/07/2012	EPA 300.0 (1993)
Nitrate/Nitrite as N	**0.77**		0.11	0.53	mg/kg dry	1	L205040	05/07/2012	05/07/2012	EPA 353.2
Cyanide	0.50	U	0.50	0.99	mg/kg dry	1	L205008	05/01/2012	05/04/2012	SW846 9014
Sulfide	43.3	U	43.3	108	mg/kg dry	1	L204311	04/30/2012	04/30/2012	SW846 9034
pH	**8.70**		0.10	0.10	pH Units	1	L204296	04/26/2012	04/26/2012	SW846 9045D
%Moisture	**7.62**		0.10	0.10	% by Weight	1	L204292	04/26/2012	04/26/2012	D2216

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 17:58

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204291 - % Solids										
Duplicate (L204291-DUP1)		**Source: 1204080-01**		Prepared & Analyzed: 04/26/2012						
%Solids	91.4		0.1	% by Weight		92.4			1	20
Batch L204292 - Default Prep GenChem										
Duplicate (L204292-DUP1)		**Source: 1204080-01**		Prepared & Analyzed: 04/26/2012						
%Moisture	8.63	0.10	0.10	% by Weight		7.62			12.5	20
Batch L204296 - Default Prep GenChem										
Duplicate (L204296-DUP1)		**Source: 1204080-01**		Prepared & Analyzed: 04/26/2012						
pH	8.65	0.10	0.10	pH Units		8.70			0.576	20
Reference (L204296-SRM1)				Prepared & Analyzed: 04/26/2012						
pH	7.02	0.10	0.10	pH Units	7.0000		100	99-101		
Batch L204311 - SW 9030B										
Blank (L204311-BLK1)				Prepared & Analyzed: 04/30/2012						
Sulfide	40.0 U	40.0	100	mg/kg wet						
LCS (L204311-BS1)				Prepared & Analyzed: 04/30/2012						
Sulfide	238	40.0	100	mg/kg wet	228.61		104	80-120		20
LCS (L204311-BS2)				Prepared & Analyzed: 04/30/2012						
Sulfide	245	40.0	100	mg/kg wet	227.51		107	80-120		20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3877	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	05/09/2012 17:58

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204311 - SW 9030B										
Duplicate (L204311-DUP1)	**Source: 1204080-01**			Prepared & Analyzed: 04/30/2012						
Sulfide	43.3 U	43.3	108	mg/kg dry		43.3 U				20
Matrix Spike (L204311-MS1)	**Source: 1204080-01**			Prepared & Analyzed: 04/30/2012						
Sulfide	235	43.3	108	mg/kg dry	241.81	43.3 U	97.2	75-125		
Batch L205008 - SW 9010B										
Blank (L205008-BLK1)				Prepared: 05/01/2012 Analyzed: 05/04/2012						
Cyanide	0.49 U	0.49	0.98	mg/kg wet						
LCS (L205008-BS1)				Prepared: 05/01/2012 Analyzed: 05/04/2012						
Cyanide	1.96	0.48	0.97	mg/kg wet	1.9331		101	80-120		
LCS (L205008-BS2)				Prepared: 05/01/2012 Analyzed: 05/04/2012						
Cyanide	7.89	0.48	0.96	mg/kg wet	9.6246		82.0	80-120		
Duplicate (L205008-DUP1)	**Source: 1204080-01**			Prepared: 05/01/2012 Analyzed: 05/04/2012						
Cyanide	0.50 U	0.50	1.01	mg/kg dry		0.50 U				20
Matrix Spike (L205008-MS1)	**Source: 1204080-01**			Prepared: 05/01/2012 Analyzed: 05/04/2012						
Cyanide	4.68	0.52	1.03	mg/kg dry	5.1515	0.50 U	90.8	75-125		
Batch L205040 - Default Prep GenChem										
Blank (L205040-BLK1)				Prepared & Analyzed: 05/07/2012						
Nitrate/Nitrite as N	0.16 B	0.10	0.50	mg/kg wet						

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Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L205040 - Default Prep GenChem										
LCS (L205040-BS1)				Prepared & Analyzed: 05/07/2012						
Nitrate/Nitrite as N	5.44	0.10	0.50	mg/kg wet	5.0000		109	90-110		20
Duplicate (L205040-DUP1)	**Source: 1204080-01**			Prepared & Analyzed: 05/07/2012						
Nitrate/Nitrite as N	0.75	0.11	0.53	mg/kg dry		0.77			2.58	20
Matrix Spike (L205040-MS1)	**Source: 1204080-01**			Prepared & Analyzed: 05/07/2012						
Nitrate/Nitrite as N	6.00	0.10	0.50	mg/kg dry	5.0159	0.77	104	75-125		
Batch L205051 - Default Prep GenChem										
Blank (L205051-BLK1)				Prepared & Analyzed: 05/07/2012						
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	1.0 U	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 (L205051-BS1)				Prepared & Analyzed: 05/07/2012						
Fluoride	50.8	1.0	5.0	mg/kg wet	50.000		102	80-120		20
Chloride	48.7	1.0	5.0	mg/kg wet	50.000		97.4	80-120		20
Bromide	47.3	1.0	5.0	mg/kg wet	50.000		94.6	80-120		20
Orthophosphate	49.7	2.0	10.0	mg/kg wet	50.000		99.4	80-120		20
Sulfate	51.6	1.0	5.0	mg/kg wet	50.000		103	80-120		20
Nitrate	47.1	1.0	5.0	mg/kg wet	50.000		94.2	80-120		20
Nitrite	47.6	1.0	5.0	mg/kg wet	50.000		95.2	80-120		20

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Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L205051 - Default Prep GenChem										
Duplicate (L205051-DUP1)	**Source: 1204080-01**			Prepared & Analyzed: 05/07/2012						
Fluoride	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Chloride	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Bromide	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Orthophosphate	2.9 B	2.1	10.7	mg/kg dry		2.5			15.7	20
Sulfate	4.1 B	1.1	5.3	mg/kg dry		4.4			7.92	20
Nitrate	2.8 B	1.1	5.3	mg/kg dry		2.9			4.10	20
Nitrite	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Matrix Spike (L205051-MS1)	**Source: 1204080-01**			Prepared & Analyzed: 05/07/2012						
Fluoride	49.7	1.0	5.0	mg/kg dry	50.159	1.1 U	99.0	75-125		20
Chloride	47.8	1.0	5.0	mg/kg dry	50.159	1.1 U	95.2	75-125		20
Bromide	47.7	1.0	5.0	mg/kg dry	50.159	1.1 U	95.0	75-125		20
Orthophosphate	52.0	2.0	10.0	mg/kg dry	50.159	2.5	98.7	75-125		20
Sulfate	54.1	1.0	5.0	mg/kg dry	50.159	4.4	99.1	75-125		20
Nitrate	49.7	1.0	5.0	mg/kg dry	50.159	2.9	93.2	75-125		20
Nitrite	46.8	1.0	5.0	mg/kg dry	50.159	1.1 U	93.4	75-125		20