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

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 5/2/12
INITIAL/DATE

COMMENTS:

SDG K3854 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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April 19, 2012

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

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-04-008-7660 SDG K3854

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 3, 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 K3854 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 April 19, 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."

4/19/12

Joseph Verville
Client Services Manager

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 K3854

SDG	7660
Contact	Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K3854

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

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

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Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	04/18/12

SDG 7660
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3854

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/18/12

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

SDG 7660
Contact Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S204008-01	J1NP18	340 Complex - Test Pits	SOIL		RC-228	RC-228-022	03/29/12 09:17
S204008-02	Lab Control Sample		SOIL		RC-228		
S204008-03	Method Blank		SOIL		RC-228		
S204008-04	Duplicate (S204008-01)	340 Complex - Test Pits	SOIL		RC-228		03/29/12 09:17

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

QC SUMMARY

SDG 7660
Contact Joseph Verville

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

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
7660	RC-228-022	J1NP18	SOIL	5.6	1842 g		04/03/12	5	S204008-01	7660-001
		Method Blank	SOIL						S204008-03	7660-003
		Lab Control Sample	SOIL						S204008-02	7660-002
		Duplicate (S204008-01)	SOIL	5.6	1842 g		04/03/12	5	S204008-04	7660-004

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

SDG 7660
Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

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	7320-130	8.0	1			1	1	1/1		
Beta Counting												
SR	SOIL	Total Strontium in Solids	7320-130	10.4	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOIL	Gamma Scan	7320-130	7.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOIL	Tritium in Solids	7320-130	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 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

SDG 7660
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S204008-01	J1NP18			7660-001	GAM		04/05/12	04/06/12	MWT	Gamma Scan
03/29/12	340 Complex - Test Pits		SOIL	7660-001	H		04/13/12	04/17/12	BW	Tritium in Solids
04/03/12	RC-228-022	RC-228		7660-001	PU		04/13/12	04/16/12	BW	Plutonium, Isotopic in Solids
				7660-001	SR		04/10/12	04/11/12	BW	Total Strontium in Solids
S204008-02	Lab Control Sample			7660-002	GAM		04/06/12	04/06/12	MWT	Gamma Scan
			SOIL	7660-002	H		04/14/12	04/17/12	BW	Tritium in Solids
		RC-228		7660-002	PU		04/13/12	04/16/12	BW	Plutonium, Isotopic in Solids
				7660-002	SR		04/10/12	04/11/12	BW	Total Strontium in Solids
S204008-03	Method Blank			7660-003	GAM		04/05/12	04/06/12	MWT	Gamma Scan
			SOIL	7660-003	H		04/13/12	04/17/12	BW	Tritium in Solids
		RC-228		7660-003	PU		04/13/12	04/16/12	BW	Plutonium, Isotopic in Solids
				7660-003	SR		04/10/12	04/11/12	BW	Total Strontium in Solids
S204008-04	Duplicate (S204008-01)			7660-004	GAM		04/05/12	04/06/12	MWT	Gamma Scan
03/29/12	340 Complex - Test Pits		SOIL	7660-004	H		04/13/12	04/17/12	BW	Tritium in Solids
04/03/12		RC-228		7660-004	PU		04/13/12	04/16/12	BW	Plutonium, Isotopic in Solids
				7660-004	SR		04/10/12	04/11/12	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 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-003 Method Blank

METHOD BLANK

SDG	7660	Client/Case no	Hanford SDG_K3854
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S204008-03	Client sample id	Method Blank
Dept sample id	7660-003	Material/Matrix	SOIL
		SAF No	RC-228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.289	1.9	3.28	10.0	U	H
Total Strontium	SR-RAD	-0.105	0.13	0.176	1.00	U	SR
Plutonium 238	13981-16-3	0.013	0.026	0.048	1.00	U	PU
Plutonium 239/240	PU-239/240	0.013	0.013	0.025	1.00	U	PU
Potassium 40	13966-00-2	U		0.112		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Niobium 94	14681-63-1	U		0.010		U	GAM
Cesium 134	13967-70-9	U		0.011		U	GAM
Cesium 137	10045-97-3	U		0.010	0.100	U	GAM
Cerium 144	14762-78-8	U		0.034		U	GAM
Europium 152	14683-23-9	U		0.022	0.100	U	GAM
Europium 154	15585-10-1	U		0.026	0.100	U	GAM
Europium 155	14391-16-3	U		0.019	0.100	U	GAM
Radium 226	13982-63-3	U		0.017	0.100	U	GAM
Radium 228	15262-20-1	U		0.030	0.200	U	GAM
Thorium 228	14274-82-9	U		0.010		U	GAM
Thorium 232	TH-232	U		0.030		U	GAM
Uranium 235	15117-96-1	U		0.041	0.300	U	GAM
Uranium 238	U-238	U		0.966	10.0	U	GAM
Americium 241	14596-10-2	U		0.021	0.300	U	GAM
Zinc 65	13982-39-3	U		0.020		U	GAM
Ruthenium 106	13967-48-1	U		0.076		U	GAM
Antimony 125	14234-35-6	U		0.018		U	GAM
Bismuth 214	14733-03-0	U		0.018		U	GAM
Lead 212	15092-94-1	U		0.011		U	GAM

QC-BLANK #81459

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7660

Contact Joseph Verville

Client/Case no Hanford SDG K3854

Contract No. S00W235A01

Lab sample id S204008-02

Dept sample id 7660-002

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	130	5.3	3.05	10.0		H	130	5.2	100	83-117	80-120
Total Strontium	8.34	0.33	0.166	1.00		SR	8.50	0.34	98	83-117	80-120
Plutonium 238	12.9	0.51	0.048	1.00		PU	13.6	0.54	95	86-114	80-120
Plutonium 239/240	15.0	0.57	0.028	1.00		PU	15.8	0.63	95	86-114	80-120
Cobalt 60	0.319	0.014	0.008	0.050		GAM	0.356	0.014	90	87-113	80-120
Cesium 137	0.366	0.013	0.010	0.100		GAM	0.401	0.016	91	88-112	80-120

QC-LCS #81458

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-004 J1NP18

DUPLICATE

SDG	7660			Client/Case no	Hanford SDG K3854
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S204008-04	Lab sample id	S204008-01	Client sample id	J1NP18
Dept sample id	7660-004	Dept sample id	7660-001	Location/Matrix	340 Complex - Test Pits SOIL
		Received	04/03/12	Collected/Weight	03/29/12 09:17 1842 g
% solids	5.6	% solids	5.6	Custody/SAF No	RC-228-022 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	-0.168	2.2	3.82	10.0	U	H	0.056	2.2	3.81	U	-		0.1
Total Strontium	-0.011	0.12	0.164	1.00	U	SR	-0.071	0.13	0.178	U	-		0.7
Plutonium 238	-0.010	0.027	0.062	1.00	U	PU	0.016	0.019	0.036	U	-		1.6
Plutonium 239/240	0.007	0.013	0.032	1.00	U	PU	0.003	0.019	0.036	U	-		0.3
Potassium 40	11.6	0.47	0.155			GAM	10.2	0.44	0.199		13	17	2.2
Cobalt 60	U		0.019	0.050	U	GAM	U		0.021	U	-		0.1
Niobium 94	U		0.016		U	GAM	U		0.016	U	-		0
Cesium 134	U		0.027		U	GAM	U		0.027	U	-		0
Cesium 137	U		0.018	0.100	U	GAM	U		0.020	U	-		0.1
Cerium 144	U		0.136		U	GAM	U		0.100	U	-		0.4
Europium 152	U		0.051	0.100	U	GAM	U		0.044	U	-		0.2
Europium 154	U		0.061	0.100	U	GAM	U		0.064	U	-		0.1
Europium 155	U		0.074	0.100	U	GAM	U		0.054	U	-		0.4
Radium 226	0.387	0.041	0.037	0.100		GAM	0.381	0.043	0.039		2	28	0.2
Radium 228	0.628	0.091	0.093	0.200		GAM	0.557	0.086	0.084		12	35	1.0
Thorium 228	0.578	0.031	0.028			GAM	0.518	0.027	0.024		11	19	1.8
Thorium 232	0.628	0.091	0.093			GAM	0.557	0.086	0.084		12	35	1.0
Uranium 235	U		0.144	0.300	U	GAM	U		0.112	U	-		0.3
Uranium 238	U		2.22	10.0	U	GAM	U		2.29	U	-		0
Americium 241	U		0.097	0.300	U	GAM	U		0.035	U	-		1.2
Zinc 65	U		0.043		U	GAM	U		0.050	U	-		0.2
Ruthenium 106	U		0.150		U	GAM	U		0.136	U	-		0.1
Antimony 125	U		0.047		U	GAM	U		0.039	U	-		0.3
Bismuth 214	0.398	0.042	0.038			GAM	0.393	0.044	0.041		1	27	0.1
Lead 212	0.596	0.032	0.029			GAM	0.534	0.028	0.025		11	19	1.8

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-004 J1NP18

DUPLICATE, cont.

SDG	7660			Client/Case no	Hanford SDG K3854
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S204008-04	Lab sample id	S204008-01	Client sample id	J1NP18
Dept sample id	7660-004	Dept sample id	7660-001	Location/Matrix	340 Complex - Test Pits SOIL
		Received	04/03/12	Collected/Weight	03/29/12 09:17 1842 g
% solids	5.6	% solids	5.6	Custody/SAF No	RC-228-022 RC-228

QC-DUP#1 81460

340 Building Geoprobe and Test-Pit Sampling

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-001 J1NP18

DATA SHEET

SDG	7660	Client/Case no	Hanford SDG K3854
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S204008-01	Client sample id	J1NP18
Dept sample id	7660-001	Location/Matrix	340 Complex - Test Pits SOIL
Received	04/03/12	Collected/Weight	03/29/12 09:17 1842 g
% solids	5.6	Custody/SAF No	RC-228-022 RC-228

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.056	2.2	3.81	10.0	U	H
Total Strontium	SR-RAD	-0.071	0.13	0.178	1.00	U	SR
Plutonium 238	13981-16-3	0.016	0.019	0.036	1.00	U	PU
Plutonium 239/240	PU-239/240	0.003	0.019	0.036	1.00	U	PU
Potassium 40	13966-00-2	10.2	0.44	0.199			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Niobium 94	14681-63-1	U		0.016		U	GAM
Cesium 134	13967-70-9	U		0.027		U	GAM
Cesium 137	10045-97-3	U		0.020	0.100	U	GAM
Cerium 144	14762-78-8	U		0.100		U	GAM
Europium 152	14683-23-9	U		0.044	0.100	U	GAM
Europium 154	15585-10-1	U		0.064	0.100	U	GAM
Europium 155	14391-16-3	U		0.054	0.100	U	GAM
Radium 226	13982-63-3	0.381	0.043	0.039	0.100		GAM
Radium 228	15262-20-1	0.557	0.086	0.084	0.200		GAM
Thorium 228	14274-82-9	0.518	0.027	0.024			GAM
Thorium 232	TH-232	0.557	0.086	0.084			GAM
Uranium 235	15117-96-1	U		0.112	0.300	U	GAM
Uranium 238	U-238	U		2.29	10.0	U	GAM
Americium 241	14596-10-2	U		0.035	0.300	U	GAM
Zinc 65	13982-39-3	U		0.050		U	GAM
Ruthenium 106	13967-48-1	U		0.136		U	GAM
Antimony 125	14234-35-6	U		0.039		U	GAM
Bismuth 214	14733-03-0	0.393	0.044	0.041			GAM
Lead 212	15092-94-1	0.534	0.028	0.025			GAM

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

7660-001 J1NP18

DATA SHEET, cont

SDG	7660	Client/Case no	Hanford	SDG K3854
Contact	Joseph Verville	Contract	No. S00W235A01	
Lab sample id	S204008-01	Client sample id	J1NP18	
Dept sample id	7660-001	Location/Matrix	340 Complex - Test Pits	SOIL
Received	04/03/12	Collected/Weight	03/29/12 09:17	1842 g
% solids	5.6	Custody/SAF No	RC-228-022	RC-228

340 Building Geoprobe and Test-Pit Sampling

Lab id	EBRLNE
Protocol	Hanford1
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Form	DVD-DS
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

Test	PU
Matrix	SOIL
SDG	7660
Contact	Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3854

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238	Plutonium 239/240
Preparation batch 7320-130						
S204008-01			7660-001	J1NP18	U	U
S204008-02			7660-002	Lab Control Sample	ok	ok
S204008-03			7660-003	Method Blank	U	U
S204008-04			7660-004	Duplicate (S204008-01)	- 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 7320-130			2σ prep error 8.0 %	Reference Lab Notebook No. 7301 pg. 61												
S204008-01			J1NP18	0.036	0.500			85		1043			15	04/13/12	04/13	SS-031
S204008-02			Lab Control Sample	0.048	0.500			87		1043				04/13/12	04/13	SS-032
S204008-03			Method Blank	0.048	0.500			82		1043				04/13/12	04/13	SS-033
S204008-04			Duplicate (S204008-01)	0.062	0.500			81		1043			15	04/13/12	04/13	SS-034
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

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

AVERAGES ± 2 SD	MDA	0.048	± 0.021
FOR 4 SAMPLES	YIELD	84	± 6

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

Test	SR
Matrix	SOIL
SDG	7660
Contact	Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3854

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7320-130					
S204008-01			7660-001	J1NP18	U
S204008-02			7660-002	Lab Control Sample	ok
S204008-03			7660-003	Method Blank	U
S204008-04			7660-004	Duplicate (S204008-01)	- 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 7320-130			2σ prep error 10.4 % Reference Lab Notebook No. 7301 pg. 61													
S204008-01			J1NP18	0.178	1.00			89		400			12	04/10/12	04/10	GRB-229
S204008-02			Lab Control Sample	0.166	1.00			90		400				04/10/12	04/10	GRB-230
S204008-03			Method Blank	0.176	1.00			92		400				04/10/12	04/10	GRB-231
S204008-04			Duplicate (S204008-01)	0.164	1.00			91		400			12	04/10/12	04/10	GRB-232
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	MDA	0.171	± 0.014
FOR 4 SAMPLES	YIELD	90	± 3

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

Test GAM Matrix SOIL
SDG 7660
Contact Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K3854

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60		Cesium 137	
Preparation batch 7320-130								
S204008-01			7660-001	J1NP18	U		U	
S204008-02			7660-002	Lab Control Sample	ok		ok	
S204008-03			7660-003	Method Blank	U		U	
S204008-04			7660-004	Duplicate (S204008-01)	-	U	-	U
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 7320-130			2σ prep error 7.0 %	Reference Lab Notebook No. 7301 pg. 61												
S204008-01			J1NP18	0.021	734					149			7	04/05/12	04/05	02,01,00
S204008-02			Lab Control Sample	0.008	733					1050				04/05/12	04/06	MB,05,00
S204008-03			Method Blank	0.010	733					149				04/05/12	04/05	01,04,00
S204008-04			Duplicate (S204008-01)	0.019	734					108			7	04/05/12	04/05	02,02,00
Nominal values and limits from method				0.050	733					100			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.014 ± 0.013
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/18/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3854

Test H Matrix SOIL
SDG 7660
Contact Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A01
Contract SDG K3854

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7320-130						
S204008-01			7660-001	J1NP18	U	
S204008-02			7660-002	Lab Control Sample	ok	
S204008-03			7660-003	Method Blank	U	
S204008-04			7660-004	Duplicate (S204008-01)	-	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 7320-130			2σ prep error 10.0 % Reference Lab Notebook No. 7301 pg. 61													
S204008-01			J1NP18	3.81	0.608			100		50			15	04/12/12	04/13	LSC-004
S204008-02			Lab Control Sample	3.05	0.607			100		50				04/12/12	04/14	LSC-004
S204008-03			Method Blank	3.28	0.607			100		50				04/12/12	04/13	LSC-004
S204008-04			Duplicate (S204008-01)	3.82	0.612			100		50			15	04/12/12	04/13	LSC-004
Nominal values and limits from method				10.0	0.607					50			180			

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

AVERAGES ± 2 SD MDA 3.49 ± 0.774
FOR 4 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/18/12

SDG 7660
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

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 04/18/12

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.

SDG 7660
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

WORK SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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Version Ver 1.0
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SDG 7660
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Case no SDG K3854

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).

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DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

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GUIDE, cont.

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Case no SDG K3854

DATA SHEET

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

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

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

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REPORT GUIDE

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Case no SDG_K3854

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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

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Protocol Hanford1
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REPORT GUIDE

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Contract No. S00W235A01
Case no SDG K3854

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

  This value reported for this limit is at most 999.

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

  1. A fixed percentage specified in the protocol.

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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 7660
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3854

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

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Protocol Hanford1
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GUIDE, cont.

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Case no SDG_K3854

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.

SDG 7660
Contact Joseph Verville

REPORT GUIDE

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Case no SDG K3854

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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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-228-022	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		
Project Designation 340 Building Geoprobe and Test-Pit Sampling	**Sampling Location** 340 Complex -- Test Pits K3854 (7660)		**SAF No.** RC-228
Ice Chest No. WCH-11-032	**Field Logbook No.** EL-1663-01	**COA** R340CX2600	**Method of Shipment** FedEx/Hand Deliver
Shipped To EBERLINE SERVICES ~~LIONVILLE~~ 3/29/12	**Offsite Property No.** ~~NA~~ AJ 3-29-12 A110313		**Bill of Lading/Air Bill No.** ~~NA~~ AJ 3-29-12 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
-Potential Radioactive ≥ DOT Limits
AJ 4-2-12

Special Handling and/or Storage
-Cool-4C NONE
AJ 3-29-12

Preservation	None	None	None	None	None	None				
Type of Container	aG	G/P	G/P	G	G/P	Snap Lid				
No. of Container(s)	1	1	1	1	1	1				
Volume	120mL	1000mL	60mL	60mL	60mL	60g				
SAMPLE ANALYSIS	TCLP Semi-VOA - 1311/8270A	See item (1) in Special Instructions.	Isotopic Plutonium	Tritium - H3 Low Level Soil	Strontium-89,90 -- Total Sr	RCF GEA Shipping Screen			RCF	32571

Sample No.	Matrix *	Sample Date	Sample Time									
J1NP18	SOIL	3/29/2012	0917		✓	✓	✓	✓				

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From MIRANDA SIMONDS	3/29/12 1520	Received By/Stored In DAVID BECKER	3/29/12 1520
Relinquished By/Removed From DAVID BECKER	3/29/12 1625	Received By/Stored In 1060#2 A. Freier	3-29-12 1625
Relinquished By/Removed From WCH A. Freier 1060#2	1325 4-2-12	Received By/Stored In Fed Ex	
Relinquished By/Removed From FEDEX		Received By/Stored In KELENSON	4/3/12 10:00
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS
~~Please Note: For the samples designated for TCLP Metals Analysis - Leach and Hold until further direction is provided.~~ 3/29/12

(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 MWShea
DATE 4/2/12

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 4/3/12 10:00 CoC No. RC-228-022

Container I.D. No. WCH-11-032 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: 4/3/12 Time: 11:40

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J1NP18	<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

11 April 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 #	1204003
SDG #	K3854
SAF #	RC-228
Date Received	04/03/12
# 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 112 pages.

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

CHAIN OF CUSTODY

Lionville Laboratory Use Only

L204003

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF#RC-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: 4-3-12 Date Due: 4-24-12

		A-D	E	F		G	H	I	J	K	L	M		N	O
Refrigerator #		F688	2	2		2	2	2	2	2	2	2		2	2
#/Type Container	Liquid														
	Solid	4AG	1AG	1AG		1AG	1AG	1AG	1AG	1AG	1AG	1A		1AG	1AG
Volume	Liquid														
	Solid	40	60	60		60	120	60	60	60	120	120		60	40
Preservatives		—	—	—		—	—	—	—	—	—	—		—	—
ANALYSES REQUESTED		ORGANIC							INORG						
		VOA	BNA	Pest/PCB	Herb	PAH's	TCLP VOA	TTPHD	Metal Hg	CN	TCLP BNA	TCLP Met	TCLP Hg	Ignitables	% Solids

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8260	8270	8082		8310 PAH	TCLV 8260	DRO	Met(1)	SFP 6010	TCLP 8270	TCLP	TCLP Hg	Anions	Ignitability	% Moisture
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	01	T1NP18	✓	✓	S	3/29/12	0917	X	X	X		X	X	X	X	X	X	X	X	X	X	X

Lionville Laboratory Use Only

Special Instructions:

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

Special Instructions:

1. Leach and hold TCLP metals until directed to.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	[signature]	4/3/12	1010

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

14 UUU 4-3-12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-228-022	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-11-030	Field Logbook No.: EL-1663-01	COA: R340CX2600	Method of Shipment: FedEx/Hand Deliver
Shipped To: ~~EBERLINE SERVICES~~ LIONVILLE 3/29/12	Offsite Property No.: ~~NA~~ AJ 3-29-12 A110283		Bill of Lading/Air Bill No.: ~~NA~~ AJ 3-29-12 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential~~ Radioactive < DOT Limits AJ 4-2-12 AJ 3-2-12

Special Handling and/or Storage

Cool 4C

Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	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 RB 3/29/12	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 RCF	TCLP VOA -- 1311/8260A 32571

Sample No.	Matrix *	Sample Date	Sample Time										
J1NP18	SOIL	3/29/2012	0917	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONDS	3/29/12 1520	DAVID BECKER	3/29/12 1520
DAVID BECKER	3/29/12 1625	A. Freier	3-29-12 1625
WCH 1060 #2 A. Freier	1305 4-2-12	Fed Ex	
Fed Ex	4-3-12 1010	VICTOR HERNANDEZ	4-3-12 1010

SPECIAL INSTRUCTIONS

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

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

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

(3) IC Anions - 300.0 {Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; NO2/NO3 - 353.2 {Nitrogen in Nitrite and Nitrate}; pH (Soil) - 9045 {pH Measurement}

* freeze upon receipt AJ 3-29-12

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

VOA samples frozen upon collection

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

REVIEWED BY Dwshea DATE 4/2/12

WCH-EE-011

00000004

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-228-022	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-11-030	**Field Logbook No.** EL-1663-01	**COA** R340CX2600	**Method of Shipment** FedEx/Hand Deliver
Shipped To ~~EBERLINE SERVICES~~ LIONVILLE 3/29/12	**Offsite Property No.** ~~NA~~ AF 3-29-12 A110283		**Bill of Lading/Air Bill No.** ~~NA~~ AF 3-29-12 See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential~~ Radioactive, DOT Limits
AF 4-2-12
AF 4-2-12

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	32571		

Sample No.	Matrix *	Sample Date	Sample Time										
J1NP18	SOIL	3/29/2012	0917	✓									

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MIRANDA SIMONS	3/29/12 1520	DAVID BECKER	3/29/12 1520
DAVID BECKER	3/29/12 1625	A. Freier	1060#2 3-29-12 1625
A. Freier 1060#2	WCH 1305 4-2-12	Fed Ex	
	4-3-12 1010	VICTOR HERNANDEZ	4-3-12 1010

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}

REVIEWED BY Mshea DATE 4/2/12

Matrix *

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

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

WCH-EE-011

000000005

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford

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

Date: 4/3/12

LvL Batch #: 1204003

Sample Custodian: [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier [signature]		Airbill # 7934087465 03
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	Comments:
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 2-1 °C		Cooler # WCH-11-030
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify)
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☑ Yes	☐ No	☐ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

000000006

VOLATILES

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

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

Analytical Report for Volatile Organic Compounds by SW846 8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

GC/MS VOLATILE

One (1) soil sample was collected on 03-29-2012.

The sample and associated QC samples were prepared and analyzed 04-03-2012 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on SW846 Method 5035A and the analysis procedure was based on SW846 Method 8260B for TCL Volatile target compounds.

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

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. Samples were analyzed within hold time.
3. Non-target compounds were not detected in these samples.
4. All 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 analysis were within acceptance criteria.

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

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

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

Iain Daniels
LvL Laboratory Manager

4/20/12
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.

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: K3854	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

J1NP18
1204003-01 (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	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,1,2,2-Tetrachloroethane	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,1,2-Trichloroethane	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,1-Dichloroethane	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,1-Dichloroethene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,2-Dichloroethane	6.13	U	6.13	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,2-Dichloroethene (total)	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
1,2-Dichloropropane	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
2-Butanone	12.3	U	12.3	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
2-Hexanone	12.3	U	12.3	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
4-Methyl-2-pentanone	12.3	U	12.3	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Acetone	12.3	U	12.3	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Benzene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Bromodichloromethane	6.13	U	6.13	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Bromoform	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Bromomethane	10.2	U	10.2	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Carbon Disulfide	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Carbon Tetrachloride	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Chlorobenzene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Chloroethane	10.2	U	10.2	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Chloroform	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Chloromethane	10.2	U	10.2	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
cis-1,2-Dichloroethene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
cis-1,3-Dichloropropene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Dibromochloromethane	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Ethylbenzene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Methylene Chloride	6.13	U	6.13	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Styrene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Tetrachloroethene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
trans-1,2-Dichloroethene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Toluene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
trans-1,3-Dichloropropene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Trichloroethene	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Vinyl chloride	10.2	U	10.2	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Xylenes, total	5.11	U	5.11	ug/kg dry	1	L204121	04/03/2012	04/03/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*96 %*		*60-130*			*L204121*	*04/03/2012*	*04/03/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

J1NP18
1204003-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Volatile Organic Compounds by SW846 8260B								
Surrogate: Toluene-d8	*88 %*	*72-117*			*L204121*	*04/03/2012*	*04/03/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*102 %*	*72-144*			*L204121*	*04/03/2012*	*04/03/2012*	*8260B*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

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 L204121 - SW 5035A										
Blank (L204121-BLK1)				Prepared & Analyzed: 04/03/2012						
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	*52.4*			*ug/kg wet*	*50.000*		*105*	*60-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/19/2012 11:36

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 L204121 - SW 5035A									
Blank (L204121-BLK1)			Prepared & Analyzed: 04/03/2012						
Surrogate: Toluene-d8	*47.8*		*ug/kg wet*	*50.000*		*96*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*53.2*		*ug/kg wet*	*50.000*		*106*	*72-144*		
LCS (L204121-BS1)			Prepared & Analyzed: 04/03/2012						
1,1,1-Trichloroethane	50.7	5.00	ug/kg wet	50.000		101	65-130		
1,1,2,2-Tetrachloroethane	45.3	5.00	ug/kg wet	50.000		91	50-130		
1,1,2-Trichloroethane	45.1	5.00	ug/kg wet	50.000		90	60-125		
1,1-Dichloroethane	48.2	5.00	ug/kg wet	50.000		96	70-130		
1,1-Dichloroethene	47.4	5.00	ug/kg wet	50.000		95	60-130		
1,2-Dichloroethane	51.5	6.00	ug/kg wet	50.000		103	60-130		
1,2-Dichloroethene (total)	93.7	5.00	ug/kg wet	100.00		94	75-125		
1,2-Dichloropropane	50.1	5.00	ug/kg wet	50.000		100	70-130		
2-Butanone	39.6	12.0	ug/kg wet	50.000		79	20-200		
2-Hexanone	45.0	12.0	ug/kg wet	50.000		90	20-200		
4-Methyl-2-pentanone	45.6	12.0	ug/kg wet	50.000		91	40-150		
Acetone	44.7	12.0	ug/kg wet	50.000		89	15-240		
Benzene	46.6	5.00	ug/kg wet	50.000		93	75-125		
Bromodichloromethane	50.4	6.00	ug/kg wet	50.000		101	65-135		
Bromoform	46.3	5.00	ug/kg wet	50.000		93	60-130		
Bromomethane	41.9	10.0	ug/kg wet	50.000		84	40-150		
Carbon Disulfide	48.4	5.00	ug/kg wet	50.000		97	55-140		
Carbon Tetrachloride	50.7	5.00	ug/kg wet	50.000		101	60-135		
Chlorobenzene	46.7	5.00	ug/kg wet	50.000		93	70-125		
Chloroethane	43.7	10.0	ug/kg wet	50.000		87	50-150		
Chloroform	50.5	5.00	ug/kg wet	50.000		101	70-130		
Chloromethane	43.7	10.0	ug/kg wet	50.000		87	40-130		
cis-1,2-Dichloroethene	46.3	5.00	ug/kg wet	50.000		93	70-125		
cis-1,3-Dichloropropene	45.7	5.00	ug/kg wet	50.000		91	70-125		
Dibromochloromethane	46.2	5.00	ug/kg wet	50.000		92	65-125		
Ethylbenzene	46.5	5.00	ug/kg wet	50.000		93	70-125		
Methylene Chloride	42.3	6.00	ug/kg wet	50.000		85	45-140		
Styrene	45.8	5.00	ug/kg wet	50.000		92	70-125		
Tetrachloroethene	47.8	5.00	ug/kg wet	50.000		96	60-130		
trans-1,2-Dichloroethene	47.4	5.00	ug/kg wet	50.000		95	65-130		
Toluene	45.2	5.00	ug/kg wet	50.000		90	70-125		
trans-1,3-Dichloropropene	47.4	5.00	ug/kg wet	50.000		95	65-125		
Trichloroethene	54.0	5.00	ug/kg wet	50.000		108	70-130		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

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 L204121 - SW 5035A									
LCS (L204121-BS1)			Prepared & Analyzed: 04/03/2012						
Vinyl chloride	41.7	10.0	ug/kg wet	50.000		83	50-150		
Xylenes, total	137	5.00	ug/kg wet	150.00		92	70-125		
Surrogate: 1,2-Dichloroethane-d4	*52.6*		*ug/kg wet*	*50.000*		*105*	*60-130*		
Surrogate: Toluene-d8	*48.1*		*ug/kg wet*	*50.000*		*96*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*50.9*		*ug/kg wet*	*50.000*		*102*	*72-144*		
Matrix Spike (L204121-MS1)		**Source: 1204003-01**	Prepared & Analyzed: 04/03/2012						
1,1,1-Trichloroethane	57.1	5.16	ug/kg dry	51.644	5.11 U	111	65-130		
1,1,2,2-Tetrachloroethane	43.2	5.16	ug/kg dry	51.644	5.11 U	84	50-130		
1,1,2-Trichloroethane	45.2	5.16	ug/kg dry	51.644	5.11 U	88	60-125		
1,1-Dichloroethane	51.2	5.16	ug/kg dry	51.644	5.11 U	99	70-130		
1,1-Dichloroethene	49.4	5.16	ug/kg dry	51.644	5.11 U	96	60-130		
1,2-Dichloroethane	57.6	6.20	ug/kg dry	51.644	6.13 U	111	60-130		
1,2-Dichloroethene (total)	96.8	5.16	ug/kg dry	103.29	5.11 U	94	75-125		
1,2-Dichloropropane	52.3	5.16	ug/kg dry	51.644	5.11 U	101	70-130		
2-Butanone	36.0	12.4	ug/kg dry	51.644	12.3 U	70	20-200		
2-Hexanone	41.9	12.4	ug/kg dry	51.644	12.3 U	81	20-200		
4-Methyl-2-pentanone	44.0	12.4	ug/kg dry	51.644	12.3 U	85	40-150		
Acetone	46.5	12.4	ug/kg dry	51.644	12.3 U	90	15-240		
Benzene	48.4	5.16	ug/kg dry	51.644	5.11 U	94	75-125		
Bromodichloromethane	55.3	6.20	ug/kg dry	51.644	6.13 U	107	65-135		
Bromoform	47.8	5.16	ug/kg dry	51.644	5.11 U	93	60-130		
Bromomethane	50.4	10.3	ug/kg dry	51.644	10.2 U	98	40-150		
Carbon Disulfide	51.7	5.16	ug/kg dry	51.644	5.11 U	100	55-140		
Carbon Tetrachloride	58.6	5.16	ug/kg dry	51.644	5.11 U	113	60-135		
Chlorobenzene	47.2	5.16	ug/kg dry	51.644	5.11 U	91	70-125		
Chloroethane	49.3	10.3	ug/kg dry	51.644	10.2 U	95	50-150		
Chloroform	55.0	5.16	ug/kg dry	51.644	5.11 U	107	70-130		
Chloromethane	45.0	10.3	ug/kg dry	51.644	10.2 U	87	40-130		
cis-1,2-Dichloroethene	47.8	5.16	ug/kg dry	51.644	5.11 U	93	70-125		
cis-1,3-Dichloropropene	47.3	5.16	ug/kg dry	51.644	5.11 U	92	70-125		
Dibromochloromethane	50.0	5.16	ug/kg dry	51.644	5.11 U	97	65-125		
Ethylbenzene	46.7	5.16	ug/kg dry	51.644	5.11 U	91	70-125		
Methylene Chloride	43.5	6.20	ug/kg dry	51.644	6.13 U	84	45-140		
Styrene	46.8	5.16	ug/kg dry	51.644	5.11 U	91	70-125		
Tetrachloroethene	50.5	5.16	ug/kg dry	51.644	5.11 U	98	60-130		
trans-1,2-Dichloroethene	48.9	5.16	ug/kg dry	51.644	5.11 U	95	65-130		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

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 L204121 - SW 5035A									
Matrix Spike (L204121-MS1)	**Source: 1204003-01**		Prepared & Analyzed: 04/03/2012						
Toluene	45.7	5.16	ug/kg dry	51.644	5.11 U	88	70-125		
trans-1,3-Dichloropropene	48.8	5.16	ug/kg dry	51.644	5.11 U	94	65-125		
Trichloroethene	57.8	5.16	ug/kg dry	51.644	5.11 U	112	70-130		
Vinyl chloride	44.7	10.3	ug/kg dry	51.644	10.2 U	87	50-150		
Xylenes, total	142	5.16	ug/kg dry	154.93	5.11 U	92	70-125		
Surrogate: 1,2-Dichloroethane-d4	*53.2*		*ug/kg dry*	*51.644*		*103*	*60-130*		
Surrogate: Toluene-d8	*45.3*		*ug/kg dry*	*51.644*		*88*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*50.5*		*ug/kg dry*	*51.644*		*98*	*72-144*		
Matrix Spike Dup (L204121-MSD1)	**Source: 1204003-01**		Prepared & Analyzed: 04/03/2012						
1,1,1-Trichloroethane	50.4	4.43	ug/kg dry	44.350	5.11 U	114	65-130	3	20
1,1,2,2-Tetrachloroethane	36.0	4.43	ug/kg dry	44.350	5.11 U	81	50-130	3	20
1,1,2-Trichloroethane	39.0	4.43	ug/kg dry	44.350	5.11 U	88	60-125	0.4	20
1,1-Dichloroethane	44.0	4.43	ug/kg dry	44.350	5.11 U	99	70-130	0.02	20
1,1-Dichloroethene	44.0	4.43	ug/kg dry	44.350	5.11 U	99	60-130	4	20
1,2-Dichloroethane	49.1	5.32	ug/kg dry	44.350	6.13 U	111	60-130	0.6	20
1,2-Dichloroethene (total)	84.5	4.43	ug/kg dry	88.700	5.11 U	95	75-125	2	20
1,2-Dichloropropane	44.1	4.43	ug/kg dry	44.350	5.11 U	99	70-130	2	20
2-Butanone	36.4	10.6	ug/kg dry	44.350	12.3 U	82	20-200	16	20
2-Hexanone	36.8	10.6	ug/kg dry	44.350	12.3 U	83	20-200	2	20
4-Methyl-2-pentanone	38.4	10.6	ug/kg dry	44.350	12.3 U	87	40-150	2	20
Acetone	29.6	10.6	ug/kg dry	44.350	12.3 U	67	15-240	30*	20
Benzene	40.7	4.43	ug/kg dry	44.350	5.11 U	92	75-125	2	20
Bromodichloromethane	47.9	5.32	ug/kg dry	44.350	6.13 U	108	65-135	0.9	20
Bromoform	42.1	4.43	ug/kg dry	44.350	5.11 U	95	60-130	3	20
Bromomethane	41.7	8.87	ug/kg dry	44.350	10.2 U	94	40-150	4	20
Carbon Disulfide	45.0	4.43	ug/kg dry	44.350	5.11 U	101	55-140	1	20
Carbon Tetrachloride	50.9	4.43	ug/kg dry	44.350	5.11 U	115	60-135	1	20
Chlorobenzene	40.9	4.43	ug/kg dry	44.350	5.11 U	92	70-125	0.9	20
Chloroethane	42.4	8.87	ug/kg dry	44.350	10.2 U	96	50-150	0.3	20
Chloroform	47.5	4.43	ug/kg dry	44.350	5.11 U	107	70-130	0.5	20
Chloromethane	40.8	8.87	ug/kg dry	44.350	10.2 U	92	40-130	5	20
cis-1,2-Dichloroethene	40.8	4.43	ug/kg dry	44.350	5.11 U	92	70-125	0.7	20
cis-1,3-Dichloropropene	40.4	4.43	ug/kg dry	44.350	5.11 U	91	70-125	0.6	20
Dibromochloromethane	42.3	4.43	ug/kg dry	44.350	5.11 U	95	65-125	2	20
Ethylbenzene	40.5	4.43	ug/kg dry	44.350	5.11 U	91	70-125	0.9	20
Methylene Chloride	38.0	5.32	ug/kg dry	44.350	6.13 U	86	45-140	2	20

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:36

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 L204121 - SW 5035A									
Matrix Spike Dup (L204121-MSD1)	**Source: 1204003-01**		Prepared & Analyzed: 04/03/2012						
Styrene	40.6	4.43	ug/kg dry	44.350	5.11 U	92	70-125	1	20
Tetrachloroethene	44.2	4.43	ug/kg dry	44.350	5.11 U	100	60-130	2	20
trans-1,2-Dichloroethene	43.7	4.43	ug/kg dry	44.350	5.11 U	99	65-130	4	20
Toluene	39.5	4.43	ug/kg dry	44.350	5.11 U	89	70-125	0.7	20
trans-1,3-Dichloropropene	42.0	4.43	ug/kg dry	44.350	5.11 U	95	65-125	0.3	20
Trichloroethene	48.8	4.43	ug/kg dry	44.350	5.11 U	110	70-130	2	20
Vinyl chloride	38.9	8.87	ug/kg dry	44.350	10.2 U	88	50-150	1	20
Xylenes, total	122	4.43	ug/kg dry	133.05	5.11 U	92	70-125	0.2	20
Surrogate: 1,2-Dichloroethane-d4	*45.8*		*ug/kg dry*	*44.350*		*103*	*60-130*		
Surrogate: Toluene-d8	*38.3*		*ug/kg dry*	*44.350*		*86*	*72-117*		
Surrogate: 4-Bromofluorobenzene	*42.2*		*ug/kg dry*	*44.350*		*95*	*72-144*		

PREPARATION BENCH SHEET

L204121

Lionville Laboratory

Printed: 4/11/2012 1:14:26PM

000000021

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
1204003-01	8260B TCL VOC	04/03/2012 14:11	5.35	5				5	WC-Hanford, Inc.	
L204121-BLK1	QC	04/03/2012 13:25	5	5				5		
L204121-BS1	QC	04/03/2012 12:50	5	5	1200136		5	5		
L204121-MS1	QC	04/03/2012 14:45	5.29	5	1200136	1204003-01	5	5		
L204121-MSD1	QC	04/03/2012 15:20	6.16	5	1200136	1204003-01	5	5		

B 4/11/12

Extracts Relinquished By Date

MA Ray 4/19/12

Extracts Received By Date

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:57

Analytical Report for TCLP Volatiles by SW846 1311/8260B

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

GC/MS VOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 03-29-2012.

The sample and associated QC samples were leached 04-04-2012 and analyzed 04-05-2012 according to criteria set forth in Lionville Laboratory SOPs. The leaching procedure was based on SW846 Method 1311 and the analysis procedure was based on SW846 Method 8260B.

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

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

2. The samples were analyzed within hold time.

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

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."

Iain Daniels
Laboratory Manager
Lionville Laboratory

4/19/12
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.

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/19/2012 11:57

J1NP18
1204003-01 (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	L204075	04/05/2012	04/05/2012	8260B
1,1-Dichloroethene	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
2-Butanone	0.05	U	0.05	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Chloroform	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Carbon Tetrachloride	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Benzene	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
1,2-Dichloroethane	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Trichloroethene	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Tetrachloroethene	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Chlorobenzene	0.02	U	0.02	mg/L	5	L204075	04/05/2012	04/05/2012	8260B
Surrogate: 1,2-Dichloroethane-d4	*106 %*		*60-140*			*L204075*	*04/05/2012*	*04/05/2012*	*8260B*
Surrogate: Toluene-d8	*88 %*		*65-120*			*L204075*	*04/05/2012*	*04/05/2012*	*8260B*
Surrogate: 4-Bromofluorobenzene	*104 %*		*75-130*			*L204075*	*04/05/2012*	*04/05/2012*	*8260B*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/19/2012 11:57

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 L204075 - SW 5030B										
Blank (L204075-BLK1)				Prepared & Analyzed: 04/05/2012						
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	*0.0508*			*mg/L*	*0.050000*		*102*	*60-140*		
Surrogate: Toluene-d8	*0.0442*			*mg/L*	*0.050000*		*88*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0526*			*mg/L*	*0.050000*		*105*	*75-130*		
Blank (L204075-BLK2)				Prepared & Analyzed: 04/05/2012						
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	*0.257*			*mg/L*	*0.25000*		*103*	*60-140*		
Surrogate: Toluene-d8	*0.222*			*mg/L*	*0.25000*		*89*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.272*			*mg/L*	*0.25000*		*109*	*75-130*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/19/2012 11:57

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 L204075 - SW 5030B										
LCS (L204075-BS1)				Prepared & Analyzed: 04/05/2012						
Vinyl chloride	0.05		0.01	mg/L	0.050000		93	55-135		20
1,1-Dichloroethene	0.05		0.005	mg/L	0.050000		107	65-140		20
2-Butanone	0.06		0.01	mg/L	0.050000		113	20-200		20
Chloroform	0.05		0.005	mg/L	0.050000		105	75-125		20
Carbon Tetrachloride	0.05		0.005	mg/L	0.050000		96	65-130		20
Benzene	0.05		0.005	mg/L	0.050000		103	75-125		20
1,2-Dichloroethane	0.05		0.005	mg/L	0.050000		100	60-140		20
Trichloroethene	0.05		0.005	mg/L	0.050000		101	75-125		20
Tetrachloroethene	0.05		0.005	mg/L	0.050000		93	70-130		20
Chlorobenzene	0.05		0.005	mg/L	0.050000		101	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.0497*			*mg/L*	*0.050000*		*99*	*60-140*		
Surrogate: Toluene-d8	*0.0458*			*mg/L*	*0.050000*		*92*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.0548*			*mg/L*	*0.050000*		*110*	*75-130*		
Matrix Spike (L204075-MS1)		**Source: 1204003-01**		Prepared & Analyzed: 04/05/2012						
Vinyl chloride	0.22	D	0.05	mg/L	0.25000	0.05 U	87	55-135		20
1,1-Dichloroethene	0.27	D	0.02	mg/L	0.25000	0.02 U	108	65-140		20
2-Butanone	0.29	D	0.05	mg/L	0.25000	0.05 U	116	20-200		20
Chloroform	0.27	D	0.02	mg/L	0.25000	0.02 U	107	75-125		20
Carbon Tetrachloride	0.24	D	0.02	mg/L	0.25000	0.02 U	98	65-130		20
Benzene	0.26	D	0.02	mg/L	0.25000	0.02 U	105	75-125		20
1,2-Dichloroethane	0.26	D	0.02	mg/L	0.25000	0.02 U	106	60-140		20
Trichloroethene	0.25	D	0.02	mg/L	0.25000	0.02 U	101	75-125		20
Tetrachloroethene	0.22	D	0.02	mg/L	0.25000	0.02 U	90	70-130		20
Chlorobenzene	0.25	D	0.02	mg/L	0.25000	0.02 U	101	75-125		20
Surrogate: 1,2-Dichloroethane-d4	*0.267*			*mg/L*	*0.25000*		*107*	*60-140*		
Surrogate: Toluene-d8	*0.229*			*mg/L*	*0.25000*		*92*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.280*			*mg/L*	*0.25000*		*112*	*75-130*		

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/19/2012 11:57

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 L204075 - SW 5030B										
Matrix Spike Dup (L204075-MSD1)		**Source: 1204003-01**		Prepared & Analyzed: 04/05/2012						
Vinyl chloride	0.23	D	0.05	mg/L	0.25000	0.05 U	91	55-135	5	20
1,1-Dichloroethene	0.27	D	0.02	mg/L	0.25000	0.02 U	110	65-140	2	20
2-Butanone	0.30	D	0.05	mg/L	0.25000	0.05 U	121	20-200	4	20
Chloroform	0.27	D	0.02	mg/L	0.25000	0.02 U	110	75-125	2	20
Carbon Tetrachloride	0.26	D	0.02	mg/L	0.25000	0.02 U	103	65-130	5	20
Benzene	0.27	D	0.02	mg/L	0.25000	0.02 U	109	75-125	4	20
1,2-Dichloroethane	0.27	D	0.02	mg/L	0.25000	0.02 U	110	60-140	4	20
Trichloroethene	0.26	D	0.02	mg/L	0.25000	0.02 U	104	75-125	3	20
Tetrachloroethene	0.24	D	0.02	mg/L	0.25000	0.02 U	96	70-130	7	20
Chlorobenzene	0.26	D	0.02	mg/L	0.25000	0.02 U	105	75-125	4	20
Surrogate: 1,2-Dichloroethane-d4	*0.269*			*mg/L*	*0.25000*		*108*	*60-140*		
Surrogate: Toluene-d8	*0.234*			*mg/L*	*0.25000*		*94*	*65-120*		
Surrogate: 4-Bromofluorobenzene	*0.278*			*mg/L*	*0.25000*		*111*	*75-130*		

Lionville Laboratory Incorporated

TCLP EXTRACTION RECORD (VOLATILES)

Logbook # 1101

Start Date: 4-4-12 Start Time: 12:36 Analyst: RH SOP: SPI-1311.2 Rev. 01C pH of Extraction Fluid:	End Date: 4-5-12 End Time: 6:30 Analyst: RH	Tumbler Speed: 30 RPM Leachate Batch #: L204029 Leachate Page: 1 of 1 Room Temp.(°C) 21 / 21 (start/finish)

COC # 1204003-01 Client ID# JINP18 ZHE #: N/A 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 # L204029 Client ID# N/A ZHE #: N/A Sample Wt.(g): 10 Extract Fluid Vol.(mL): 200	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: Blank ZHE Still Pressurized after Extraction(circle) (Y) N
COC # ____ Client ID# ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID# ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N
COC # ____ Client ID#: ____ ZHE #: ____ Sample Wt.(g): ____ Extract Fluid Vol.(mL): ____	Initial Filtration Data and Comments: Solids: ____% / NA 4-4-12 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 RH Initial Filtrate Added: ____ ZHE Still Pressurized after Extraction(circle) Y N

Comments:

Reviewed By/Date: RGC 4/19/12

PREPARATION BENCH SHEET

L204075

Lionville Laboratory

Printed: 4/11/2012 12:46:37PM

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
1204003-01	1311/8260B TCLV ZHE VOA	04/05/2012 13:07	5	5				25	WC-Hanford, Inc.	DIL 5X
L204075-BLK1	QC	04/05/2012 11:46	5	5				5		
L204075-BLK2	QC	04/05/2012 12:34	5	5				25		DIL 5X LB L204029
L204075-BS1	QC	04/05/2012 11:12	5	5	1200136		5	5		
L204075-MS1	QC	04/05/2012 13:40	5	5	1200136	1204003-01	25	25		DIL 5X
L204075-MSD1	QC	04/05/2012 14:14	5	5	1200136	1204003-01	25	25		DIL 5X

TB 4/11/12

Extracts Relinquished By Date

NA 4/19/12

Extracts Received By Date

SEMIVOLATILES

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Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/18/2012 16:25

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

SEMIVOLATILE

One (1) soil sample was collected on 03-29-2012.

The sample and associated QC samples were extracted 04-03-2012 and analyzed 04-04,05,09-2012 according to Lionville Laboratory SOPs. The extraction procedure was based on SW846 Method 3540C, and the analysis procedure was based on SW846 Method 8270C for TCL Semivolatile target compounds.

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

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

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

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

4. The sample J1NP18 and L204023-MS2/MSD2 required a 2-fold dilution due to the matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

5. All obtainable surrogate recoveries were within acceptance criteria.

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

7. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS087) has been enclosed.

8. Eleven (11) of one hundred and twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS087) has been enclosed.

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

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

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

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

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

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

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

Iain Daniels
LvL Laboratory Manager

4/19/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12MS087

Initiator: Shawn Taylor
Date: 4-18-12
Client: WCHanford RC-228 K3F54

Batch: 1204003
Samples: L204023-MS1, MS2, MSD2
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: SOLID
Prep Batch: L204023

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

(1) low recovery of 2,4-dinitrophenol in L204023-MS1
(2) low recovery of hexachlorocyclopentadiene in L204023-MS2
(3) ~~high recovery of hexachlorocyclopentadiene~~ & low recovery of 4-nitroaniline, n-nitrosodiphenylamine, phenanthrene, anthracene, di-n-butylphthalate, pyrene, butylbenzylphthalate, di-n-octylphthalate, benzo(k)fluoranthene, benzo(a)pyrene in L204023-MS2 MSD2 Rcvd 4/18/12

2. Known or Probable Causes(s) (1) Acidic phenols subject to erratic chromatographic behavior (2) & (3) possible matrix effect samples required a 2 fold dilution for analysis

3. Discussion and Proposed Action Other Description:

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

namk

Associated samples nondetect for target compounds minimal impact on the data

Rcvd 4/18/12

4. Project Manager Instructions...signature/date: _____ 4/18/12

__ 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: _____ 4/19/12 Other Explanation:

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

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

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

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

QA-139-A-0208

GLOSSARY

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concetration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

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

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	04/18/2012 16:25

J1NP18
1204003-01 (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	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
1,2-Dichlorobenzene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
1,3-Dichlorobenzene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
1,4-Dichlorobenzene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4,5-Trichlorophenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4,6-Trichlorophenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4-Dichlorophenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4-Dimethylphenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4-Dinitrophenol	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,4-Dinitrotoluene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2,6-Dinitrotoluene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Chloronaphthalene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Chlorophenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Methylnaphthalene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Methylphenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Nitroaniline	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
2-Nitrophenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
3,3'-Dichlorobenzidine	1410	U	1410	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
3-Nitroaniline	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4,6-Dinitro-2-methylphenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Bromophenyl Phenyl Ether	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Chloro-3-methylphenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Chloroaniline	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Chlorophenyl Phenyl Ether	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
3- and/or 4-Methylphenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Nitroaniline	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
4-Nitrophenol	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Acenaphthene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Acenaphthylene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Anthracene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Benz[a]anthracene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Benzo[a] pyrene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Benzo[b] fluoranthene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Benzo[g,h,i] perylene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Benzo[k] fluoranthene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Bis(2-chloroethoxy) methane	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/18/2012 16:25

J1NP18
1204003-01 (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	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Bis(2-chloroisopropyl) ether	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Bis(2-ethylhexyl) phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Butyl Benzyl Phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Carbazole	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Chrysene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Dibenz[a,h]anthracene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Dibenzofuran	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Diethyl Phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Dimethyl Phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Di-n-butyl Phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Di-n-octyl Phthalate	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Fluoranthene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Fluorene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Hexachlorobenzene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Hexachlorobutadiene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Hexachlorocyclopentadiene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Hexachloroethane	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Indeno[1,2,3-cd]pyrene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Isophorone	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Naphthalene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Nitrobenzene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
N-Nitrosodi-n-propylamine	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
N-Nitrosodiphenylamine	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Pentachlorophenol	3530	U	3530	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Phenanthrene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Phenol	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Pyrene	707	U	707	ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
TIC:Aldol Condensate 1	**14000**	A, B, D, J		ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
TIC:Aldol Condensate 2	**354**	A, D, J		ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
TIC:Aldol Condensate 3	**3050**	A, B, D, J		ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
TIC:Trichloro-1-propene	**1250**	B, J, D		ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
TIC:Unknown 1	**1160**	J, D		ug/kg dry	2	L204023	04/03/2012	04/05/2012	8270C
Surrogate: 2-Fluorophenol	*57 %*		*25-121*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*
Surrogate: Phenol-d5	*64 %*		*24-113*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*56 %*		*23-120*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/18/2012 16:25

J1NP18
1204003-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*62 %*	*30-115*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*33 %*	*19-122*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*74 %*	*18-137*			*L204023*	*04/03/2012*	*04/05/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/18/2012 16:25

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 L204023 - SW 3540C										
Blank (L204023-BLK1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
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: K3854 Project Manager: Joan Kessner	**Reported:** 04/18/2012 16:25

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 L204023 - SW 3540C										
Blank (L204023-BLK1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
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						
Trichloro-1-propene TICS	255	J		ug/kg wet						
Aldol Condensate 4	740	A, J		ug/kg wet						
Aldol Condensate 3 RGC 4/18/12	11300	A, J		ug/kg wet						
Aldol Condensate 2	281	A, J		ug/kg wet						
Aldol Condensate 1	241	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1380*			*ug/kg wet*	*2500.0*		*55*	*25-121*		
Surrogate: Phenol-d5	*1510*			*ug/kg wet*	*2500.0*		*60*	*24-113*		
Surrogate: Nitrobenzene-d5	*927*			*ug/kg wet*	*1666.7*		*56*	*23-120*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/18/2012 16:25

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 L204023 - SW 3540C										
Blank (L204023-BLK1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
Surrogate: 2-Fluorobiphenyl	*1050*			*ug/kg wet*	*1666.7*		*63*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*999*			*ug/kg wet*	*2500.0*		*40*	*19-122*		
Surrogate: p-Terphenyl-d14	*1180*			*ug/kg wet*	*1666.7*		*71*	*18-137*		
LCS (L204023-BS1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
1,2,4-Trichlorobenzene	1210		330	ug/kg wet	2000.0		60	45-110		
1,2-Dichlorobenzene	1190		330	ug/kg wet	2000.0		59	45-105		
1,3-Dichlorobenzene	1130		330	ug/kg wet	2000.0		57	40-100		
1,4-Dichlorobenzene	1160		330	ug/kg wet	2000.0		58	35-105		
2,4,5-Trichlorophenol	1290		330	ug/kg wet	2000.0		64	30-140		
2,4,6-Trichlorophenol	971		330	ug/kg wet	2000.0		49	20-110		
2,4-Dichlorophenol	1330		330	ug/kg wet	2000.0		67	40-110		
2,4-Dimethylphenol	1020		330	ug/kg wet	2000.0		51	30-105		
2,4-Dinitrophenol	291	J	1650	ug/kg wet	2000.0		15*	25-130		
2,4-Dinitrotoluene	1410		330	ug/kg wet	2000.0		70	50-115		
2,6-Dinitrotoluene	1360		330	ug/kg wet	2000.0		68	40-120		
2-Chloronaphthalene	1260		330	ug/kg wet	2000.0		63	45-115		
2-Chlorophenol	1260		330	ug/kg wet	2000.0		63	45-105		
2-Methylnaphthalene	1340		330	ug/kg wet	2000.0		67	45-110		
2-Methylphenol	1250		330	ug/kg wet	2000.0		62	40-120		
2-Nitroaniline	1360	J	1650	ug/kg wet	2000.0		68	45-120		
2-Nitrophenol	1330		330	ug/kg wet	2000.0		66	40-110		
3,3'-Dichlorobenzidine	1150		660	ug/kg wet	2000.0		58	15-130		
3-Nitroaniline	1520	J	1650	ug/kg wet	2000.0		76	40-130		
4,6-Dinitro-2-methylphenol	625		330	ug/kg wet	2000.0		31	20-140		
4-Bromophenyl Phenyl Ether	1330		330	ug/kg wet	2000.0		67	45-115		
4-Chloro-3-methylphenol	1380		330	ug/kg wet	2000.0		69	35-115		
4-Chloroaniline	1020		330	ug/kg wet	2000.0		51	10-100		
4-Chlorophenyl Phenyl Ether	1330		330	ug/kg wet	2000.0		67	45-110		
3- and/or 4-Methylphenol	1310		330	ug/kg wet	2000.0		65	40-120		
4-Nitroaniline	1370	J	1650	ug/kg wet	2000.0		69	40-130		
4-Nitrophenol	1260	J	1650	ug/kg wet	2000.0		63	15-140		
Acenaphthene	1260		330	ug/kg wet	2000.0		63	45-110		
Acenaphthylene	1040		330	ug/kg wet	2000.0		52	45-115		
Anthracene	1250		330	ug/kg wet	2000.0		63	45-130		
Benz[a]anthracene	1380		330	ug/kg wet	2000.0		69	45-130		
Benzo[a] pyrene	1290		330	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: K3854 Project Manager: Joan Kessner	**Reported:** 04/18/2012 16:25

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 L204023 - SW 3540C										
LCS (L204023-BS1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
Benzo[b] fluoranthene	1430		330	ug/kg wet	2000.0		71	40-130		
Benzo[g,h,i] perylene	1450		330	ug/kg wet	2000.0		73	45-125		
Benzo[k] fluoranthene	1390		330	ug/kg wet	2000.0		70	45-125		
Bis(2-chloroethoxy) methane	1250		330	ug/kg wet	2000.0		63	45-110		
Bis(2-chloroethyl) ether	1140		330	ug/kg wet	2000.0		57	40-110		
Bis(2-chloroisopropyl) ether	1180		330	ug/kg wet	2000.0		59	30-115		
Bis(2-ethylhexyl) phthalate	1380		330	ug/kg wet	2000.0		69	40-145		
Butyl Benzyl Phthalate	1340		330	ug/kg wet	2000.0		67	50-125		
Carbazole	1600		330	ug/kg wet	2000.0		80	40-140		
Chrysene	1450		330	ug/kg wet	2000.0		73	45-130		
Dibenz[a,h]anthracene	1250		330	ug/kg wet	2000.0		62	45-125		
Dibenzofuran	1330		330	ug/kg wet	2000.0		67	45-120		
Diethyl Phthalate	1340		330	ug/kg wet	2000.0		67	50-125		
Dimethyl Phthalate	1300		330	ug/kg wet	2000.0		65	45-130		
Di-n-butyl Phthalate	1250		330	ug/kg wet	2000.0		63	50-130		
Di-n-octyl Phthalate	1350		330	ug/kg wet	2000.0		68	40-150		
Fluoranthene	1380		330	ug/kg wet	2000.0		69	45-130		
Fluorene	1330		330	ug/kg wet	2000.0		67	45-120		
Hexachlorobenzene	1390		330	ug/kg wet	2000.0		69	45-130		
Hexachlorobutadiene	1390		330	ug/kg wet	2000.0		69	45-105		
Hexachlorocyclopentadiene	222	J	330	ug/kg wet	2000.0		11	10-100		
Hexachloroethane	1100		330	ug/kg wet	2000.0		55	35-110		
Indeno[1,2,3-cd]pyrene	1380		330	ug/kg wet	2000.0		69	45-130		
Isophorone	1180		330	ug/kg wet	2000.0		59	40-110		
Naphthalene	1390		330	ug/kg wet	2000.0		69	40-110		
Nitrobenzene	1180		330	ug/kg wet	2000.0		59	40-105		
N-Nitrosodi-n-propylamine	1220		330	ug/kg wet	2000.0		61	30-130		
N-Nitrosodiphenylamine	1260		330	ug/kg wet	2000.0		63	50-120		
Pentachlorophenol	696	J	1650	ug/kg wet	2000.0		35	25-120		
Phenanthrene	1350		330	ug/kg wet	2000.0		67	50-120		
Phenol	1280		330	ug/kg wet	2000.0		64	40-115		
Pyrene	1310		330	ug/kg wet	2000.0		65	45-125		
Surrogate: 2-Fluorophenol	*1640*			*ug/kg wet*	*2500.0*		*65*	*25-121*		
Surrogate: Phenol-d5	*1710*			*ug/kg wet*	*2500.0*		*69*	*24-113*		
Surrogate: Nitrobenzene-d5	*1130*			*ug/kg wet*	*1666.7*		*68*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1160*			*ug/kg wet*	*1666.7*		*70*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1050*			*ug/kg wet*	*2500.0*		*42*	*19-122*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	Reported: 04/18/2012 16:25

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 L204023 - SW 3540C										
LCS (L204023-BS1)				Prepared: 04/03/2012 Analyzed: 04/04/2012						
Surrogate: p-Terphenyl-d14	*1260*			*ug/kg wet*	*1666.7*		*76*	*18-137*		
Matrix Spike (L204023-MS2)		**Source: 1204003-01**		Prepared: 04/03/2012 Analyzed: 04/05/2012						
1,2,4-Trichlorobenzene	1150	D	729	ug/kg dry	2208.4	707 U	52	45-110		
1,2-Dichlorobenzene	1250	D	729	ug/kg dry	2208.4	707 U	57	45-105		
1,3-Dichlorobenzene	1180	D	729	ug/kg dry	2208.4	707 U	54	40-100		
1,4-Dichlorobenzene	1210	D	729	ug/kg dry	2208.4	707 U	55	35-105		
2,4,5-Trichlorophenol	1410	D	729	ug/kg dry	2208.4	707 U	64	30-140		
2,4,6-Trichlorophenol	1030	D	729	ug/kg dry	2208.4	707 U	47	20-110		
2,4-Dichlorophenol	1280	D	729	ug/kg dry	2208.4	707 U	58	40-110		
2,4-Dimethylphenol	1080	D	729	ug/kg dry	2208.4	707 U	49	30-105		
2,4-Dinitrophenol	1570	J, D	3640	ug/kg dry	2208.4	3530 U	71	25-130		
2,4-Dinitrotoluene	1480	D	729	ug/kg dry	2208.4	707 U	67	50-115		
2,6-Dinitrotoluene	1400	D	729	ug/kg dry	2208.4	707 U	63	40-120		
2-Chloronaphthalene	1220	D	729	ug/kg dry	2208.4	707 U	55	45-115		
2-Chlorophenol	1240	D	729	ug/kg dry	2208.4	707 U	56	45-105		
2-Methylnaphthalene	1340	D	729	ug/kg dry	2208.4	707 U	61	45-110		
2-Methylphenol	1440	D	729	ug/kg dry	2208.4	707 U	65	40-120		
2-Nitroaniline	1360	J, D	3640	ug/kg dry	2208.4	3530 U	62	45-120		
2-Nitrophenol	1230	D	729	ug/kg dry	2208.4	707 U	56	40-110		
3,3'-Dichlorobenzidine	760	J, D	1460	ug/kg dry	2208.4	1410 U	34	15-130		
3-Nitroaniline	1330	J, D	3640	ug/kg dry	2208.4	3530 U	60	40-130		
4,6-Dinitro-2-methylphenol	1560	D	729	ug/kg dry	2208.4	707 U	71	20-140		
4-Bromophenyl Phenyl Ether	1260	D	729	ug/kg dry	2208.4	707 U	57	45-115		
4-Chloro-3-methylphenol	1350	D	729	ug/kg dry	2208.4	707 U	61	35-115		
4-Chloroaniline	776	D	729	ug/kg dry	2208.4	707 U	35	10-100		
4-Chlorophenyl Phenyl Ether	1370	D	729	ug/kg dry	2208.4	707 U	62	45-110		
3- and/or 4-Methylphenol	1340	D	729	ug/kg dry	2208.4	707 U	61	40-120		
4-Nitroaniline	1220	J, D	3640	ug/kg dry	2208.4	3530 U	55	40-130		
4-Nitrophenol	750	J, D	3640	ug/kg dry	2208.4	3530 U	34	15-140		
Acenaphthene	1320	D	729	ug/kg dry	2208.4	707 U	60	45-110		
Acenaphthylene	1030	D	729	ug/kg dry	2208.4	707 U	47	45-115		
Anthracene	1260	D	729	ug/kg dry	2208.4	707 U	57	45-130		
Benz[a]anthracene	1350	D	729	ug/kg dry	2208.4	707 U	61	45-130		
Benzo[a] pyrene	1210	D	729	ug/kg dry	2208.4	707 U	55	45-130		
Benzo[b] fluoranthene	1450	D	729	ug/kg dry	2208.4	707 U	66	40-130		
Benzo[g,h,i] perylene	1280	D	729	ug/kg dry	2208.4	707 U	58	45-125		

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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 L204023 - SW 3540C										
Matrix Spike (L204023-MS2)		**Source: 1204003-01**		Prepared: 04/03/2012 Analyzed: 04/05/2012						
Benzo[k] fluoranthene	1430	D	729	ug/kg dry	2208.4	707 U	65	45-125		
Bis(2-chloroethoxy) methane	1230	D	729	ug/kg dry	2208.4	707 U	56	45-110		
Bis(2-chloroethyl) ether	1160	D	729	ug/kg dry	2208.4	707 U	53	40-110		
Bis(2-chloroisopropyl) ether	1210	D	729	ug/kg dry	2208.4	707 U	55	30-115		
Bis(2-ethylhexyl) phthalate	1400	D	729	ug/kg dry	2208.4	707 U	63	40-145		
Butyl Benzyl Phthalate	1400	D	729	ug/kg dry	2208.4	707 U	63	50-125		
Carbazole	1630	D	729	ug/kg dry	2208.4	707 U	74	40-140		
Chrysene	1420	D	729	ug/kg dry	2208.4	707 U	64	45-130		
Dibenz[a,h]anthracene	1140	D	729	ug/kg dry	2208.4	707 U	51	45-125		
Dibenzofuran	1420	D	729	ug/kg dry	2208.4	707 U	64	45-120		
Diethyl Phthalate	1410	D	729	ug/kg dry	2208.4	707 U	64	50-125		
Dimethyl Phthalate	1360	D	729	ug/kg dry	2208.4	707 U	61	45-130		
Di-n-butyl Phthalate	1360	D	729	ug/kg dry	2208.4	707 U	62	50-130		
Di-n-octyl Phthalate	1500	D	729	ug/kg dry	2208.4	707 U	68	40-150		
Fluoranthene	1410	D	729	ug/kg dry	2208.4	707 U	64	45-130		
Fluorene	1370	D	729	ug/kg dry	2208.4	707 U	62	45-120		
Hexachlorobenzene	1300	D	729	ug/kg dry	2208.4	707 U	59	45-130		
Hexachlorobutadiene	1320	D	729	ug/kg dry	2208.4	707 U	60	45-105		
Hexachlorocyclopentadiene	117	J, D	729	ug/kg dry	2208.4	707 U	5*	10-100		
Hexachloroethane	1140	D	729	ug/kg dry	2208.4	707 U	52	35-110		
Indeno[1,2,3-cd]pyrene	1220	D	729	ug/kg dry	2208.4	707 U	55	45-130		
Isophorone	1170	D	729	ug/kg dry	2208.4	707 U	53	40-110		
Naphthalene	1400	D	729	ug/kg dry	2208.4	707 U	63	40-110		
Nitrobenzene	1130	D	729	ug/kg dry	2208.4	707 U	51	40-105		
N-Nitrosodi-n-propylamine	1270	D	729	ug/kg dry	2208.4	707 U	57	30-130		
N-Nitrosodiphenylamine	1240	D	729	ug/kg dry	2208.4	707 U	56	50-120		
Pentachlorophenol	790	J, D	3640	ug/kg dry	2208.4	3530 U	36	25-120		
Phenanthrene	1380	D	729	ug/kg dry	2208.4	707 U	63	50-120		
Phenol	1260	D	729	ug/kg dry	2208.4	707 U	57	40-115		
Pyrene	1350	D	729	ug/kg dry	2208.4	707 U	61	45-125		
Surrogate: 2-Fluorophenol	*1630*			*ug/kg dry*	*2760.5*		*59*	*25-121*		
Surrogate: Phenol-d5	*1800*			*ug/kg dry*	*2760.5*		*65*	*24-113*		
Surrogate: Nitrobenzene-d5	*1100*			*ug/kg dry*	*1840.3*		*60*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1180*			*ug/kg dry*	*1840.3*		*64*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1230*			*ug/kg dry*	*2760.5*		*45*	*19-122*		
Surrogate: p-Terphenyl-d14	*1300*			*ug/kg dry*	*1840.3*		*71*	*18-137*		

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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 L204023 - SW 3540C										
Matrix Spike Dup (L204023-MSD2)		**Source: 1204003-01**		Prepared: 04/03/2012 Analyzed: 04/09/2012						
1,2,4-Trichlorobenzene	1210	D	867	ug/kg dry	2626.9	707 U	46	45-110	13	40
1,2-Dichlorobenzene	1250	D	867	ug/kg dry	2626.9	707 U	48	45-105	17	40
1,3-Dichlorobenzene	1230	D	867	ug/kg dry	2626.9	707 U	47	40-100	13	40
1,4-Dichlorobenzene	1240	D	867	ug/kg dry	2626.9	707 U	47	35-105	15	40
2,4,5-Trichlorophenol	1280	D	867	ug/kg dry	2626.9	707 U	49	30-140	27	40
2,4,6-Trichlorophenol	1280	D	867	ug/kg dry	2626.9	707 U	49	20-110	4	40
2,4-Dichlorophenol	1260	D	867	ug/kg dry	2626.9	707 U	48	40-110	19	40
2,4-Dimethylphenol	1310	D	867	ug/kg dry	2626.9	707 U	50	30-105	2	40
2,4-Dinitrophenol	1130	J, D	4330	ug/kg dry	2626.9	3530 U	43	25-130	49*	40
2,4-Dinitrotoluene	1360	D	867	ug/kg dry	2626.9	707 U	52	50-115	26	40
2,6-Dinitrotoluene	1200	D	867	ug/kg dry	2626.9	707 U	46	40-120	32	40
2-Chloronaphthalene	1310	D	867	ug/kg dry	2626.9	707 U	50	45-115	10	40
2-Chlorophenol	1220	D	867	ug/kg dry	2626.9	707 U	47	45-105	19	40
2-Methylnaphthalene	1260	D	867	ug/kg dry	2626.9	707 U	48	45-110	23	40
2-Methylphenol	1220	D	867	ug/kg dry	2626.9	707 U	46	40-120	34	40
2-Nitroaniline	1460	J, D	4330	ug/kg dry	2626.9	3530 U	56	45-120	10	40
2-Nitrophenol	1310	D	867	ug/kg dry	2626.9	707 U	50	40-110	11	40
3,3'-Dichlorobenzidine	1360	J, D	1730	ug/kg dry	2626.9	1410 U	52	15-130	40	40
3-Nitroaniline	1270	J, D	4330	ug/kg dry	2626.9	3530 U	48	40-130	23	40
4,6-Dinitro-2-methylphenol	1060	D	867	ug/kg dry	2626.9	707 U	40	20-140	54*	40
4-Bromophenyl Phenyl Ether	1450	D	867	ug/kg dry	2626.9	707 U	55	45-115	4	40
4-Chloro-3-methylphenol	1330	D	867	ug/kg dry	2626.9	707 U	50	35-115	19	40
4-Chloroaniline	936	D	867	ug/kg dry	2626.9	707 U	36	10-100	1	40
4-Chlorophenyl Phenyl Ether	1280	D	867	ug/kg dry	2626.9	707 U	49	45-110	23	40
3- and/or 4-Methylphenol	1130	D	867	ug/kg dry	2626.9	707 U	43	40-120	34	40
4-Nitroaniline	936	J, D	4330	ug/kg dry	2626.9	3530 U	36*	40-130	43*	40
4-Nitrophenol	1450	J, D	4330	ug/kg dry	2626.9	3530 U	55	15-140	47*	40
Acenaphthene	1280	D	867	ug/kg dry	2626.9	707 U	49	45-110	20	40
Acenaphthylene	1220	D	867	ug/kg dry	2626.9	707 U	47	45-115	0.2	40
Anthracene	1100	D	867	ug/kg dry	2626.9	707 U	42*	45-130	30	40
Benz[a]anthracene	1210	D	867	ug/kg dry	2626.9	707 U	46	45-130	28	40
Benzo[a] pyrene	1140	D	867	ug/kg dry	2626.9	707 U	43*	45-130	23	40
Benzo[b] fluoranthene	1070	D	867	ug/kg dry	2626.9	707 U	41	40-130	47*	40
Benzo[g,h,i] perylene	1310	D	867	ug/kg dry	2626.9	707 U	50	45-125	15	40
Benzo[k] fluoranthene	1110	D	867	ug/kg dry	2626.9	707 U	42*	45-125	42*	40
Bis(2-chloroethoxy) methane	1340	D	867	ug/kg dry	2626.9	707 U	51	45-110	9	40

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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 L204023 - SW 3540C										
Matrix Spike Dup (L204023-MSD2)		**Source: 1204003-01**		Prepared: 04/03/2012 Analyzed: 04/09/2012						
Bis(2-chloroethyl) ether	1210	D	867	ug/kg dry	2626.9	707 U	46	40-110	13	40
Bis(2-chloroisopropyl) ether	1230	D	867	ug/kg dry	2626.9	707 U	47	30-115	16	40
Bis(2-ethylhexyl) phthalate	1190	D	867	ug/kg dry	2626.9	707 U	45	40-145	34	40
Butyl Benzyl Phthalate	1190	D	867	ug/kg dry	2626.9	707 U	45*	50-125	33	40
Carbazole	1480	D	867	ug/kg dry	2626.9	707 U	56	40-140	27	40
Chrysene	1290	D	867	ug/kg dry	2626.9	707 U	49	45-130	27	40
Dibenz[a,h]anthracene	1270	D	867	ug/kg dry	2626.9	707 U	48	45-125	6	40
Dibenzofuran	1310	D	867	ug/kg dry	2626.9	707 U	50	45-120	25	40
Diethyl Phthalate	1430	D	867	ug/kg dry	2626.9	707 U	54	50-125	16	40
Dimethyl Phthalate	1460	D	867	ug/kg dry	2626.9	707 U	56	45-130	10	40
Di-n-butyl Phthalate	1060	D	867	ug/kg dry	2626.9	707 U	40*	50-130	42*	40
Di-n-octyl Phthalate	1030	D	867	ug/kg dry	2626.9	707 U	39*	40-150	54*	40
Fluoranthene	1220	D	867	ug/kg dry	2626.9	707 U	46	45-130	32	40
Fluorene	1270	D	867	ug/kg dry	2626.9	707 U	48	45-120	25	40
Hexachlorobenzene	1220	D	867	ug/kg dry	2626.9	707 U	47	45-130	24	40
Hexachlorobutadiene	1340	D	867	ug/kg dry	2626.9	707 U	51	45-105	16	40
Hexachlorocyclopentadiene	480	J, D	867	ug/kg dry	2626.9	707 U	18	10-100	110*	40
Hexachloroethane	1180	D	867	ug/kg dry	2626.9	707 U	45	35-110	14	40
Indeno[1,2,3-cd]pyrene	1280	D	867	ug/kg dry	2626.9	707 U	49	45-130	13	40
Isophorone	1120	D	867	ug/kg dry	2626.9	707 U	43	40-110	21	40
Naphthalene	1440	D	867	ug/kg dry	2626.9	707 U	55	40-110	14	40
Nitrobenzene	1280	D	867	ug/kg dry	2626.9	707 U	49	40-105	5	40
N-Nitrosodi-n-propylamine	1160	D	867	ug/kg dry	2626.9	707 U	44	30-130	26	40
N-Nitrosodiphenylamine	1210	D	867	ug/kg dry	2626.9	707 U	46*	50-120	19	40
Pentachlorophenol	1130	J, D	4330	ug/kg dry	2626.9	3530 U	43	25-120	18	40
Phenanthrene	1130	D	867	ug/kg dry	2626.9	707 U	43*	50-120	37	40
Phenol	1180	D	867	ug/kg dry	2626.9	707 U	45	40-115	23	40
Pyrene	1110	D	867	ug/kg dry	2626.9	707 U	42*	45-125	36	40
Surrogate: 2-Fluorophenol	*1450*			*ug/kg dry*	*3283.6*		*44*	*25-121*		
Surrogate: Phenol-d5	*1500*			*ug/kg dry*	*3283.6*		*46*	*24-113*		
Surrogate: Nitrobenzene-d5	*1130*			*ug/kg dry*	*2189.1*		*51*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1140*			*ug/kg dry*	*2189.1*		*52*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1550*			*ug/kg dry*	*3283.6*		*47*	*19-122*		
Surrogate: p-Terphenyl-d14	*966*			*ug/kg dry*	*2189.1*		*44*	*18-137*		

PREPARATION BENCH SHEET

L204023

Lionville Laboratory

Printed: 4/4/2012 12:16:30PM

00000053

Matrix: Solid **Prepared using: SVOCGCMS - SW 3540C** **Surrogate used: 1200170**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204002-01	8270C TCL SVOC	04/03/2012 12:33	30.24	4				500	WC-Hanford, Inc.	
1204003-01	8270C TCL SVOC	04/03/2012 12:33	30.62	1				500	WC-Hanford, Inc.	
L204023-BLK1	QC	04/03/2012 12:33	30	1				500		
L204023-BS1	QC	04/03/2012 12:33	30	1	1200337		600	500		
L204023-MS1	QC	04/03/2012 12:33	30.4	4	1200337	1204002-01	600	500		
L204023-MS2	QC	04/03/2012 12:33	29.69	1	1200337	1204003-01	600	500		
L204023-MSD1	QC	04/03/2012 12:33	30.22	4	1200337	1204002-01	600	500		
L204023-MSD2	QC	04/03/2012 12:33	24.96	1	1200337	1204003-01	600	500		

4/4/12 1216
Extracts Relinquished By Date

4/4/12 1220
Extracts Received By Date

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/24/2012 12:03

Analytical Report for TCLP Semivolatiles by SW846 1311/8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

SEMIVOLATILE - TCLP

One (1) leachate sample was generated from a soil sample collected on 03-29-2012.

The sample and associated QC samples were leached 04-04-2012, extracted 04-10-2012 and analyzed 04-12,13-2012 according to criteria set forth in Lionville Laboratory SOPs. The leaching procedure was based on SW846 Method 1311, the extraction procedure was based on SW846 Method 3520C, and the analysis procedure was based on SW846 Method 8270C.

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

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

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

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

4. The samples were extracted at five-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. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

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

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.

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

Iain Daniels
LvL Laboratory Manager

4/24/12
Date

GLOSSARY

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concetration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

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

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/24/2012 12:03

J1NP18
1204003-01 (Soil)

Lionville Laboratory

TCLP Semivolatiles by SW846 1311/8270C

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,4-Dichlorobenzene	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
2,4,5-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
2,4,6-Trichlorophenol	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
2,4-Dinitrotoluene	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
2-Methylphenol	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
3- and/or 4-Methylphenol	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Hexachlorobenzene	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Hexachlorobutadiene	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Hexachloroethane	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Nitrobenzene	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Pentachlorophenol	0.125	U	0.125	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Pyridine	0.0500	U	0.0500	mg/L	1	L204096	04/10/2012	04/12/2012	8270C
Surrogate: 2-Fluorophenol	*58 %*		*21-100*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*
Surrogate: Phenol-d5	*59 %*		*10-94*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*63 %*		*35-114*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*
Surrogate: 2-Fluorobiphenyl	*57 %*		*43-116*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*60 %*		*10-123*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*71 %*		*33-141*			*L204096*	*04/10/2012*	*04/12/2012*	*8270C*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/24/2012 12:03

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 L204096 - SW 3520C										
Blank (L204096-BLK1)				Prepared: 04/10/2012 Analyzed: 04/12/2012						
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	*0.262*			*mg/L*	*0.37500*		*70*	*21-100*		
Surrogate: Phenol-d5	*0.258*			*mg/L*	*0.37500*		*69*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.182*			*mg/L*	*0.25000*		*73*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.166*			*mg/L*	*0.25000*		*66*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.249*			*mg/L*	*0.37500*		*66*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.198*			*mg/L*	*0.25000*		*79*	*33-141*		
Blank (L204096-BLK2)				Prepared: 04/10/2012 Analyzed: 04/12/2012						
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	*0.236*			*mg/L*	*0.37500*		*63*	*21-100*		
Surrogate: Phenol-d5	*0.232*			*mg/L*	*0.37500*		*62*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.171*			*mg/L*	*0.25000*		*68*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.154*			*mg/L*	*0.25000*		*62*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.188*			*mg/L*	*0.37500*		*50*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.180*			*mg/L*	*0.25000*		*72*	*33-141*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/24/2012 12:03

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 L204096 - SW 3520C									
LCS (L204096-BS1)			Prepared: 04/10/2012 Analyzed: 04/12/2012						
1,4-Dichlorobenzene	0.118	0.0500	mg/L	0.30000		39	30-100		
2,4,5-Trichlorophenol	0.191	0.0500	mg/L	0.30000		64	45-125		
2,4,6-Trichlorophenol	0.181	0.0500	mg/L	0.30000		60	40-125		
2,4-Dinitrotoluene	0.203	0.0500	mg/L	0.30000		68	50-120		
2-Methylphenol	0.188	0.0500	mg/L	0.30000		63	40-110		
3- and/or 4-Methylphenol	0.186	0.0500	mg/L	0.30000		62	30-110		
Hexachlorobenzene	0.204	0.0500	mg/L	0.30000		68	50-110		
Hexachlorobutadiene	0.132	0.0500	mg/L	0.30000		44	30-100		
Hexachloroethane	0.107	0.0500	mg/L	0.30000		36	25-100		
Nitrobenzene	0.185	0.0500	mg/L	0.30000		62	40-110		
Pentachlorophenol	0.193	0.125	mg/L	0.30000		64	20-130		
Pyridine	0.153	0.0500	mg/L	0.30000		51	5-100		
Surrogate: 2-Fluorophenol	*0.238*		*mg/L*	*0.37500*		*63*	*21-100*		
Surrogate: Phenol-d5	*0.243*		*mg/L*	*0.37500*		*65*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.174*		*mg/L*	*0.25000*		*70*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.154*		*mg/L*	*0.25000*		*62*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.293*		*mg/L*	*0.37500*		*78*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.189*		*mg/L*	*0.25000*		*76*	*33-141*		
Matrix Spike (L204096-MS1)		**Source: 1204003-01**	Prepared: 04/10/2012 Analyzed: 04/13/2012						
1,4-Dichlorobenzene	0.145	0.0500	mg/L	0.30000	0.0500 U	48	30-100		
2,4,5-Trichlorophenol	0.204	0.0500	mg/L	0.30000	0.0500 U	68	45-125		
2,4,6-Trichlorophenol	0.186	0.0500	mg/L	0.30000	0.0500 U	62	40-125		
2,4-Dinitrotoluene	0.209	0.0500	mg/L	0.30000	0.0500 U	70	50-120		
2-Methylphenol	0.213	0.0500	mg/L	0.30000	0.0500 U	71	40-110		
3- and/or 4-Methylphenol	0.197	0.0500	mg/L	0.30000	0.0500 U	66	30-110		
Hexachlorobenzene	0.207	0.0500	mg/L	0.30000	0.0500 U	69	50-110		
Hexachlorobutadiene	0.168	0.0500	mg/L	0.30000	0.0500 U	56	30-100		
Hexachloroethane	0.146	0.0500	mg/L	0.30000	0.0500 U	49	25-100		
Nitrobenzene	0.213	0.0500	mg/L	0.30000	0.0500 U	71	40-110		
Pentachlorophenol	0.227	0.125	mg/L	0.30000	0.125 U	76	20-130		
Pyridine	0.158	0.0500	mg/L	0.30000	0.0500 U	53	5-100		
Surrogate: 2-Fluorophenol	*0.233*		*mg/L*	*0.37500*		*62*	*21-100*		
Surrogate: Phenol-d5	*0.238*		*mg/L*	*0.37500*		*64*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.187*		*mg/L*	*0.25000*		*75*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.155*		*mg/L*	*0.25000*		*62*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.280*		*mg/L*	*0.37500*		*75*	*10-123*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/24/2012 12:03

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 L204096 - SW 3520C									
Matrix Spike (L204096-MS1)		**Source: 1204003-01**	Prepared: 04/10/2012 Analyzed: 04/13/2012						
Surrogate: p-Terphenyl-d14	*0.184*		*mg/L*	*0.25000*		*74*	*33-141*		
Matrix Spike Dup (L204096-MSD1)		**Source: 1204003-01**	Prepared: 04/10/2012 Analyzed: 04/13/2012						
1,4-Dichlorobenzene	0.164	0.0500	mg/L	0.30000	0.0500 U	55	30-100	12	20
2,4,5-Trichlorophenol	0.242	0.0500	mg/L	0.30000	0.0500 U	81	45-125	17	20
2,4,6-Trichlorophenol	0.225	0.0500	mg/L	0.30000	0.0500 U	75	40-125	19	20
2,4-Dinitrotoluene	0.231	0.0500	mg/L	0.30000	0.0500 U	77	50-120	10	20
2-Methylphenol	0.244	0.0500	mg/L	0.30000	0.0500 U	81	40-110	13	20
3- and/or 4-Methylphenol	0.232	0.0500	mg/L	0.30000	0.0500 U	77	30-110	16	20
Hexachlorobenzene	0.265	0.0500	mg/L	0.30000	0.0500 U	88	50-110	25*	20
Hexachlorobutadiene	0.197	0.0500	mg/L	0.30000	0.0500 U	66	30-100	16	20
Hexachloroethane	0.165	0.0500	mg/L	0.30000	0.0500 U	55	25-100	12	20
Nitrobenzene	0.235	0.0500	mg/L	0.30000	0.0500 U	78	40-110	10	20
Pentachlorophenol	0.280	0.125	mg/L	0.30000	0.125 U	93	20-130	21*	20
Pyridine	0.191	0.0500	mg/L	0.30000	0.0500 U	64	5-100	19	20
Surrogate: 2-Fluorophenol	*0.259*		*mg/L*	*0.37500*		*69*	*21-100*		
Surrogate: Phenol-d5	*0.266*		*mg/L*	*0.37500*		*71*	*10-94*		
Surrogate: Nitrobenzene-d5	*0.206*		*mg/L*	*0.25000*		*82*	*35-114*		
Surrogate: 2-Fluorobiphenyl	*0.176*		*mg/L*	*0.25000*		*71*	*43-116*		
Surrogate: 2,4,6-Tribromophenol	*0.363*		*mg/L*	*0.37500*		*97*	*10-123*		
Surrogate: p-Terphenyl-d14	*0.198*		*mg/L*	*0.25000*		*79*	*33-141*		

Lionville Laboratory

TCLP EXTRACTION RECORD
(NON-VOLATILES)

LOGBOOK # 1101

Start Date: 4-4-12 Start Time: 12:34 Analyst: RH SOP: SPI-1311.1	End Date: 4-5-12 End Time: 7:00 Analyst: RH Method: 1311.1	Tumbler Speed: 30 RPM Leachate Batch #: L204028 Leachate Page: 1 of 1 Room Temp. (°C): Start 21 /Finish 21 Acceptance Criteria: 23°C ± 2°

LvL #: 1204003-01 Client ID#: JINP18 pH After 5 Min: 9.58 pH After Acid/Heat: 2.24 Extraction Fluid/pH: #1 4.94 Sample Wt.(g): 100 Extract Fluid Vol.(mL): 2000 pH After Extraction: 4.90	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: _____
LvL #: L204028 Client ID#: N/A pH After 5 Min: N/A pH After Acid/Heat: N/A Extraction Fluid/pH: N/A Sample Wt.(g): N/A Extract Fluid Vol.(mL): N/A pH After Extraction: N/A	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added: * BLANK *
LvL # Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added:
LvL #: Client ID#: pH After 5 Min: pH After Acid/Heat: Extraction Fluid/pH: Sample Wt.(g): Extract Fluid Vol.(mL): pH After Extraction:	Initial Filtration Data and Comments: Solids: _____% / NA Initial Filtrate Added:

Standard	ID	Prep Date	Expir Date
MS			

Reviewed By/Date [illegible] 4/10/12

SPI-1311.1-A-0310

Page #

PREPARATION BENCH SHEET

L204096

Lionville Laboratory

Printed: 4/24/2012 11:29:17AM

Matrix: Water **Prepared using: SVOCGCMS - SW 3520C** **Surrogate used: 1200170**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204003-01	1311/8270C TCLP SVOC	04/10/2012 11:02	200	1				500	WC-Hanford, Inc.	WCH TCLP
1204003-01RE1	8270C TCL SVOC	04/10/2012 11:02	1	1				500	WC-Hanford, Inc.	Added for BatchQC in: L204096
1204007-01	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	LQA	LQA
1204029-15	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 5, REPORT @ LOD
1204035-04	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 2, Includes Benzidine
L204096-BLK1	QC	04/10/2012 11:02	200	1				500		WCH TCLP
L204096-BLK2	QC	04/10/2012 11:02	200	1				500		leach blk L204028, associated with1204003
L204096-BLK3	QC	04/10/2012 11:02	1000	1				500		LQA
L204096-BLK4	QC	04/10/2012 11:02	1000	1				500		Table 2
L204096-BLK5	QC	04/10/2012 11:02	1000	1				500		Table 5
L204096-BS1	QC	04/10/2012 11:02	200	1	1200337		600	500		WCH TCLP
L204096-BS3	QC	04/10/2012 11:02	1000	1	1200337		600	500		LQA
L204096-BS4	QC	04/10/2012 11:02	1000	1	1200337		600	500		Table 2
L204096-BS5	QC	04/10/2012 11:02	1000	1	1200337		600	500		Table 5
L204096-MS1	QC	04/10/2012 11:02	200	1	1200337	1204003-01	600	500		WCH TCLP
L204096-MSD1	QC	04/10/2012 11:02	200	1	1200337	1204003-01	600	500		WCH TCLP

Adjusted initial volume Bill 01 BS1, MS1 + MSD1 Bay 4/24/12

Extracts Relinquished By Date Extracts Received By Date

PREPARATION BENCH SHEET

L204096

Lionville Laboratory

Printed: 4/12/2012 2:24:04PM

00000066

Matrix: Water **Prepared using: Extraction - SW 3520C** **Surrogate used: 1200170**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204003-01	1311/8270C TCLP SVOC	04/10/2012 11:02	200	1				500	WC-Hanford, Inc.	WCH
~~1204003-01RE1~~	~~8270C TCL SVOC~~	~~04/10/2012 11:02~~	~~1~~	~~1~~		VOID		~~500~~	~~WC-Hanford, Inc.~~	~~Added for BatchQC in: L204096~~
1204007-01	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	LQA	LQA
1204029-15	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 5, REPORT @ LOD
1204035-04	8270C TCL SVOC	04/10/2012 11:02	1000	1				500	URS/CH2M Oak Ridge (UCOR)	Table 2, Includes Benzidine
L204096-BLK1	QC	04/10/2012 11:02	1000	1				500		WCH
L204096-BLK2	QC	04/10/2012 11:02	200	1				500		leach blk L204028
L204096-BLK3	QC	04/10/2012 11:02	1000	1				500		LQA
L204096-BLK4	QC	04/10/2012 11:02	1000	1				500		Table 2
L204096-BLK5	QC	04/10/2012 11:02	1000	1				500		Table 5
L204096-BS1	QC	04/10/2012 11:02	1000	1	1200337		600	500		WCH
L204096-BS3	QC	04/10/2012 11:02	1000	1				500		LQA
L204096-BS4	QC	04/10/2012 11:02	1000	1				500		Table 2
L204096-BS5	QC	04/10/2012 11:02	1000	1				500		Table 5
L204096-BSD1	QC	04/10/2012 11:02	1000	1				500		WCH
L204096-BSD3	QC	04/10/2012 11:02	1000	1				500		LQA
L204096-BSD4	QC	04/10/2012 11:02	1000	1				500		Table 2
L204096-BSD5	QC	04/10/2012 11:02	1000	1				500		Table 5
L204096-MS1	QC	04/10/2012 11:02	1000	1	1200337	1204003-01	600	500		WCH
L204096-MSD1	QC	04/10/2012 11:02	1000	1	1200337	1204003-01	600	500		WCH

Extracts Relinquished By — Date: 4/12/12 1455

Extracts Received By — Date: 4/12/12 1510

PCBS

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/22/2012 08:43

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Received: 04-03-2012

PCBs

One (1) soil sample was collected on 03-29-2012.

The sample and associated QC samples were extracted 04-10-2012 and analyzed 04-13,14-2012 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. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. 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

4/24/12
Date

r:\group\data\2012\pcb\wc hanford\1204003jes.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.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/22/2012 08:43

J1NP18
1204003-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1221	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1232	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1242	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1248	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1254	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1260	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1262	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Aroclor 1268	14.5	U	14.5	ug/kg dry	1	L204103	04/10/2012	04/13/2012	8082
Surrogate: Decachlorobiphenyl	*73 %*		*43-144*			*L204103*	*04/10/2012*	*04/13/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*63 %*		*52-141*			*L204103*	*04/10/2012*	*04/13/2012*	*8082*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/22/2012 08:43

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 L204103 - SW 3540C										
Blank (L204103-BLK1)				Prepared: 04/10/2012 Analyzed: 04/13/2012						
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	*30.9*			*ug/kg wet*	*33.333*		*93*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.9*			*ug/kg wet*	*33.337*		*96*	*52-141*		
LCS (L204103-BS1)				Prepared: 04/10/2012 Analyzed: 04/13/2012						
Aroclor 1016	136		13.3	ug/kg wet	166.67		81	50-138		
Aroclor 1260	161		13.3	ug/kg wet	166.67		96	50-148		
Surrogate: Decachlorobiphenyl	*36.3*			*ug/kg wet*	*33.333*		*109*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*34.3*			*ug/kg wet*	*33.337*		*103*	*52-141*		
Matrix Spike (L204103-MS1)		**Source: 1204003-01**		Prepared: 04/10/2012 Analyzed: 04/14/2012						
Aroclor 1016	144		14.4	ug/kg dry	180.68	14.5 U	79	50-138		
Aroclor 1260	184		14.4	ug/kg dry	180.68	14.5 U	102	50-148		
Surrogate: Decachlorobiphenyl	*39.8*			*ug/kg dry*	*36.137*		*110*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.1*			*ug/kg dry*	*36.140*		*97*	*52-141*		
Matrix Spike Dup (L204103-MSD1)		**Source: 1204003-01**		Prepared: 04/10/2012 Analyzed: 04/14/2012						
Aroclor 1016	156		14.1	ug/kg dry	177.00	14.5 U	88	50-138	11	40
Aroclor 1260	198		14.1	ug/kg dry	177.00	14.5 U	112	50-148	9	40
Surrogate: Decachlorobiphenyl	*42.2*			*ug/kg dry*	*35.399*		*119*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*38.0*			*ug/kg dry*	*35.403*		*107*	*52-141*		

PREPARATION BENCH SHEET

L204103

Lionville Laboratory

Printed: 4/11/2012 4:04:25PM

00000073

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1200108**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204003-01	8082 PCBs	04/10/2012 15:30	30.07	10				250	WC-Hanford, Inc.	
1204017-02	8082 PCBs	04/10/2012 15:30	30.05	10				250	WC-Hanford, Inc.	
1204017-03	8082 PCBs	04/10/2012 15:30	30.17	10				250	WC-Hanford, Inc.	
1204017-04	8082 PCBs	04/10/2012 15:30	30.23	10				250	WC-Hanford, Inc.	
1204017-05	8082 PCBs	04/10/2012 15:30	30.42	10				250	WC-Hanford, Inc.	
1204027-02	8082 PCBs	04/10/2012 15:30	30.9	10				250	WC-Hanford, Inc.	
1204027-03	8082 PCBs	04/10/2012 15:30	30.59	10				250	WC-Hanford, Inc.	
1204027-04	8082 PCBs	04/10/2012 15:30	30.52	10				250	WC-Hanford, Inc.	
L204103-BLK1	QC	04/10/2012 15:30	30	10				250		
L204103-BS1	QC	04/10/2012 15:30	30	10	1200123		250	250		
L204103-MS1	QC	04/10/2012 15:30	30.24	10	1200123	1204003-01	250	250		
L204103-MS2	QC	04/10/2012 15:30	30.16	10	1200123	1204017-03	250	250		
L204103-MS3	QC	04/10/2012 15:30	30.19	10	1200123	1204027-02	250	250		
L204103-MSD1	QC	04/10/2012 15:30	30.87	10	1200123	1204003-01	250	250		
L204103-MSD2	QC	04/10/2012 15:30	30.47	10	1200123	1204017-03	250	250		
L204103-MSD3	QC	04/10/2012 15:30	30.77	10	1200123	1204027-02	250	250		

S cleaned 04.13.12 SZ
(Ca Lot# G16W031)

4/11/12 1600 — Extracts Relinquished By — Date

LK 4/12/12 — Extracts Received By — Date

DIESEL

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: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/09/2012 22:23

Analytical Report for Extractable Petroleum Hydrocarbons by SW846 8015

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 03-29-2012.

The sample and associated QC samples were extracted 04-05-2012 and analyzed 04-07-2012 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. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. 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

4/12/12
Date

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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 22:23

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

GLOSSARY OF DATA

DATA QUALIFIERS

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

ABBREVIATIONS

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

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/09/2012 22:23

J1NP18
1204003-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Extractable Petroleum Hydrocarbons by SW846 8015									
Diesel Range Organics	3970	U	3970	ug/kg dry	1	L204050	04/05/2012	04/07/2012	8015M
Motor Oil	11900	U	11900	ug/kg dry	1	L204050	04/05/2012	04/07/2012	8015M
Surrogate: p-Terphenyl	*75 %*		*39-129*			*L204050*	*04/05/2012*	*04/07/2012*	*8015M*

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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 22:23

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 L204050 - SW 3540C										
Blank (L204050-BLK1)				Prepared: 04/05/2012 Analyzed: 04/07/2012						
Diesel Range Organics	3330	U	3330	ug/kg wet						
Motor Oil	10000	U	10000	ug/kg wet						
Surrogate: p-Terphenyl	*4290*			*ug/kg wet*	*6666.7*		*64*	*39-129*		
LCS (L204050-BS1)				Prepared: 04/05/2012 Analyzed: 04/07/2012						
Diesel Range Organics	42200		3330	ug/kg wet	66667		63	42-133		40
Surrogate: p-Terphenyl	*4770*			*ug/kg wet*	*6666.7*		*71*	*39-129*		
Matrix Spike (L204050-MS1)		**Source: 1204003-01**		Prepared: 04/05/2012 Analyzed: 04/07/2012						
Diesel Range Organics	50900		4020	ug/kg dry	80351	3970 U	63	42-133		40
Surrogate: p-Terphenyl	*5930*			*ug/kg dry*	*8035.1*		*74*	*39-129*		
Matrix Spike Dup (L204050-MSD1)		**Source: 1204003-01**		Prepared: 04/05/2012 Analyzed: 04/07/2012						
Diesel Range Organics	61800		4240	ug/kg dry	84777	3970 U	73	42-133	14	40
Surrogate: p-Terphenyl	*7180*			*ug/kg dry*	*8477.7*		*85*	*39-129*		

PREPARATION BENCH SHEET

L204050

Lionville Laboratory

Printed: 4/6/2012 11:23:55AM

000000081

Matrix: Solid

Prepared using: GC - SW 3540C

Surrogate used: 1101937

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1204003-01	8015M DRO	04/05/2012 14:51	27.49	1				1000	WC-Hanford, Inc.	
1204018-01	8015M DRO	04/05/2012 14:51	31.3	1				1000	WC-Hanford, Inc.	
1204018-02	8015M DRO	04/05/2012 14:51	30.8	1				1000	WC-Hanford, Inc.	
1204018-03	8015M DRO	04/05/2012 14:51	30.37	1				1000	WC-Hanford, Inc.	
1204018-04	8015M DRO	04/05/2012 14:51	30.6	1				1000	WC-Hanford, Inc.	
1204018-05	8015M DRO	04/05/2012 14:51	30.78	1				1000	WC-Hanford, Inc.	
1204018-06	8015M DRO	04/05/2012 14:51	30.72	1				1000	WC-Hanford, Inc.	
1204018-07	8015M DRO	04/05/2012 14:51	30.65	1				1000	WC-Hanford, Inc.	
1204018-08	8015M DRO	04/05/2012 14:51	30.01	1				1000	WC-Hanford, Inc.	
1204018-09	8015M DRO	04/05/2012 14:51	31.46	1				1000	WC-Hanford, Inc.	
1204018-10	8015M DRO	04/05/2012 14:51	30.83	1				1000	WC-Hanford, Inc.	
1204018-11	8015M DRO	04/05/2012 14:51	30.54	1				1000	WC-Hanford, Inc.	
1204018-12	8015M DRO	04/05/2012 14:51	30.61	1				1000	WC-Hanford, Inc.	
1204018-14	8015M DRO	04/05/2012 14:51	30.85	1				1000	WC-Hanford, Inc.	
L204050-BLK1	QC	04/05/2012 14:51	30	1				1000		
L204050-BS1	QC	04/05/2012 14:51	30	1	1101936		1000	1000		
L204050-MS1	QC	04/05/2012 14:51	27.2	1	1101936	1204003-01	1000	1000		
L204050-MS2	QC	04/05/2012 14:51	30.19	1	1101936	1204018-02	1000	1000		
L204050-MSD1	QC	04/05/2012 14:51	25.78	1	1101936	1204003-01	1000	1000		
L204050-MSD2	QC	04/05/2012 14:51	29.81	1	1101936	1204018-02	1000	1000		

Extracts Relinquished By: [signature] 4/6/12 1123 — Date

Extracts Received By: LK 4-6-12 — Date

PAHs

LIONVILLE LABORATORY
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Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/12/2012 19:35

Analytical Report for Polynuclear Aromatic Compounds by SW846 8310

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL #: 1204003

W.O. #: 60049-001-001-0001-00
Date Received: 04-03-2012

POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)

One (1) soil sample was collected on 03-29-2012.

The sample and associated QC samples were extracted 04-09-2012 and analyzed 04-11-2012 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. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. 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

4/18/12
Date

r:\group\data\2012\pah 8310\wc hanford\1204003jes.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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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/12/2012 19:35

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

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: K3854 Project Manager: Joan Kessner	**Reported:** 04/12/2012 19:35

J1NP18
1204003-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polynuclear Aromatic Compounds by SW846 8310									
Naphthalene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Acenaphthylene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Acenaphthene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Fluorene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Phenanthrene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Anthracene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Fluoranthene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Indeno[1,2,3-cd]pyrene	**5.71**		3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Pyrene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benz[a]anthracene	**1.40**	J	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Chrysene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[b] fluoranthene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[k] fluoranthene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[a] pyrene	**1.07**	J	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Dibenz[a,h]anthracene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Benzo[g,h,i] perylene	3.51	U	3.51	ug/kg dry	1	L204079	04/09/2012	04/11/2012	8310
Surrogate: Triphenylene	*83 %*		*68-129*			*L204079*	*04/09/2012*	*04/11/2012*	*8310*

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/12/2012 19:35

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 L204079 - SW 3540C										
Blank (L204079-BLK1)				Prepared: 04/09/2012 Analyzed: 04/11/2012						
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	1.00	J	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	*148*			*ug/kg wet*	*166.67*		*89*	*68-129*		
LCS (L204079-BS1)				Prepared: 04/09/2012 Analyzed: 04/11/2012						
Naphthalene	177		3.33	ug/kg wet	166.67		106	0-127		
Acenaphthylene	140		3.33	ug/kg wet	166.67		84	50-140		
Acenaphthene	132		3.33	ug/kg wet	166.67		79	17-139		
Fluorene	143		3.33	ug/kg wet	166.67		86	28-145		
Phenanthrene	150		3.33	ug/kg wet	166.67		90	30-152		
Anthracene	119		3.33	ug/kg wet	166.67		72	19-171		
Fluoranthene	149		3.33	ug/kg wet	166.67		90	34-159		
Indeno[1,2,3-cd]pyrene	155		3.33	ug/kg wet	166.67		93	31-156		
Pyrene	149		3.33	ug/kg wet	166.67		90	33-152		
Benz[a]anthracene	163		3.33	ug/kg wet	166.67		98	32-157		
Chrysene	147		3.33	ug/kg wet	166.67		88	31-159		
Benzo[b] fluoranthene	146		3.33	ug/kg wet	166.67		88	33-164		
Benzo[k] fluoranthene	147		3.33	ug/kg wet	166.67		88	28-161		
Benzo[a] pyrene	182		3.33	ug/kg wet	166.67		109	29-149		
Dibenz[a,h]anthracene	139		3.33	ug/kg wet	166.67		83	27-153		
Benzo[g,h,i] perylene	154		3.33	ug/kg wet	166.67		93	32-157		
Surrogate: Triphenylene	*152*			*ug/kg wet*	*166.67*		*91*	*68-129*		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/12/2012 19:35

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 L204079 - SW 3540C									
Matrix Spike (L204079-MS1)		**Source: 1204003-01**	Prepared: 04/09/2012 Analyzed: 04/11/2012						
Naphthalene	174	3.60	ug/kg dry	180.21	3.51 U	97	0-127		
Acenaphthylene	149	3.60	ug/kg dry	180.21	3.51 U	83	50-140		
Acenaphthene	142	3.60	ug/kg dry	180.21	3.51 U	79	17-139		
Fluorene	152	3.60	ug/kg dry	180.21	3.51 U	84	28-145		
Phenanthrene	160	3.60	ug/kg dry	180.21	3.51 U	89	30-152		
Anthracene	126	3.60	ug/kg dry	180.21	3.51 U	70	19-171		
Fluoranthene	160	3.60	ug/kg dry	180.21	3.51 U	89	34-159		
Indeno[1,2,3-cd]pyrene	170	3.60	ug/kg dry	180.21	5.71	91	31-156		
Pyrene	152	3.60	ug/kg dry	180.21	3.51 U	84	33-152		
Benz[a]anthracene	174	3.60	ug/kg dry	180.21	1.40	96	32-157		
Chrysene	160	3.60	ug/kg dry	180.21	3.51 U	89	31-159		
Benzo[b] fluoranthene	191	3.60	ug/kg dry	180.21	3.51 U	106	33-164		
Benzo[k] fluoranthene	164	3.60	ug/kg dry	180.21	3.51 U	91	28-161		
Benzo[a] pyrene	200	3.60	ug/kg dry	180.21	1.07	111	29-149		
Dibenz[a,h]anthracene	145	3.60	ug/kg dry	180.21	3.51 U	81	27-153		
Benzo[g,h,i] perylene	161	3.60	ug/kg dry	180.21	3.51 U	89	32-157		
Surrogate: Triphenylene	*159*		*ug/kg dry*	*180.21*		*88*	*68-129*		
Matrix Spike Dup (L204079-MSD1)		**Source: 1204003-01**	Prepared: 04/09/2012 Analyzed: 04/11/2012						
Naphthalene	174	3.70	ug/kg dry	185.09	3.51 U	94	0-127	3	40
Acenaphthylene	146	3.70	ug/kg dry	185.09	3.51 U	79	50-140	5	40
Acenaphthene	133	3.70	ug/kg dry	185.09	3.51 U	72	17-139	10	40
Fluorene	150	3.70	ug/kg dry	185.09	3.51 U	81	28-145	4	40
Phenanthrene	160	3.70	ug/kg dry	185.09	3.51 U	86	30-152	3	40
Anthracene	124	3.70	ug/kg dry	185.09	3.51 U	67	19-171	4	40
Fluoranthene	162	3.70	ug/kg dry	185.09	3.51 U	88	34-159	1	40
Indeno[1,2,3-cd]pyrene	174	3.70	ug/kg dry	185.09	5.71	91	31-156	0.5	40
Pyrene	163	3.70	ug/kg dry	185.09	3.51 U	88	33-152	5	40
Benz[a]anthracene	170	3.70	ug/kg dry	185.09	1.40	91	32-157	5	40
Chrysene	170	3.70	ug/kg dry	185.09	3.51 U	92	31-159	3	40
Benzo[b] fluoranthene	203	3.70	ug/kg dry	185.09	3.51 U	110	33-164	3	40
Benzo[k] fluoranthene	167	3.70	ug/kg dry	185.09	3.51 U	90	28-161	1	40
Benzo[a] pyrene	199	3.70	ug/kg dry	185.09	1.07	107	29-149	3	40
Dibenz[a,h]anthracene	149	3.70	ug/kg dry	185.09	3.51 U	81	27-153	0.2	40
Benzo[g,h,i] perylene	163	3.70	ug/kg dry	185.09	3.51 U	88	32-157	2	40
Surrogate: Triphenylene	*166*		*ug/kg dry*	*185.09*		*89*	*68-129*		

PREPARATION BENCH SHEET

L204079

Lionville Laboratory

Printed: 4/10/2012 11:20:19AM

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
1204003-01	8310 PAH	04/09/2012 13:03	31.12	5				50	WC-Hanford, Inc.	
1204027-02	8310 PAH	04/09/2012 13:03	30.12	5				50	WC-Hanford, Inc.	
1204027-03	8310 PAH	04/09/2012 13:03	30.31	5				50	WC-Hanford, Inc.	
1204027-04	8310 PAH	04/09/2012 13:03	31.16	5				50	WC-Hanford, Inc.	
L204079-BLK1	QC	04/09/2012 13:03	30	5				50		
L204079-BS1	QC	04/09/2012 13:03	30	5	1200436		50	50		
L204079-MS1	QC	04/09/2012 13:03	30.32	5	1200436	1204003-01	50	50		
L204079-MS2	QC	04/09/2012 13:03	30.18	5	1200436	1204027-02	50	50		
L204079-MSD1	QC	04/09/2012 13:03	29.52	5	1200436	1204003-01	50	50		
L204079-MSD2	QC	04/09/2012 13:03	30.72	5	1200436	1204027-02	50	50		

Extracts Relinquished By 4/10/12 1150 Date

Extracts Received By 4-10-12 Date

METALS

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228
LVL#: 1204003
SDG/SAF#: K3854/RC-228

W.O.#: 60049-001-001-0001-00
Date Received: 04-03-12

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.

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

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

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

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ) with the exception of CCB2 Iron (71.02 µg/L, RDL=50µg/L) in the soil data file. The method blank L204043-MB1 was below the 50µg/L RDL and the sample results for Iron were well above the reporting limit.

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

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer.

10. The matrix spike (MS) recoveries for 9 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

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.

analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1NP18	Aluminum	22,000	70.0
	Antimony	100	79.1
	Boron	100	78.0
	Cadmium	100	83.4
	Cobalt	100	79.9
	Iron	42,000	51.6
	Lead	100	77.2
	Nickel	100	78.5
	Selenium	100	80.0

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Cadmium was less than ten times the MDL.

13. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

4/27/12
Date

alm/04-003

LIONVILLE LABORATORY
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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

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: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

J1NP18
1204003-01 (Soil)

Lionville Laboratory

Metals by SW846 6000/7000 series

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	**6120**		4.48	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Antimony	0.537	U	0.537	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Arsenic	**2.08**		0.896	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Barium	**68.8**		0.448	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Beryllium	**0.261**		0.179	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Boron	**0.837**	B	1.79	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Cadmium	**0.0865**	B	0.179	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Calcium	**4990**		89.6	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Chromium	**6.56**		0.179	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Cobalt	**6.89**		1.79	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Copper	**12.0**		0.896	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Iron	**21400**		17.9	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Lead	**2.96**		0.448	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Magnesium	**3830**		67.2	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Manganese	**306**		4.48	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Molybdenum	**0.375**	B	1.79	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Nickel	**7.67**		3.58	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Potassium	**906**		358	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Selenium	0.269	U	0.269	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Silicon	**402**		1.79	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Silver	0.179	U	0.179	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Sodium	**269**		44.8	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Vanadium	**61.4**		2.24	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Zinc	**41.2**		8.96	mg/kg dry	1	L204043	04/05/2012	04/06/2012	6010B
Mercury	0.0273	U	0.0273	mg/kg dry	1	L204020	04/03/2012	04/03/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

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 L204020 - SW 7471A Prep										
Blank (L204020-BLK1)				Prepared & Analyzed: 04/03/2012						
Mercury	0.0273	U	0.0273	mg/kg wet						
Duplicate (L204020-DUP2)		**Source: 1204003-01**		Prepared & Analyzed: 04/03/2012						
Mercury	0.0259	U	0.0259	mg/kg dry		0.0273 U				20
Matrix Spike (L204020-MS2)		**Source: 1204003-01**		Prepared & Analyzed: 04/03/2012						
Mercury	0.168		0.0266	mg/kg dry	0.14767	0.0273 U	114	75-125		20
Reference (L204020-SRM1)				Prepared & Analyzed: 04/03/2012						
Mercury	1.24		0.0281	mg/kg wet	1.2900		96.2	62.6-138		
Batch L204043 - SW 3050B										
Blank (L204043-BLK1)				Prepared: 04/05/2012 Analyzed: 04/06/2012						
Aluminum	4.03	U	4.03	mg/kg wet						
Antimony	0.484	U	0.484	mg/kg wet						
Arsenic	0.806	U	0.806	mg/kg wet						
Barium	0.403	U	0.403	mg/kg wet						
Beryllium	0.161	U	0.161	mg/kg wet						
Boron	1.61	U	1.61	mg/kg wet						
Cadmium	0.161	U	0.161	mg/kg wet						
Calcium	80.6	U	80.6	mg/kg wet						
Chromium	0.161	U	0.161	mg/kg wet						
Cobalt	1.61	U	1.61	mg/kg wet						
Copper	0.806	U	0.806	mg/kg wet						
Iron	16.1	U	16.1	mg/kg wet						
Lead	0.403	U	0.403	mg/kg wet						
Magnesium	60.5	U	60.5	mg/kg wet						
Manganese	4.03	U	4.03	mg/kg wet						
Molybdenum	1.61	U	1.61	mg/kg wet						
Nickel	3.23	U	3.23	mg/kg wet						
Potassium	323	U	323	mg/kg wet						
Selenium	0.242	U	0.242	mg/kg wet						
Silicon	1.61	U	1.61	mg/kg wet						
Silver	0.161	U	0.161	mg/kg wet						
Sodium	40.3	U	40.3	mg/kg wet						
Vanadium	2.02	U	2.02	mg/kg wet						
Zinc	8.06	U	8.06	mg/kg wet						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

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 L204043 - SW 3050B										
Duplicate (L204043-DUP1)		**Source: 1204003-01**		Prepared: 04/05/2012 Analyzed: 04/06/2012						
Aluminum	6330		4.88	mg/kg dry		6120			3	20
Antimony	0.585	U	0.585	mg/kg dry		0.537 U				20
Arsenic	1.89		0.976	mg/kg dry		2.08			10	20
Barium	66.6		0.488	mg/kg dry		68.8			3	20
Beryllium	0.245		0.195	mg/kg dry		0.261			6	20
Boron	0.851	B	1.95	mg/kg dry		0.837			2	20
Cadmium	0.115	B	0.195	mg/kg dry		0.0865			28*	20
Calcium	4890		97.6	mg/kg dry		4990			2	20
Chromium	7.72		0.195	mg/kg dry		6.56			16	20
Cobalt	7.16		1.95	mg/kg dry		6.89			4	20
Copper	12.6		0.976	mg/kg dry		12.0			4	20
Iron	20800		19.5	mg/kg dry		21400			3	20
Lead	2.77		0.488	mg/kg dry		2.96			6	20
Magnesium	4200		73.2	mg/kg dry		3830			9	20
Manganese	300		4.88	mg/kg dry		306			2	20
Molybdenum	0.323	B	1.95	mg/kg dry		0.375			15	20
Nickel	9.22		3.90	mg/kg dry		7.67			18	20
Potassium	898		390	mg/kg dry		906			0.9	20
Selenium	0.293	U	0.293	mg/kg dry		0.269 U				20
Silicon	393		1.95	mg/kg dry		402			2	20
Silver	0.195	U	0.195	mg/kg dry		0.179 U				20
Sodium	254		48.8	mg/kg dry		269			6	20
Vanadium	58.2		2.44	mg/kg dry		61.4			5	20
Zinc	40.4		9.76	mg/kg dry		41.2			2	20
Matrix Spike (L204043-MS1)		**Source: 1204003-01**		Prepared: 04/05/2012 Analyzed: 04/06/2012						
Aluminum	7420		4.97	mg/kg dry	198.69	6120	655*	75-125		20
Antimony	18.5		0.596	mg/kg dry	49.672	0.537 U	37*	75-125		20
Arsenic	153		0.993	mg/kg dry	198.69	2.08	76	75-125		20
Barium	236		0.497	mg/kg dry	198.69	68.8	84	75-125		20
Beryllium	4.00		0.199	mg/kg dry	4.9672	0.261	75	75-125		20
Boron	69.3		1.99	mg/kg dry	99.344	0.837	69*	75-125		20
Cadmium	3.76		0.199	mg/kg dry	4.9672	0.0865	74*	75-125		20
Calcium	7480		99.3	mg/kg dry	2483.6	4990	100	75-125		20
Chromium	23.0		0.199	mg/kg dry	19.869	6.56	83	75-125		20
Cobalt	43.4		1.99	mg/kg dry	49.672	6.89	74*	75-125		20
Copper	31.3		0.993	mg/kg dry	24.836	12.0	77	75-125		20

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

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 L204043 - SW 3050B									
Matrix Spike (L204043-MS1)		**Source: 1204003-01**	Prepared: 04/05/2012 Analyzed: 04/06/2012						
Iron	21400	19.9	mg/kg dry	99.344	21400	11*	75-125		20
Lead	38.4	0.497	mg/kg dry	49.672	2.96	71*	75-125		20
Magnesium	5970	74.5	mg/kg dry	2483.6	3830	86	75-125		20
Manganese	345	4.97	mg/kg dry	49.672	306	80	75-125		20
Molybdenum	75.3	1.99	mg/kg dry	99.344	0.375	75	75-125		20
Nickel	44.5	3.97	mg/kg dry	49.672	7.67	74*	75-125		20
Potassium	2850	397	mg/kg dry	2483.6	906	78	75-125		20
Selenium	142	0.298	mg/kg dry	198.69	0.269 U	71*	75-125		20
Silicon	508	1.99	mg/kg dry	99.344	402	106	75-125		20
Silver	3.76	0.199	mg/kg dry	4.9672	0.179 U	76	75-125		20
Sodium	2280	49.7	mg/kg dry	2483.6	269	81	75-125		20
Vanadium	99.4	2.48	mg/kg dry	49.672	61.4	77	75-125		20
Zinc	79.6	9.93	mg/kg dry	49.672	41.2	77	75-125		20
Reference (L204043-SRM1)			Prepared: 04/05/2012 Analyzed: 04/06/2012						
Aluminum	9420	10.9	mg/kg wet	6670.0		141	0-200.89		
Antimony	53.2	1.30	mg/kg wet	53.000		100	0-235.8		
Arsenic	107	2.17	mg/kg wet	114.00		94	82.8-117.54		
Barium	277	1.09	mg/kg wet	307.00		90	79.8-120.2		
Beryllium	98.7	0.435	mg/kg wet	108.00		91	82.8-117.6		
Boron	71.2	4.35	mg/kg wet	85.100		84	67.5-132.8		
Cadmium	207	0.435	mg/kg wet	225.00		92	83.6-116.4		
Calcium	3020	217	mg/kg wet	3360.0		90	83.3-116.9		
Chromium	75.7	0.435	mg/kg wet	77.200		98	73.3-126.4		
Cobalt	151	4.35	mg/kg wet	166.00		91	80.7-118.7		
Copper	245	2.17	mg/kg wet	271.00		90	80.8-119.2		
Iron	7840	43.5	mg/kg wet	8420.0		93	78.6-121.1		
Lead	169	1.09	mg/kg wet	190.00		89	81.6-118.4		
Magnesium	7390	163	mg/kg wet	8570.0		86	83.2-116.7		
Manganese	905	10.9	mg/kg wet	965.00		94	69.3-130.5		
Molybdenum	217	4.35	mg/kg wet	235.00		93	76.2-123.8		
Nickel	201	8.70	mg/kg wet	221.00		91	79.6-120.8		
Potassium	12900	870	mg/kg wet	14400		90	81.9-118.1		
Selenium	172	0.652	mg/kg wet	187.00		92	75.9-124.6		
Silicon	553	4.35	mg/kg wet	807.00		69	0-219.3		
Silver	77.2	0.435	mg/kg wet	83.500		92	82.7-117.1		
Sodium	8460	109	mg/kg wet	9730.0		87	82.5-117.2		

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/09/2012 13:06

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 L204043 - SW 3050B									
Reference (L204043-SRM1)			Prepared: 04/05/2012 Analyzed: 04/06/2012						
Vanadium	96.3	5.43	mg/kg wet	98.700		98	75.9-123.6		
Zinc	182	21.7	mg/kg wet	199.00		91	78.4-121.6		

Lionville Laboratory Logbook #: 111

SAMPLE DIGESTION RECORD

Digestion Batch #: L204093
Date/Time Initiated: 4/5/12 1005
Date/Time Completed: 4/5/12 1625
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: ✓ NA
Temp: 93
BLOCK 1 2 (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
L204003-d		0.61	50		TO	Coarse	Brown	Rocks	N/A
L204093-Rd		0.56	50		↓	↓	↓	↓	↓
-MS	0.5	0.55	50		↓	↓	↓	↓	↓
-BLK1		0.62	50		↓	Coarse	Boiling chips		↓
-SRM1	✓	0.69	50		↓	Fine	pink sand		↓

JJS
4/5/12

Spiking IDs / Expiration Date:
MS#: L200457

LCS#: ✓ L101357

Reagent IDs:
HNO_3 K44023
HCl K30036
H_2O_2 K09A03
1:1 HNO_3 637-056-04
1:1 HCl

File ID#:

Data Review By/Date: 4/6/12

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

Page #:

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 4/2/12
Start Time/Temp: 95° / 1920
End Time/Temp: 98 / 1955

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

Logbook # 1094
Prep Batch: L204010
Worksheet: HG040301
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank				10ml	50	
0.2 ug/l		0.100		10ml	50	
1.0 ug/l		0.500		10ml	50	
2.0 ug/l		1.000		10ml	50	
5.0 ug/l		2.500		10ml	50	
10.0 ug/l		5.000		10ml	50	
ICV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10 ml	50	
L204010-BLK1				0.31	50	
W.E. [illegible] 4/2/12 SPM1		(*)	(*)	0.32	50	
1204(3096-01				0.31	50	
L204010-DUP1				0.31	50	
MS1		0.500	1.0	0.31	50	

[illegible] 4/2/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1101430	4/2/12 1400
ICV/CCV/LCS	I.V. 1101427	↓

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

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

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

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 4/3/12
Start Time/Temp: 1720/95°
End Time/Temp: 1750/95°

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

Logbook # 1094
Prep Batch: L204020
Worksheet: HG040301
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
Blank						
0.2 ug/l						
1.0 ug/l						
2.0 ug/l						
5.0 ug/l						
10.0 ug/l						
ICV						
CCV						
ICB/CCB						
L204020-BLK1				0.33	50	
SRM1		(A)	(A)	0.32	50	
L204002-07				~~0.35~~ 0.34	50	PAD
L204020-DUP1				0.37	50	
MS1		0.500	1.0	0.37	50	
L204003-01				0.36	50	
L204020-DUP2				0.38	50	
MS2		0.500	1.0	0.37	50	

Deleted 06 pw 4/3/12

Curve digested with L204010 on 4/2/12 pw 4/3/12

pw 4/3/12

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1101430	4/3/12 0950
ICV/CCV/LCS	I.U 1101427	↓

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

se book # 9368 for std traceability information

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

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

ME-HgCVAA-Prep0910

Page #:

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PREPARATION BENCH SHEET

L204043

Lionville Laboratory

Printed: 4/6/2012 1:27:40PM

00000104

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
1204003-01	6010B ICP Trace	04/05/2012 09:41	0.61	50					WC-Hanford, Inc.	HSL + B, Mo, Si (no TL)
L204043-BLK1	QC	04/05/2012 09:41	0.62	50						
L204043-DUP1	QC	04/05/2012 09:41	0.56	50		1204003-01				
L204043-MS1	QC	04/05/2012 09:41	0.55	50	1200457	1204003-01	500			
L204043-SRM1	QC	04/05/2012 09:41	0.69	50	1101357		690			

JJS — Extracts Relinquished By — Date: 4/6/12

Rheeter — Extracts Received By — Date: 04/06/12

INORGANICS

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-228 Project Number: K3854 Project Manager: Joan Kessner	**Reported:** 04/24/2012 17:38

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NP18	1204003-01	Soil	03/29/2012 09:17	04/03/2012 10:10

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Case Narrative

Client: WC-HANFORD RC-228 K3854
LVL#: 1204003 **Date Received:** 04-03-12

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 me 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.

for

Iain Daniels
Laboratory Manager
Lionville Laboratory

4/24/12
Date

njp\i04-003

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

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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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Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1NP18 (1204003-01) Soil										
%Solids	**91.5**			0.1	% by Weight	1	L204034	04/05/2012	04/05/2012	SM2540G
Bromide	1.1	U	1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Chloride	**2.6**	B	1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Fluoride	1.1	U	1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Nitrate	**5.4**		1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Nitrite	1.1	U	1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Orthophosphate	2.2	U	2.2	10.8	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Sulfate	**16.0**		1.1	5.4	mg/kg dry	1	L204061	04/06/2012	04/06/2012	EPA 300.0 (1993)
Nitrate/Nitrite as N	**1.78**		0.10	0.52	mg/kg dry	1	L204067	04/11/2012	04/11/2012	EPA 353.2
Cyanide	0.52	U	0.52	1.04	mg/kg dry	1	L204062	04/06/2012	04/09/2012	SW846 9014
Sulfide	43.7	U	43.7	109	mg/kg dry	1	L204122	04/11/2012	04/11/2012	SW846 9034
pH	**8.69**		0.10	0.10	pH Units	1	L204038	04/04/2012	04/04/2012	SW846 9045D
%Moisture	**8.49**		0.10	0.10	% by Weight	1	L204035	04/05/2012	04/05/2012	D2216

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WC-Hanford, Inc.	Project: RC-228	
2620 Fermi Avenue	Project Number: K3854	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	04/24/2012 17:38

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204038 - Default Prep GenChem										
Duplicate (L204038-DUP1)	**Source: 1204003-01**			Prepared & Analyzed: 04/04/2012						
pH	8.77	0.10	0.10	pH Units		8.69			0.916	20
Reference (L204038-SRM1)				Prepared & Analyzed: 04/04/2012						
pH	7.05	0.10	0.10	pH Units	7.0000		101	99-101		
Batch L204061 - Default Prep GenChem										
Blank (L204061-BLK1)				Prepared & Analyzed: 04/06/2012						
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 (L204061-BS1)				Prepared & Analyzed: 04/06/2012						
Fluoride	50.8	1.0	5.0	mg/kg wet	50.000		102	80-120		20
Chloride	48.0	1.0	5.0	mg/kg wet	50.000		96.0	80-120		20
Bromide	49.5	1.0	5.0	mg/kg wet	50.000		99.0	80-120		20
Orthophosphate	49.0	2.0	10.0	mg/kg wet	50.000		98.0	80-120		20
Sulfate	49.9	1.0	5.0	mg/kg wet	50.000		99.8	80-120		20
Nitrate	49.1	1.0	5.0	mg/kg wet	50.000		98.2	80-120		20
Nitrite	49.4	1.0	5.0	mg/kg wet	50.000		98.8	80-120		20
Duplicate (L204061-DUP1)	**Source: 1204003-01**			Prepared & Analyzed: 04/06/2012						
Fluoride	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Chloride	2.5 B	1.1	5.3	mg/kg dry		2.6			1.47	20
Bromide	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20
Orthophosphate	2.1 U	2.1	10.6	mg/kg dry		2.2 U				20
Sulfate	15.9	1.1	5.3	mg/kg dry		16.0			0.127	20
Nitrate	5.3	1.1	5.3	mg/kg dry		5.4			1.47	20
Nitrite	1.1 U	1.1	5.3	mg/kg dry		1.1 U				20

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Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204061 - Default Prep GenChem										
Matrix Spike (L204061-MS1)	**Source: 1204003-01**			Prepared & Analyzed: 04/06/2012						
Fluoride	54.1	1.1	5.3	mg/kg dry	53.498	1.1 U	101	75-125		20
Chloride	54.7	1.1	5.3	mg/kg dry	53.498	2.6	97.4	75-125		20
Bromide	52.0	1.1	5.3	mg/kg dry	53.498	1.1 U	97.2	75-125		20
Orthophosphate	53.5	2.1	10.7	mg/kg dry	53.498	2.2 U	100	75-125		20
Sulfate	70.7	1.1	5.3	mg/kg dry	53.498	16.0	102	75-125		20
Nitrate	59.8	1.1	5.3	mg/kg dry	53.498	5.4	102	75-125		20
Nitrite	52.0	1.1	5.3	mg/kg dry	53.498	1.1 U	97.2	75-125		20
Batch L204062 - SW 9010B										
Blank (L204062-BLK1)				Prepared: 04/06/2012 Analyzed: 04/09/2012						
Cyanide	0.47 U	0.47	0.95	mg/kg wet						
LCS (L204062-BS1)				Prepared: 04/06/2012 Analyzed: 04/09/2012						
Cyanide	1.64	0.45	0.91	mg/kg wet	1.8126		90.7	80-120		
LCS (L204062-BS2)				Prepared: 04/06/2012 Analyzed: 04/09/2012						
Cyanide	8.82	0.46	0.91	mg/kg wet	9.1391		96.5	80-120		
Duplicate (L204062-DUP1)	**Source: 1204003-01**			Prepared: 04/06/2012 Analyzed: 04/09/2012						
Cyanide	0.52 U	0.52	1.05	mg/kg dry		0.52 U				20
Matrix Spike (L204062-MS1)	**Source: 1204003-01**			Prepared: 04/06/2012 Analyzed: 04/09/2012						
Cyanide	4.06	0.51	1.03	mg/kg dry	5.1372	0.52 U	79.0	75-125		
Batch L204067 - Default Prep GenChem										
Blank (L204067-BLK1)				Prepared & Analyzed: 04/11/2012						
Nitrate/Nitrite as N	0.12 B	0.10	0.49	mg/kg wet						

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Wet Chemistry - Quality Control
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Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L204067 - Default Prep GenChem										
LCS (L204067-BS1)				Prepared & Analyzed: 04/11/2012						
Nitrate/Nitrite as N	5.28	0.10	0.49	mg/kg wet	4.9456		107	90-110		20
Duplicate (L204067-DUP1)	**Source: 1204003-01**			Prepared & Analyzed: 04/11/2012						
Nitrate/Nitrite as N	1.71	0.11	0.54	mg/kg dry		1.78			3.76	20
Matrix Spike (L204067-MS1)	**Source: 1204003-01**			Prepared & Analyzed: 04/11/2012						
Nitrate/Nitrite as N	7.18	0.11	0.54	mg/kg dry	5.4385	1.78	99.3	75-125		
Batch L204122 - SW 9030B										
Blank (L204122-BLK1)				Prepared & Analyzed: 04/11/2012						
Sulfide	40.0 U	40.0	100	mg/kg wet						
LCS (L204122-BS1)				Prepared & Analyzed: 04/11/2012						
Sulfide	237	40.0	100	mg/kg wet	219.80		108	80-120		20
LCS (L204122-BS2)				Prepared & Analyzed: 04/11/2012						
Sulfide	253	40.0	100	mg/kg wet	219.63		115	80-120		20
Duplicate (L204122-DUP2)	**Source: 1204003-01**			Prepared & Analyzed: 04/11/2012						
Sulfide	43.7 U	43.7	109	mg/kg dry		43.7 U				20
Matrix Spike (L204122-MS2)	**Source: 1204003-01**			Prepared & Analyzed: 04/11/2012						
Sulfide	224	43.7	109	mg/kg dry	235.21	43.7 U	95.3	75-125		