SAF-RC-075
100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 10/2/12
INITIAL/DATE

COMMENTS:

SDG K3983 SAF RC-075

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Waste Site: 100-D-50:1 Emer Discharge Pipelines – N-OB

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
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Richmond, California 94804-3849
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September 25, 2012

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

Reference: **P.O. #S00W235A01**
Eberline Analytical S2-09-019-7009 SDG K3983

Dear Ms. Kessner:

Enclosed is the data report for two soil samples designated under SAF No. RC-075. The samples were received at Eberline Analytical on September 7, 2012. The samples were 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/

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3983 was composed of two soil samples designated under SAF No. RC-075 with a Project Designation of: 100-D/DR Burial Grounds & Remaining Sites – Soil Full Protocol.

The samples were received as stated on the chain-of-custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 25, 2012.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis, Low Level

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis, Low Level

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Isotopic Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analysis

No other problems were encountered during the course of the analyses.

2.6 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."

9/25/12

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 K3983

SDG	7009
Contact	Joseph Verville

Client	Hanford
Contract	No. S00W235A01
Case no	SDG_K3983

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

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

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Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	09/25/12

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

LAB SAMPLE SUMMARY

SDG 7009
Contact Joseph Verville

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S209019-01	J1R0V4	Emer Dischrg. Pipl.N-OB	SOIL		RC-075	RC-075-319	09/05/12 12:55
S209019-02	J1R1P5		SOIL		RC-075	RC-075-333	09/04/12 11:50
S209019-03	Lab Control Sample		SOIL		RC-075		
S209019-04	Method Blank		SOIL		RC-075		
S209019-05	Duplicate (S209019-01)	Emer Dischrg. Pipl.N-OB	SOIL		RC-075		09/05/12 12:55

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

SDG 7009
Contact Joseph Verville

QC SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

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
7009	RC-075-319	J1R0V4	SOIL	95.8	972 g		09/07/12	2	S209019-01	7009-001
	RC-075-333	J1R1P5	SOIL	99.3	1222 g		09/07/12	3	S209019-02	7009-002
		Method Blank	SOIL						S209019-04	7009-004
		Lab Control Sample	SOIL						S209019-03	7009-003
		Duplicate (S209019-01)	SOIL	95.8	972 g		09/07/12	2	S209019-05	7009-005

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

SDG 7009
Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
U	SOIL	Uranium, Isotopic in Solids	7733-040	8.0	2			1	1	1/1		
Beta Counting												
SR	SOIL	Total Strontium in Solids	7733-040	10.4	2			1	1	1/1		
Gamma Spectroscopy												
GAM	SOIL	Gamma Scan	7733-040	7.0	2			1	1	1/1		
Liquid Scintillation Counting												
C	SOIL	Carbon 14 in Solids	7733-040	10.0	2			1	1	1/1		
H	SOIL	Tritium in Solids	7733-040	10.0	2			1	1	1/1		
NI_L	SOIL	Nickel 63 in Solids	7733-040	11.2	2			1	1	1/1		

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

SDG 7009
Contact Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S209019-01	J1R0V4			7009-001	C		09/23/12	09/25/12	BW	Carbon 14 in Solids
09/05/12	Emer Dischrg. Pipl.N-OB		SOIL	7009-001	GAM		09/12/12	09/13/12	CSS	Gamma Scan
09/07/12	RC-075-319	RC-075		7009-001	H		09/23/12	09/25/12	BW	Tritium in Solids
				7009-001	NI_L		09/17/12	09/19/12	BW	Nickel 63 in Solids
				7009-001	SR		09/20/12	09/21/12	BW	Total Strontium in Solids
				7009-001	U		09/18/12	09/24/12	BW	Uranium, Isotopic in Solids
S209019-02	J1R1P5			7009-002	C		09/23/12	09/25/12	BW	Carbon 14 in Solids
09/04/12			SOIL	7009-002	GAM		09/12/12	09/13/12	CSS	Gamma Scan
09/07/12	RC-075-333	RC-075		7009-002	H		09/23/12	09/25/12	BW	Tritium in Solids
				7009-002	NI_L		09/17/12	09/19/12	BW	Nickel 63 in Solids
				7009-002	SR		09/20/12	09/21/12	BW	Total Strontium in Solids
				7009-002	U		09/18/12	09/24/12	BW	Uranium, Isotopic in Solids
S209019-03	Lab Control Sample			7009-003	C		09/24/12	09/25/12	BW	Carbon 14 in Solids
			SOIL	7009-003	GAM		09/13/12	09/13/12	CSS	Gamma Scan
		RC-075		7009-003	H		09/24/12	09/25/12	BW	Tritium in Solids
				7009-003	NI_L		09/17/12	09/19/12	BW	Nickel 63 in Solids
				7009-003	SR		09/20/12	09/21/12	BW	Total Strontium in Solids
				7009-003	U		09/18/12	09/24/12	BW	Uranium, Isotopic in Solids
S209019-04	Method Blank			7009-004	C		09/23/12	09/25/12	BW	Carbon 14 in Solids
			SOIL	7009-004	GAM		09/12/12	09/13/12	CSS	Gamma Scan
		RC-075		7009-004	H		09/23/12	09/25/12	BW	Tritium in Solids
				7009-004	NI_L		09/17/12	09/19/12	BW	Nickel 63 in Solids
				7009-004	SR		09/20/12	09/21/12	BW	Total Strontium in Solids
				7009-004	U		09/18/12	09/24/12	BW	Uranium, Isotopic in Solids
S209019-05	Duplicate (S209019-01)			7009-005	C		09/23/12	09/25/12	BW	Carbon 14 in Solids
09/05/12	Emer Dischrg. Pipl.N-OB		SOIL	7009-005	GAM		09/12/12	09/13/12	CSS	Gamma Scan
09/07/12		RC-075		7009-005	H		09/23/12	09/25/12	BW	Tritium in Solids
				7009-005	NI_L		09/17/12	09/19/12	BW	Nickel 63 in Solids
				7009-005	SR		09/20/12	09/21/12	BW	Total Strontium in Solids
				7009-005	U		09/18/12	09/24/12	BW	Uranium, Isotopic in Solids

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

SDG 7009
Contact Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	RC-075	Carbon 14 in Solids	C14LL_COX_LSC	2			1	1	1	5
GAM	RC-075	Gamma Scan	GAMMA_GS	2			1	1	1	5
H	RC-075	Tritium in Solids	TRITIUM_COX_LSC	2			1	1	1	5
NI_L	RC-075	Nickel 63 in Solids	NI63_LSC	2			1	1	1	5
SR	RC-075	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
U	RC-075	Uranium, Isotopic in Solids	UISO_PLATE_AEA	2			1	1	1	5
TOTALS				12			6	6	6	30

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

7009-004

Method Blank

METHOD BLANK

SDG	7009	Client/Case no	Hanford SDG_K3983
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S209019-04	Client sample id	Method Blank
Dept sample id	7009-004	Material/Matrix	SOIL
		SAF No	RC-075

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	1.09	1.7	2.88	10.0	U	H
Carbon 14	14762-75-5	-0.445	0.52	0.871	1.00	U	C
Nickel 63	13981-37-8	-0.983	1.9	3.34	30.0	U	NI_L
Total Strontium	SR-RAD	-0.016	0.13	0.236	1.00	U	SR
Uranium 233/234	U-233/234	0	0.011	0.034	1.00	U	U
Uranium 235	15117-96-1	-0.003	0.007	0.032	1.00	U	U
Uranium 238	U-238	-0.003	0.006	0.027	1.00	U	U
Potassium 40	13966-00-2	U		0.243		U	GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.100	U	GAM
Europium 152	14683-23-9	U		0.031	0.100	U	GAM
Europium 154	15585-10-1	U		0.047	0.100	U	GAM
Europium 155	14391-16-3	U		0.030	0.100	U	GAM
Radium 226	13982-63-3	U		0.025	0.100	U	GAM
Radium 228	15262-20-1	U		0.064	0.200	U	GAM
Thorium 228	14274-82-9	U		0.017		U	GAM
Thorium 232	TH-232	U		0.064		U	GAM
Uranium 235	15117-96-1	U		0.064	0.300	U	GAM
Uranium 238	U-238	U		1.78	10.0	U	GAM
Americium 241	14596-10-2	U		0.045	0.300	U	GAM

QC-BLANK #82526

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

7009-003 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7009 Client/Case no Hanford SDG K3983

Contact Joseph Verville Contract No. S00W235A01

Lab sample id S209019-03 Client sample id Lab Control Sample

Dept sample id 7009-003 Material/Matrix SOIL

SAF No RC-075

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	126	5.6	3.27	10.0		H	129	5.2	98	83-117	80-120
Carbon 14	1110	16	3.69	1.00		C	1060	42	105	83-117	80-120
Nickel 63	235	6.6	3.45	30.0		NI_L	258	10	91	83-117	80-120
Total Strontium	9.62	0.55	0.252	1.00		SR	9.25	0.37	104	81-119	80-120
Uranium 233/234	11.8	0.49	0.072	1.00		U	11.8	0.47	100	85-115	80-120
Uranium 238	11.5	0.48	0.070	1.00		U	11.8	0.47	97	86-114	80-120
Cobalt 60	0.523	0.046	0.019	0.050		GAM	0.492	0.020	106	81-119	80-120
Cesium 137	0.544	0.043	0.029	0.100		GAM	0.582	0.023	93	84-116	80-120

QC-LCS#82525

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

7009-005 J1R0V4

DUPLICATE

SDG	7009			Client/Case no	Hanford SDG K3983
Contact	Joseph Verville			Contract	No. S00W235A01
	DUPLICATE		ORIGINAL		
Lab sample id	S209019-05	Lab sample id	S209019-01	Client sample id	J1R0V4
Dept sample id	7009-005	Dept sample id	7009-001	Location/Matrix	Emer Dischrg. Pipl.N-OB SOIL
		Received	09/07/12	Collected/Weight	09/05/12 12:55 972 g
% solids	95.8	% solids	95.8	Custody/SAF No	RC-075-319 RC-075

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	1.27	1.8	3.05	10.0	U	H	4.64	2.1	3.10		114	142	2.4
Carbon 14	1.26	0.59	0.955	1.00		C	0.815	0.57	0.933	U	43	121	1.1
Nickel 63	-1.13	2.0	3.55	30.0	U	NI_L	-1.69	2.0	3.62	U	-		0.4
Total Strontium	0.019	0.14	0.244	1.00	U	SR	0.029	0.15	0.248	U	-		0.1
Uranium 233/234	0.453	0.073	0.037	1.00		U	0.444	0.074	0.034		2	39	0.2
Uranium 235	0.030	0.020	0.026	1.00		U	0.030	0.020	0.026		0	142	0
Uranium 238	0.506	0.079	0.031	1.00		U	0.452	0.074	0.031		11	38	0.9
Potassium 40	13.4	0.60	0.216			GAM	12.2	0.56	0.305		9	18	1.6
Cobalt 60	U		0.024	0.050	U	GAM	U		0.024	U	-		0
Cesium 137	U		0.028	0.100	U	GAM	U		0.024	U	-		0.2
Europium 152	U		0.072	0.100	U	GAM	U		0.062	U	-		0.2
Europium 154	U		0.086	0.100	U	GAM	U		0.080	U	-		0.1
Europium 155	U		0.090	0.100	U	GAM	U		0.083	U	-		0.1
Radium 226	0.430	0.057	0.052	0.100		GAM	0.462	0.050	0.044		7	30	0.7
Radium 228	0.764	0.094	0.086	0.200		GAM	0.731	0.11	0.090		4	33	0.4
Thorium 228	0.701	0.042	0.036			GAM	0.688	0.039	0.035		2	19	0.3
Thorium 232	0.764	0.094	0.086			GAM	0.731	0.11	0.090		4	33	0.4
Uranium 235	U		0.175	0.300	U	GAM	U		0.148	U	-		0.2
Uranium 238	U		2.90	10.0	U	GAM	U		2.72	U	-		0.1
Americium 241	U		0.117	0.300	U	GAM	U		0.142	U	-		0.3

QC-DUP#1 82527

100-D/DR Burial Grounds & Remaining Sites-
Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

7009-001 J1R0V4

DATA SHEET

SDG	7009	Client/Case no	Hanford SDG_K3983
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S209019-01	Client sample id	J1R0V4
Dept sample id	7009-001	Location/Matrix	Emer Dischrg. Pipl.N-OB SOIL
Received	09/07/12	Collected/Weight	09/05/12 12:55 972 g
% solids	95.8	Custody/SAF No	RC-075-319 RC-075

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	4.64	2.1	3.10	10.0		H
Carbon 14	14762-75-5	0.815	0.57	0.933	1.00	U	C
Nickel 63	13981-37-8	-1.69	2.0	3.62	30.0	U	NI_L
Total Strontium	SR-RAD	0.029	0.15	0.248	1.00	U	SR
Uranium 233/234	U-233/234	0.444	0.074	0.034	1.00		U
Uranium 235	15117-96-1	0.030	0.020	0.026	1.00		U
Uranium 238	U-238	0.452	0.074	0.031	1.00		U
Potassium 40	13966-00-2	12.2	0.56	0.305			GAM
Cobalt 60	10198-40-0	U		0.024	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.100	U	GAM
Europium 152	14683-23-9	U		0.062	0.100	U	GAM
Europium 154	15585-10-1	U		0.080	0.100	U	GAM
Europium 155	14391-16-3	U		0.083	0.100	U	GAM
Radium 226	13982-63-3	0.462	0.050	0.044	0.100		GAM
Radium 228	15262-20-1	0.731	0.11	0.090	0.200		GAM
Thorium 228	14274-82-9	0.688	0.039	0.035			GAM
Thorium 232	TH-232	0.731	0.11	0.090			GAM
Uranium 235	15117-96-1	U		0.148	0.300	U	GAM
Uranium 238	U-238	U		2.72	10.0	U	GAM
Americium 241	14596-10-2	U		0.142	0.300	U	GAM

100-D/DR Burial Grounds & Remaining Sites-
Soil Full Protocol

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

7009-002 J1R1P5

DATA SHEET

SDG	7009	Client/Case no	Hanford SDG_K3983
Contact	Joseph Verville	Contract	No. S00W235A01
Lab sample id	S209019-02	Client sample id	J1R1P5
Dept sample id	7009-002	Location/Matrix	SOIL
Received	09/07/12	Collected/Weight	09/04/12 11:50 1222 g
% solids	99.3	Custody/SAF No	RC-075-333 RC-075

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	2.30	1.9	3.12	10.0	U	H
Carbon 14	14762-75-5	1.80	0.82	1.33	1.00		C
Nickel 63	13981-37-8	-1.72	1.8	3.26	30.0	U	NI_L
Total Strontium	SR-RAD	0.025	0.13	0.235	1.00	U	SR
Uranium 233/234	U-233/234	0.484	0.080	0.047	1.00		U
Uranium 235	15117-96-1	0.033	0.022	0.035	1.00	U	U
Uranium 238	U-238	0.466	0.080	0.037	1.00		U
Potassium 40	13966-00-2	10.5	0.43	0.179			GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	U		0.016	0.100	U	GAM
Europium 152	14683-23-9	U		0.048	0.100	U	GAM
Europium 154	15585-10-1	U		0.052	0.100	U	GAM
Europium 155	14391-16-3	U		0.067	0.100	U	GAM
Radium 226	13982-63-3	0.367	0.035	0.032	0.100		GAM
Radium 228	15262-20-1	0.577	0.074	0.070	0.200		GAM
Thorium 228	14274-82-9	0.576	0.028	0.024			GAM
Thorium 232	TH-232	0.577	0.074	0.070			GAM
Uranium 235	15117-96-1	U		0.108	0.300	U	GAM
Uranium 238	U-238	U		2.08	10.0	U	GAM
Americium 241	14596-10-2	U		0.033	0.300	U	GAM

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test U Matrix SOIL
SDG 7009
Contact Joseph Verville

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A01
Contract SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 7733-040											
S209019-01			7009-001	J1R0V4	0.444	0.030	0.452	98	23	7	5
S209019-02			7009-002	J1R1P5	0.484	U	0.466	104	25	7	5
S209019-03			7009-003	Lab Control Sample	ok		ok				
S209019-04			7009-004	Method Blank	U	U	U				
S209019-05			7009-005	Duplicate (S209019-01)	ok	ok	ok	90	20	6	4
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	1.00	100		4	
							Averages	97		7	

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 7733-040			2σ prep error 8.0 % Reference Lab Notebook 7733-040													
S209019-01			J1R0V4	0.034	0.500			98		890			13	09/18/12	09/18	SS-013
S209019-02			J1R1P5	0.047	0.500			88		890			14	09/18/12	09/18	SS-014
S209019-03			Lab Control Sample	0.072	0.500			93		890				09/18/12	09/18	SS-015
S209019-04			Method Blank	0.034	0.500			87		890				09/18/12	09/18	SS-016
S209019-05			Duplicate (S209019-01)	0.037	0.500			89		887			13	09/18/12	09/18	SS-030
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.045 ± 0.032
YIELD 91 ± 9

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test	SR
Matrix	SOIL
SDG	7009
Contact	Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium	
Preparation batch 7733-040						
S209019-01			7009-001	J1R0V4	U	
S209019-02			7009-002	J1R1P5	U	
S209019-03			7009-003	Lab Control Sample	ok	
S209019-04			7009-004	Method Blank	U	
S209019-05			7009-005	Duplicate (S209019-01)	-	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 7733-040			2σ prep error 10.4 % Reference Lab Notebook 7733-040													
S209019-01			J1R0V4	0.248	1.00			89		177			15	09/20/12	09/20	GRB-229
S209019-02			J1R1P5	0.235	1.00			89		177			16	09/20/12	09/20	GRB-230
S209019-03			Lab Control Sample	0.252	1.00			91		100				09/20/12	09/20	GRB-225
S209019-04			Method Blank	0.236	1.00			92		177				09/20/12	09/20	GRB-231
S209019-05			Duplicate (S209019-01)	0.244	1.00			85		177			15	09/20/12	09/20	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	0.243	±	0.015
FOR 5 SAMPLES	YIELD	89	±	5

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test	GAM
Matrix	SOIL
SDG	7009
Contact	Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60		Cesium 137	
Preparation batch 7733-040								
S209019-01			7009-001	J1R0V4	U		U	
S209019-02			7009-002	J1R1P5	U		U	
S209019-03			7009-003	Lab Control Sample	ok		ok	
S209019-04			7009-004	Method Blank	U		U	
S209019-05			7009-005	Duplicate (S209019-01)	-	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 7733-040			2σ prep error 7.0 %	Reference Lab Notebook 7733-040												
S209019-01			J1R0V4	0.199	571					131			7	09/11/12	09/12	MB,08,00
S209019-02			J1R1P5	0.130	885					131			8	09/11/12	09/12	MB,06,00
S209019-03			Lab Control Sample	0.019	500					133				09/11/12	09/13	01,04,00
S209019-04			Method Blank	0.125	500					130				09/11/12	09/12	01,04,00
S209019-05			Duplicate (S209019-01)	0.188	571					101			7	09/11/12	09/12	02,02,00
Nominal values and limits from method				0.050	500					100			180			

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

AVERAGES ± 2 SD FOR 5 SAMPLES	MDA	0.132 ±	0.143
	YIELD	±	

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test	C
Matrix	SOIL
SDG	7009
Contact	Joseph Verville

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14
Preparation batch 7733-040					
S209019-01			7009-001	J1R0V4	U
S209019-02			7009-002	J1R1P5	1.80
S209019-03			7009-003	Lab Control Sample	ok
S209019-04			7009-004	Method Blank	U
S209019-05			7009-005	Duplicate (S209019-01)	ok
Nominal values and limits from method				RDLs (pCi/g)	1.00

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7733-040			2σ prep error 10.0 %	Reference Lab Notebook 7733-040												
S209019-01			J1R0V4	0.933	0.630			100		320			18	09/20/12	09/23	LSC-004
S209019-02			J1R1P5	1.33	0.635			100		320			19	09/20/12	09/23	LSC-004
S209019-03			Lab Control Sample	3.69	0.600			100		19				09/20/12	09/24	LSC-004
S209019-04			Method Blank	0.871	0.600			100		320				09/20/12	09/23	LSC-004
S209019-05			Duplicate (S209019-01)	0.955	0.634			100		320			18	09/20/12	09/23	LSC-004
Nominal values and limits from method				1.00	0.600					50			180			

PROCEDURES	REFERENCE	C14LL_COX_LSC
	CP-251	Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD	MDA	1.56	± 2.41
FOR 5 SAMPLES	YIELD	100	± 0

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test	H
Matrix	SOIL
SDG	7009
Contact	Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7733-040						
S209019-01			7009-001	J1R0V4	4.64	
S209019-02			7009-002	J1R1P5	U	
S209019-03			7009-003	Lab Control Sample	ok	
S209019-04			7009-004	Method Blank	U	
S209019-05			7009-005	Duplicate (S209019-01)	ok	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 7733-040			2σ prep error 10.0 %	Reference Lab Notebook 7733-040												
S209019-01			J1R0V4	3.10	0.630			100		50			18	09/20/12	09/23	LSC-006
S209019-02			J1R1P5	3.12	0.635			100		50			19	09/20/12	09/23	LSC-006
S209019-03			Lab Control Sample	3.27	0.600			100		50				09/20/12	09/24	LSC-006
S209019-04			Method Blank	2.88	0.600			100		50				09/20/12	09/23	LSC-006
S209019-05			Duplicate (S209019-01)	3.05	0.634			100		50			18	09/20/12	09/23	LSC-006
Nominal values and limits from method				10.0	0.600					50			180			

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

AVERAGES ± 2 SD	MDA	3.08	± 0.281
FOR 5 SAMPLES	YIELD	100	± 0

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/25/12

EBERLINE ANALYTICAL-RICHMOND

SAMPLE DELIVERY GROUP K3983

Test	NI L
Matrix	SOIL
SDG	7009
Contact	Joseph Verville

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client	Hanford
Contract	No. S00W235A01
Contract	SDG K3983

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7733-040						
S209019-01			7009-001	J1R0V4	U	
S209019-02			7009-002	J1R1P5	U	
S209019-03			7009-003	Lab Control Sample	ok	
S209019-04			7009-004	Method Blank	U	
S209019-05			7009-005	Duplicate (S209019-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	30.0	

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 7733-040			2σ prep error 11.2 %	Reference Lab Notebook 7733-040												
S209019-01			J1R0V4	3.62	0.500			84		50			12	09/17/12	09/17	LSC-006
S209019-02			J1R1P5	3.26	0.500			92		50			13	09/17/12	09/17	LSC-006
S209019-03			Lab Control Sample	3.45	0.500			89		50				09/17/12	09/17	LSC-006
S209019-04			Method Blank	3.34	0.500			92		50				09/17/12	09/17	LSC-006
S209019-05			Duplicate (S209019-01)	3.55	0.500			84		50			12	09/17/12	09/17	LSC-006
Nominal values and limits from method				30.0	0.500			40-110		20			180			

PROCEDURES	REFERENCE	NI63_LSC
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-281	Nickel-63 Purification By Extraction Chromatography, rev 5

AVERAGES ± 2 SD	MDA	3.44	± 0.295
FOR 5 SAMPLES	YIELD	88	± 8

Lab id	EBRLNE
Protocol	RC-075
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/25/12

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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

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

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

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 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

WORK SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3983

DATA SHEET

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

The following notes apply to this report:

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

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

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

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

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

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

The following qualifiers are defined by the DVD system:

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

Lab id EBRLNE
Protocol RC-075
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DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

SDG 7009
Contact Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A01
Case no SDG_K3983

DATA SHEET

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

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

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

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG_K3983

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

  This value reported for this limit is at most 999.

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

  1. A fixed percentage specified in the protocol.

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

DUPLICATE

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

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

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

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

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

SDG 7009
Contact Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A01
Case no SDG K3983

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

Lab id EBRLNE
Protocol RC-075
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/25/12

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.

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

  MDAs are underlined if greater than the printed RDL.

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-075-333	Page 1 of 1

Collector Smith J	Company Contact J Kessner	Telephone No. 509-375-4688 (7009)	Project Coordinator KESSNER, JH
Price Code ~~8L~~ 8L ~~B3~~	Data Turnaround ~~21~~ 21 Days		
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Soil Full Prot	Sampling Location 100-D-50:1 Emer Discharge Pipelines- N-OB K3983		SAF No. RC-075
Ice Chest No. WCH-11-025	Field Logbook No. EL-1607-14	COA R00D502000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES/ LIONVILLE	Offsite Property No. A110548		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential Rad <DOT~~ DWS 9/6/12

Special Handling and/or Storage

~~Cool 4 Deg C~~ NONE

A# 8-5-12

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	125mL	125mL	120mL	125mL	120mL	125mL	500mL	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2; pH (Soil) - 9045	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Carbon-14 Low Level; Tritium - H3 Low Level Soil	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Uranium

Sample No.	Matrix *	Sample Date	Sample Time										
J1R1P5	SOIL	9-4-12	1150							X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From Jason Smith	Date/Time 9/4/12 1305	Received By/Stored In WCH MZ MStankovich	Date/Time 1305 9/4/12
Relinquished By/Removed From WCH MZ MStankovich	Date/Time 1525 9/4/12	Received By/Stored In 1060 #1 DWSHEA	Date/Time 9/4/12 1525
Relinquished By/Removed From DWSHEA	Date/Time 9/5/12 0938	Received By/Stored In 1060 #1 A. Freier	Date/Time 0938 9-5-12
Relinquished By/Removed From 1060 #1 A. Freier	Date/Time 0815 9-6-12 WCH	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From FED EX	Date/Time	Received By/Stored In M DEATRAWMAN	Date/Time 09/07/12 1530
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(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) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY DWSHEA DATE 9/6/12

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

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-075-319	Page ~~3 of 3~~ AJ 9-5-12

Collector: J Smith	Company Contact: J Kessner; Telephone No.: 509-375-4688 (7009)	Project Coordinator: KESSNER, JH	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100-D/DR Burial Grounds & Remaining Sites - Soil Full Prot	Sampling Location: 100-D-50:1 Emer Discharge Pipelines- Excavation K3983	SAF No.: RC-075	
Ice Chest No.: WCH-11-025	Field Logbook No.: EL-1607-14; COA: R00D502000	Method of Shipment: Fed Ex	
Shipped To: EBERLINE SERVICES / LIONVILLE	Offsite Property No.: A110548	Bill of Lading/Air Bill No.: See OSPC	

POSSIBLE ~~SAMPLE~~ HAZARDS/REMARKS
~~Potential Rad <DOT~~ MS 9/5/12

Special Handling and/or Storage
~~Cool 4 Deg C~~ NONE AJ 9-6-12

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	125mL	125mL	120mL	125mL	120mL	125mL	500mL	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2; pH (Soil) - 9045	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Carbon-14 Low Level; Tritium - H3 Low Level Soil	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Uranium

AJ 9-5-12

Sample No.	Matrix *	Sample Date	Sample Time										
~~J1R0V2~~ AJ 9-5-12	SOIL												
J1R0V3	~~SOIL~~												
J1R0V4	SOIL	9/5/12	1255							X	X	X	X
~~J1R0V5~~ AJ 9-5-12	~~SOIL~~												

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: Jason Smith	9/5/12 17:33	Received By/Stored In: WCH MSTankovich	9/5/12 1255
Relinquished By/Removed From: MSTankovich	9/5/12 1420	Received By/Stored In: 1060 #1 A. Freier	1420 9-5-12
Relinquished By/Removed From: 1060#1 A. Freier	Date/Time 0815 9-6-12 WCH	Received By/Stored In: Fed Ex	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time	Received By/Stored In: F. Hartman	Date/Time 09/07/12 1530
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(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) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY Dwshea DATE 9/6/12

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

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W. C. HANFORD City RICHLAND State WA

Date/Time received 09/07/12 1530 CoC No. RC-075-319,333

Container I.D. No. WCH-11-025 Requested TAT (Days) 21 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 2 Sample Matrix S
7. Number of containers per sample: 4 (Or see CoC _____)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH N/A Preservative _____
13. Describe any anomalies:
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by [signature] Date: 09/10/12 Time: 0745

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

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 150482 Calibration date 06 DEC 11

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

28 September 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 #	1209022
SDG #	K3983
SAF #	RC-075
Date Received	09/07/12
# Samples	2
Matrix	SOIL
Volatiles	
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
PAHs	
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 75 pages.

CHAIN OF CUSTODY

Lionville Laboratory Use Only

1209022

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 W.C. Hanford SAF# RC-075

Est. Final Proj. Sampling Date

Project#

Project Contact/Phone#

Lionville Laboratory Project Manager Roberta Johnson

QC Std Del SW TAT 21 Days

Date Rec'd 9.7.12 Date Due 9-28-12

		A	B		C			D		E	F				
Refrigerator #		1	1		1			1		1	1				
#/Type Container	Liquid														
	Solid	1aql	1aql		1aql			1aql		1aql	1aql				
Volume	Liquid														
	Solid	125	125		120			125		125	120				
Preservatives		—	—		—			—		—	—				
ANALYSES REQUESTED		ORGANIC						INORG							
		VOA	BNA	Pest/PCB	Herb	PCBs		(1) Metal + Hg	CN	Cr+6	ic Anions	NO2/NO3			
								Lionville Laboratory Use Only							
			TCL 8270	Pest		PCB		METALS		Cr6	anions	N3N2 pH			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
W Water	01	J1R1P5			S	9.4.12	1150		X	X		X			X		X	X	X		
WW Waste Water	02	J1R0V4			↓	9.5.12	1255		X	X		X			X		X	X	X		
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																					

Special Instructions:

METALS = HSL + B, Mo, Si (NoTl)

Special Instructions:

1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[illegible]	9-7-12	15:25

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

0000000003

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-075-333	Page 1 of 1

Collector Smith J	Company Contact J Kessner	Telephone No. 509-375-4688	Project Coordinator KESSNER, JH
Price Code ~~8L~~ 8L ~~8B~~	Data Turnaround ~~21~~ 7 Days AJ 9-6-12		
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Soil Full Prot	Sampling Location 100-D-50:1 Emer Discharge Pipelines- N-OB		SAF No. RC-075
Ice Chest No. WCH-11-061	Field Logbook No. EL-1607-14	COA R00D502000	Method of Shipment Fed Ex
Shipped To EBERLINE SERVICES, LIONVILLE	Offsite Property No. A110525		Bill of Lading/Air Bill No. See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
~~Potential Rad <DOT~~ DWShea 9/6/12

Special Handling and/or Storage
Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	125mL	125mL	120mL	125mL	120mL	125mL	500mL	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2; pH (Soil) - 9045	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Carbon-14 Low Level; Tritium - H3 Low Level Soil	Nickel-63; Strontium-90 -- Total Sr	Isotopic Uranium
Sample No. / Matrix * / Sample Date / Sample Time										
J1R1P5 / SOIL / 9-4-12 / 1150	X	X	X	X	X	X		X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Jason Smith JSP	9/4/12 1305	WCH MStankovich	9/4/12 1305
WCH MStankovich	9/4/12 1525	1060#1 DWSHEA	9/4/12 1525
DWSHEA DWSHEA	9/5/12 0938	1060#1 A. Freier	9-5-12 0938
1060#1 A. Freier	9-6-12 1000	WCH Fed Ex	
Fed Ex	9.7.12 1525	Jason Smith	9.7.12 1525

SPECIAL INSTRUCTIONS

(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) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

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

REVIEWED BY DWShea DATE 9/6/12

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

WCH-EE-011

0000000004

1 of 1

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-075-319	Page 3 of 3 AJ 9-5-12

Collector: J Smith	Company Contact: J Kessner	Telephone No.: 509-375-4688	Project Coordinator: KESSNER, JH
Price Code: 8L	Data Turnaround: 21 Days		
Project Designation: 100-D/DR Burial Grounds & Remaining Sites - Soil Full Prot	Sampling Location: 100-D-50:1 Emer Discharge Pipelines- Excavation		SAF No.: RC-075
Ice Chest No.: WCH-11-061	Field Logbook No.: EL-1607-14	COA: R00D502000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES, LIONVILLE	Offsite Property No.: A110525		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

~~Potential Rad~~ <DOT no 9/5/12

Special Handling and/or Storage

Cool 4 Deg C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None	None	None
Type of Container	G/P	G/P	G/P	aG	aG	aG	G/P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	AJ 9-5-12	1	1
Volume	125mL	125mL	120mL	125mL	120mL	125mL	500mL	60mL	60mL	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	IC Anions - 300.0; NO2/NO3 - 353.2; pH (Soil) - 9045	Semi-VOA - 8270A (TCL)	PCBs - 8082	Pesticides - 8081	See item (2) in Special Instructions.	Carbon-14 Low Level; Tritium - H3 Low Level Soil	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Uranium

Sample No.	Matrix *	Sample Date	Sample Time										
J1R0V2	SOIL AJ	9-5-12											
J1R0V3	SOIL												
J1R0V4	SOIL	9/5/12	1255	X	X	X	X	X	X				
~~J1R0V5~~	~~SOIL~~	AJ 9-5-12											

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Jason Smith	9/5/12 12:33	WCH MSTankovich	9/5/12 1255
MSTankovich	9/5/12 1420	1060#1 A. Freier	9-5-12 1420
WCH A. Freier	1060#1 9-6-12 1000	Fed Ex	
Fed Ex	9-7-12 15:25		9-7-12 15:25

SPECIAL INSTRUCTIONS

(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) Gamma Spec (Client List) {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

REVIEWED BY MWSher DATE 9/6/12

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

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford
Project/SAF/SOW/Release #: RC-075

Date: 9-7-12

LvL Batch #: 1209022

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 7989 0779 9344
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 3.7	°C	Cooler # WCH-11-061
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 mgf 9-21-12	☑ No	NO2, NO3, PO4 past hold
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes mgf 9-21-12	☑ No	See #12
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A

Person Contacted _____ Date _____

SR-002-B.doc

SEMIVOLATILES

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

WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

Analytical Report for Semivolatile Organic Compounds by SW846 8270C

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R1P5	1209022-01	Soil	09/04/2012 11:50	09/07/2012 15:25
J1R0V4	1209022-02	Soil	09/05/2012 12:55	09/07/2012 15:25

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-075 K3983
LVL #: 1209022

W.O. #: 60049-001-001-0001-00
Date Received: 09-07-2012

SEMIVOLATILE

Two (2) soil samples were collected on 09-04,05-2012.

The samples and associated QC samples were extracted 09-10-2012 and analyzed 09-11-2012 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 samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

2. Samples were extracted and analyzed within holding time.

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

4. All obtainable surrogate recoveries were within acceptance criteria.

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

6. One (1) of sixty-four (64) blank spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR#12MS166) has been enclosed.

7. One (1) of one hundred and twenty-eight (128) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 12MS166) has been enclosed.

8. The samples were reported on a dry weight basis.

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

9. All initial calibrations associated with this data set were within acceptance criteria. Per method 8000B/8270C, the attached Table 1 shows the target compounds where the RSD exceeded 15%, and the mean RSD was used for evaluation of the initial calibration. Results associated with these compounds are considered to have greater uncertainty. Refer to the Analysis Batch Sequence Summary Forms to associate the calibration with client samples.

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

11. The GCMS tuning standard, analyzed on 09-11-2012 on instrument 5972D, used to assess GC column performance and injection port inertness exceeded the 20% acceptance criteria for the degradation of DDT to DDE and DDD. The degradation was not excessive (27.3%) and poor chromatography was not noted. All other tuning criteria standard analyzed after the tune were within the acceptance criteria. No chromatography anomalies were found with the CCV or the associated samples. The instrument was judged to be functioning properly and all surrogates/spikes were within QC acceptance criteria for the samples associated with this tune with the exception of 2,4-dinitrophenol in the MSD (MS was within criteria) and BS. This compound is subject to erratic chromatographic behavior. No target compounds were found in the samples; consequently the samples were not reanalyzed.

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

9/18/12
Date

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 12-MS166

Initiator: Sharon Saylor
Date: 9-13-12
Client: WC Hanford

Batch: 1209022
Samples: L209064-MS1
Method: (SW846)/MCAWW/CLP/

Parameter: 8270 C
Matrix: SOLID
Prep Batch: L209064

1. Reason for SDR

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

b. General Discrepancy

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

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

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

low recovery of 2,4-dinitrophenol in L209064-MS1 and L209064-MSD1 but L209064-MS1 is ok

9/17/12

2. Known or Probable Causes(s) acidiphenols are subject to erratic chromatographic behavior.

3. Discussion and Proposed Action Other Description:

narrate

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

4. Project Manager Instructions...signature/date: 9/18/12

__ 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: 9/18/12 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

TABLE 1

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

MEAN RSD USED FOR EVALUATION: 7.57 CALIBRATION: 1209018

>15% RSD	Compound	>15% RSD	Compound	>15% RSD	Compound
	1,2,4-Trichlorobenzene		Di-n-butyl Phthalate		Surrogates:
	1,2-Dichlorobenzene	✓	Di-n-octyl Phthalate		2-Fluorophenol
	1,3-Dichlorobenzene		Fluoranthene		Phenol-d5
	1,4-Dichlorobenzene		Fluorene		Nitrobenzene-d5
	2,4,5-Trichlorophenol		Hexachlorobenzene		2-Fluorobiphenyl
	2,4,6-Trichlorophenol		Hexachlorobutadiene		2,4,6-Tribromophenol
	2,4-Dichlorophenol	✓	Hexachlorocyclopentadiene		p-Terphenyl-d14
	2,4-Dimethylphenol		Hexachloroethane		
✓	2,4-Dinitrophenol		Indeno[1,2,3-cd]pyrene		
	2,4-Dinitrotoluene		Isophorone		
	2,6-Dinitrotoluene		Naphthalene		
	2-Chloronaphthalene		Nitrobenzene		
	2-Chlorophenol		N-Nitrosodi-n-propylamine		
	2-Methylnaphthalene		N-Nitrosodiphenylamine		
	2-Methylphenol	✓	Pentachlorophenol		
	2-Nitroaniline		Phenanthrene		
	2-Nitrophenol		Phenol		
	3- and/or 4-Methylphenol		Pyrene		
	3,3'-Dichlorobenzidine				
	3-Nitroaniline				
✓	4,6-Dinitro-2-methylphenol		**OLM04.2 TCL addons:**		
	4-Bromophenyl Phenyl Ether		1,1-Biphenyl		
	4-Chloro-3-methylphenol		Atrazine		
	4-Chloroaniline		Benzaldehyde		
	4-Chlorophenyl Phenyl Ether		Caprolactam		
	4-Nitroaniline				
	4-Nitrophenol		**NonTCL addons:**		
	Acenaphthene		1,2-Diphenylhydrazine		
	Acenaphthylene		1,4-Dioxane		
	Anthracene		1-Methylnapthalene		
	Benz[a]anthracene		2,3,4,6-Tetrachlorophenol		
	Benzo[a] pyrene		Acetophenone		
	Benzo[b] fluoranthene		Aniline		
	Benzo[g,h,i] perylene		Benzidine		
	Benzo[k] fluoranthene		Benzoic Acid		
	Benzyl alcohol		N-Nitrosodimethylamine		
	Bis(2-chloroethoxy) methane		Pyridine		
	Bis(2-chloroethyl) ether		Tributylphosphate		
	Bis(2-chloroisopropyl) ether				
	Bis(2-ethylhexyl) phthalate				
	Butyl Benzyl Phthalate				
	Carbazole				
	Chrysene				
	Dibenz[a,h]anthracene				
	Dibenzofuran				
	Diethyl Phthalate				
	Dimethyl Phthalate				

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K3983
Client:	WC-Hanford, Inc.	Project:	RC-075
Sequence:	2090058	Instrument:	HP5972D
Matrix:	Solid	Calibration:	1209018

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2090058-TUN1	D091001.D	09/10/12 09:05
Cal Standard	2090058-CAL5	D091002.D	09/10/12 09:28
Cal Standard	2090058-CAL1	D091003.D	09/10/12 10:13
Cal Standard	2090058-CAL2	D091004.D	09/10/12 10:58
Cal Standard	2090058-CAL3	D091005.D	09/10/12 11:43
Cal Standard	2090058-CAL4	D091006.D	09/10/12 12:28
Secondary Cal Check	2090058-SCV1	D091007.D	09/10/12 13:16

ANALYSIS BATCH (SEQUENCE) SUMMARY
8270C

Laboratory:	Lionville Laboratory	SDG:	K3983
Client:	WC-Hanford, Inc.	Project:	RC-075
Sequence:	2090060	Instrument:	HP5972D
Matrix:	Solid	Calibration:	1209018

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	2090060-TUN1	D091101.D	09/11/12 12:00
Calibration Check	2090060-CCV1	D091102.D	09/11/12 12:22
LCS	L209064-BS1	D091103.D	09/11/12 13:29
Blank	L209064-BLK1	D091104.D	09/11/12 14:14
J1R1P5	1209022-01	D091105.D	09/11/12 14:59
J1R1P5	L209064-MS1	D091106.D	09/11/12 15:45
J1R1P5	L209064-MSD1	D091107.D	09/11/12 16:30
J1R0V4	1209022-02	D091108.D	09/11/12 17:15

GLOSSARY

DATA QUALIFIERS

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

GLOSSARY

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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

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

WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R1P5
1209022-01 (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	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,2-Dichlorobenzene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,3-Dichlorobenzene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,4-Dichlorobenzene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4,5-Trichlorophenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4,6-Trichlorophenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dichlorophenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dimethylphenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dinitrophenol	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dinitrotoluene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,6-Dinitrotoluene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Chloronaphthalene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Chlorophenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Methylnaphthalene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Methylphenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Nitroaniline	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Nitrophenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3,3'-Dichlorobenzidine	648	U	648	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3-Nitroaniline	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4,6-Dinitro-2-methylphenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Bromophenyl Phenyl Ether	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chloro-3-methylphenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chloroaniline	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chlorophenyl Phenyl Ether	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3- and/or 4-Methylphenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Nitroaniline	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Nitrophenol	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Acenaphthene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Acenaphthylene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Anthracene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benz[a]anthracene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[a] pyrene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[b] fluoranthene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[g,h,i] perylene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[k] fluoranthene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-chloroethoxy) methane	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R1P5
1209022-01 (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	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-chloroisopropyl) ether	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-ethylhexyl) phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Butyl Benzyl Phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Carbazole	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Chrysene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dibenz[a,h]anthracene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dibenzofuran	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Diethyl Phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dimethyl Phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Di-n-butyl Phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Di-n-octyl Phthalate	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Fluoranthene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Fluorene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorobenzene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorobutadiene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorocyclopentadiene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachloroethane	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Indeno[1,2,3-cd]pyrene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Isophorone	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Naphthalene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Nitrobenzene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
N-Nitrosodi-n-propylamine	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
N-Nitrosodiphenylamine	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Pentachlorophenol	1620	U	1620	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Phenanthrene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Phenol	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Pyrene	324	U	324	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Trichloro-1-propene	**334**	B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Unknown 1	**359**	B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Aldol Condensate 3	**37300**	A, B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Aldol Condensate 2	**525**	A, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Aldol Condensate 1	**338**	A, B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Surrogate: 2-Fluorophenol	*59 %*		*25-121*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: Phenol-d5	*67 %*		*24-113*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*62 %*		*23-120*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R1P5
1209022-01 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*66 %*	*30-115*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*61 %*	*19-122*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*88 %*	*18-137*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R0V4

1209022-02 (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	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,2-Dichlorobenzene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,3-Dichlorobenzene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
1,4-Dichlorobenzene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4,5-Trichlorophenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4,6-Trichlorophenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dichlorophenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dimethylphenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dinitrophenol	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,4-Dinitrotoluene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2,6-Dinitrotoluene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Chloronaphthalene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Chlorophenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Methylnaphthalene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Methylphenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Nitroaniline	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
2-Nitrophenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3,3'-Dichlorobenzidine	684	U	684	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3-Nitroaniline	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4,6-Dinitro-2-methylphenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Bromophenyl Phenyl Ether	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chloro-3-methylphenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chloroaniline	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Chlorophenyl Phenyl Ether	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
3- and/or 4-Methylphenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Nitroaniline	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
4-Nitrophenol	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Acenaphthene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Acenaphthylene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Anthracene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benz[a]anthracene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[a] pyrene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[b] fluoranthene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[g,h,i] perylene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Benzo[k] fluoranthene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-chloroethoxy) methane	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R0V4
1209022-02 (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	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-chloroisopropyl) ether	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Bis(2-ethylhexyl) phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Butyl Benzyl Phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Carbazole	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Chrysene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dibenz[a,h]anthracene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dibenzofuran	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Diethyl Phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Dimethyl Phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Di-n-butyl Phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Di-n-octyl Phthalate	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Fluoranthene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Fluorene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorobenzene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorobutadiene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachlorocyclopentadiene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Hexachloroethane	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Indeno[1,2,3-cd]pyrene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Isophorone	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Naphthalene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Nitrobenzene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
N-Nitrosodi-n-propylamine	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
N-Nitrosodiphenylamine	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Pentachlorophenol	1710	U	1710	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Phenanthrene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Phenol	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Pyrene	342	U	342	ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Unknown 1	**369**	B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Trichloro-1-propene	**333**	B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Unknown 2	**196**	J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Aldol Condensate 2	**21500**	A, B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
TIC:Aldol Condensate 1	**646**	A, B, J		ug/kg dry	1	L209064	09/10/2012	09/11/2012	8270C
Surrogate: 2-Fluorophenol	*65 %*		*25-121*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: Phenol-d5	*71 %*		*24-113*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: Nitrobenzene-d5	*68 %*		*23-120*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

J1R0V4

1209022-02 (Soil)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Semivolatile Organic Compounds by SW846 8270C								
Surrogate: 2-Fluorobiphenyl	*69 %*	*30-115*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: 2,4,6-Tribromophenol	*59 %*	*19-122*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*
Surrogate: p-Terphenyl-d14	*89 %*	*18-137*			*L209064*	*09/10/2012*	*09/11/2012*	*8270C*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C										
Blank (L209064-BLK1)				Prepared: 09/10/2012 Analyzed: 09/11/2012						
1,2,4-Trichlorobenzene	330	U	330	ug/kg wet						
1,2-Dichlorobenzene	330	U	330	ug/kg wet						
1,3-Dichlorobenzene	330	U	330	ug/kg wet						
1,4-Dichlorobenzene	330	U	330	ug/kg wet						
2,4,5-Trichlorophenol	330	U	330	ug/kg wet						
2,4,6-Trichlorophenol	330	U	330	ug/kg wet						
2,4-Dichlorophenol	330	U	330	ug/kg wet						
2,4-Dimethylphenol	330	U	330	ug/kg wet						
2,4-Dinitrophenol	1650	U	1650	ug/kg wet						
2,4-Dinitrotoluene	330	U	330	ug/kg wet						
2,6-Dinitrotoluene	330	U	330	ug/kg wet						
2-Chloronaphthalene	330	U	330	ug/kg wet						
2-Chlorophenol	330	U	330	ug/kg wet						
2-Methylnaphthalene	330	U	330	ug/kg wet						
2-Methylphenol	330	U	330	ug/kg wet						
2-Nitroaniline	1650	U	1650	ug/kg wet						
2-Nitrophenol	330	U	330	ug/kg wet						
3,3'-Dichlorobenzidine	660	U	660	ug/kg wet						
3-Nitroaniline	1650	U	1650	ug/kg wet						
4,6-Dinitro-2-methylphenol	330	U	330	ug/kg wet						
4-Bromophenyl Phenyl Ether	330	U	330	ug/kg wet						
4-Chloro-3-methylphenol	330	U	330	ug/kg wet						
4-Chloroaniline	330	U	330	ug/kg wet						
4-Chlorophenyl Phenyl Ether	330	U	330	ug/kg wet						
3- and/or 4-Methylphenol	330	U	330	ug/kg wet						
4-Nitroaniline	1650	U	1650	ug/kg wet						
4-Nitrophenol	1650	U	1650	ug/kg wet						
Acenaphthene	330	U	330	ug/kg wet						
Acenaphthylene	330	U	330	ug/kg wet						
Anthracene	330	U	330	ug/kg wet						
Benz[a]anthracene	330	U	330	ug/kg wet						
Benzo[a] pyrene	330	U	330	ug/kg wet						
Benzo[b] fluoranthene	330	U	330	ug/kg wet						
Benzo[g,h,i] perylene	330	U	330	ug/kg wet						
Benzo[k] fluoranthene	330	U	330	ug/kg wet						
Bis(2-chloroethoxy) methane	330	U	330	ug/kg wet						

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C										
Blank (L209064-BLK1)				Prepared: 09/10/2012 Analyzed: 09/11/2012						
Bis(2-chloroethyl) ether	330	U	330	ug/kg wet						
Bis(2-chloroisopropyl) ether	330	U	330	ug/kg wet						
Bis(2-ethylhexyl) phthalate	330	U	330	ug/kg wet						
Butyl Benzyl Phthalate	330	U	330	ug/kg wet						
Carbazole	330	U	330	ug/kg wet						
Chrysene	330	U	330	ug/kg wet						
Dibenz[a,h]anthracene	330	U	330	ug/kg wet						
Dibenzofuran	330	U	330	ug/kg wet						
Diethyl Phthalate	330	U	330	ug/kg wet						
Dimethyl Phthalate	330	U	330	ug/kg wet						
Di-n-butyl Phthalate	330	U	330	ug/kg wet						
Di-n-octyl Phthalate	330	U	330	ug/kg wet						
Fluoranthene	330	U	330	ug/kg wet						
Fluorene	330	U	330	ug/kg wet						
Hexachlorobenzene	330	U	330	ug/kg wet						
Hexachlorobutadiene	330	U	330	ug/kg wet						
Hexachlorocyclopentadiene	330	U	330	ug/kg wet						
Hexachloroethane	330	U	330	ug/kg wet						
Indeno[1,2,3-cd]pyrene	330	U	330	ug/kg wet						
Isophorone	330	U	330	ug/kg wet						
Naphthalene	330	U	330	ug/kg wet						
Nitrobenzene	330	U	330	ug/kg wet						
N-Nitrosodi-n-propylamine	330	U	330	ug/kg wet						
N-Nitrosodiphenylamine	330	U	330	ug/kg wet						
Pentachlorophenol	1650	U	1650	ug/kg wet						
Phenanthrene	330	U	330	ug/kg wet						
Phenol	330	U	330	ug/kg wet						
Pyrene	330	U	330	ug/kg wet						
Unknown 1 TICS	244	J		ug/kg wet						
Trichloro-1-propene	218	J		ug/kg wet						
Aldol Condensate 2	25400	A, J		ug/kg wet						
Aldol Condensate 3 RLG 9/17/12	199	A, J		ug/kg wet						
Aldol Condensate 1	720	A, J		ug/kg wet						
Surrogate: 2-Fluorophenol	*1590*			*ug/kg wet*	*2500.0*		*63*	*25-121*		
Surrogate: Phenol-d5	*1790*			*ug/kg wet*	*2500.0*		*71*	*24-113*		
Surrogate: Nitrobenzene-d5	*1180*			*ug/kg wet*	*1666.7*		*71*	*23-120*		

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C									
Blank (L209064-BLK1)			Prepared: 09/10/2012 Analyzed: 09/11/2012						
Surrogate: 2-Fluorobiphenyl	*1290*		*ug/kg wet*	*1666.7*		*77*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1070*		*ug/kg wet*	*2500.0*		*43*	*19-122*		
Surrogate: p-Terphenyl-d14	*1590*		*ug/kg wet*	*1666.7*		*95*	*18-137*		
LCS (L209064-BS1)			Prepared: 09/10/2012 Analyzed: 09/11/2012						
1,2,4-Trichlorobenzene	1460		ug/kg wet	2000.0		73	45-110		
1,2-Dichlorobenzene	1640		ug/kg wet	2000.0		82	45-105		
1,3-Dichlorobenzene	1600		ug/kg wet	2000.0		80	40-100		
1,4-Dichlorobenzene	1610		ug/kg wet	2000.0		81	35-105		
2,4,5-Trichlorophenol	1520		ug/kg wet	2000.0		76	30-140		
2,4,6-Trichlorophenol	880		ug/kg wet	2000.0		44	20-110		
2,4-Dichlorophenol	1570		ug/kg wet	2000.0		78	40-110		
2,4-Dimethylphenol	1450		ug/kg wet	2000.0		72	30-105		
2,4-Dinitrophenol	446		ug/kg wet	2000.0		22*	25-130		
2,4-Dinitrotoluene	2010		ug/kg wet	2000.0		101	50-115		
2,6-Dinitrotoluene	1910		ug/kg wet	2000.0		96	40-120		
2-Chloronaphthalene	1690		ug/kg wet	2000.0		85	45-115		
2-Chlorophenol	1460		ug/kg wet	2000.0		73	45-105		
2-Methylnaphthalene	1520		ug/kg wet	2000.0		76	45-110		
2-Methylphenol	1800		ug/kg wet	2000.0		90	40-120		
2-Nitroaniline	1920		ug/kg wet	2000.0		96	45-120		
2-Nitrophenol	1450		ug/kg wet	2000.0		73	40-110		
3,3'-Dichlorobenzidine	1810		ug/kg wet	2000.0		90	15-130		
3-Nitroaniline	1880		ug/kg wet	2000.0		94	40-130		
4,6-Dinitro-2-methylphenol	642		ug/kg wet	2000.0		32	20-140		
4-Bromophenyl Phenyl Ether	1930		ug/kg wet	2000.0		96	45-115		
4-Chloro-3-methylphenol	1710		ug/kg wet	2000.0		86	35-115		
4-Chloroaniline	1400		ug/kg wet	2000.0		70	10-100		
4-Chlorophenyl Phenyl Ether	1750		ug/kg wet	2000.0		87	45-110		
3- and/or 4-Methylphenol	1750		ug/kg wet	2000.0		88	40-120		
4-Nitroaniline	2040		ug/kg wet	2000.0		102	40-130		
4-Nitrophenol	1750		ug/kg wet	2000.0		88	15-140		
Acenaphthene	1770		ug/kg wet	2000.0		88	45-110		
Acenaphthylene	1790		ug/kg wet	2000.0		90	45-115		
Anthracene	1700		ug/kg wet	2000.0		85	45-130		
Benz[a]anthracene	1910		ug/kg wet	2000.0		96	45-130		
Benzo[a] pyrene	1910		ug/kg wet	2000.0		95	45-130		

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C									
LCS (L209064-BS1)			Prepared: 09/10/2012 Analyzed: 09/11/2012						
Benzo[b] fluoranthene	2090		ug/kg wet	2000.0		104	40-130		
Benzo[g,h,i] perylene	1810		ug/kg wet	2000.0		91	45-125		
Benzo[k] fluoranthene	1920		ug/kg wet	2000.0		96	45-125		
Bis(2-chloroethoxy) methane	1540		ug/kg wet	2000.0		77	45-110		
Bis(2-chloroethyl) ether	1660		ug/kg wet	2000.0		83	40-110		
Bis(2-chloroisopropyl) ether	1650		ug/kg wet	2000.0		82	30-115		
Bis(2-ethylhexyl) phthalate	2110		ug/kg wet	2000.0		106	40-145		
Butyl Benzyl Phthalate	1990		ug/kg wet	2000.0		100	50-125		
Carbazole	1750		ug/kg wet	2000.0		88	40-140		
Chrysene	1920		ug/kg wet	2000.0		96	45-130		
Dibenz[a,h]anthracene	1890		ug/kg wet	2000.0		94	45-125		
Dibenzofuran	1810		ug/kg wet	2000.0		91	45-120		
Diethyl Phthalate	2000		ug/kg wet	2000.0		100	50-125		
Dimethyl Phthalate	1850		ug/kg wet	2000.0		92	45-130		
Di-n-butyl Phthalate	1800		ug/kg wet	2000.0		90	50-130		
Di-n-octyl Phthalate	2400		ug/kg wet	2000.0		120	40-150		
Fluoranthene	1780		ug/kg wet	2000.0		89	45-130		
Fluorene	1760		ug/kg wet	2000.0		88	45-120		
Hexachlorobenzene	2080		ug/kg wet	2000.0		104	45-130		
Hexachlorobutadiene	1680		ug/kg wet	2000.0		84	45-105		
Hexachlorocyclopentadiene	1290		ug/kg wet	2000.0		65	10-100		
Hexachloroethane	1670		ug/kg wet	2000.0		84	35-110		
Indeno[1,2,3-cd]pyrene	1890		ug/kg wet	2000.0		95	45-130		
Isophorone	1510		ug/kg wet	2000.0		76	40-110		
Naphthalene	1530		ug/kg wet	2000.0		77	40-110		
Nitrobenzene	1420		ug/kg wet	2000.0		71	40-105		
N-Nitrosodi-n-propylamine	2080		ug/kg wet	2000.0		104	30-130		
N-Nitrosodiphenylamine	1910		ug/kg wet	2000.0		95	50-120		
Pentachlorophenol	1150		ug/kg wet	2000.0		58	25-120		
Phenanthrene	1820		ug/kg wet	2000.0		91	50-120		
Phenol	1670		ug/kg wet	2000.0		83	40-115		
Pyrene	1840		ug/kg wet	2000.0		92	45-125		
Surrogate: 2-Fluorophenol	*2090*		*ug/kg wet*	*2500.0*		*84*	*25-121*		
Surrogate: Phenol-d5	*2200*		*ug/kg wet*	*2500.0*		*88*	*24-113*		
Surrogate: Nitrobenzene-d5	*1330*		*ug/kg wet*	*1666.7*		*80*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1550*		*ug/kg wet*	*1666.7*		*93*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1080*		*ug/kg wet*	*2500.0*		*43*	*19-122*		

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C									
LCS (L209064-BS1)			Prepared: 09/10/2012 Analyzed: 09/11/2012						
Surrogate: p-Terphenyl-d14	*1630*		*ug/kg wet*	*1666.7*		*98*	*18-137*		
Matrix Spike (L209064-MS1)		**Source: 1209022-01**	Prepared: 09/10/2012 Analyzed: 09/11/2012						
1,2,4-Trichlorobenzene	1150		ug/kg dry	1977.9	324 U	58	45-110		
1,2-Dichlorobenzene	1260		ug/kg dry	1977.9	324 U	64	45-105		
1,3-Dichlorobenzene	1200		ug/kg dry	1977.9	324 U	61	40-100		
1,4-Dichlorobenzene	1240		ug/kg dry	1977.9	324 U	63	35-105		
2,4,5-Trichlorophenol	1610		ug/kg dry	1977.9	324 U	81	30-140		
2,4,6-Trichlorophenol	1280		ug/kg dry	1977.9	324 U	65	20-110		
2,4-Dichlorophenol	1300		ug/kg dry	1977.9	324 U	66	40-110		
2,4-Dimethylphenol	1280		ug/kg dry	1977.9	324 U	65	30-105		
2,4-Dinitrophenol	534		ug/kg dry	1977.9	1620 U	27	25-130		
2,4-Dinitrotoluene	1690		ug/kg dry	1977.9	324 U	86	50-115		
2,6-Dinitrotoluene	1560		ug/kg dry	1977.9	324 U	79	40-120		
2-Chloronaphthalene	1350		ug/kg dry	1977.9	324 U	68	45-115		
2-Chlorophenol	1170		ug/kg dry	1977.9	324 U	59	45-105		
2-Methylnaphthalene	1250		ug/kg dry	1977.9	324 U	63	45-110		
2-Methylphenol	1550		ug/kg dry	1977.9	324 U	79	40-120		
2-Nitroaniline	1580		ug/kg dry	1977.9	1620 U	80	45-120		
2-Nitrophenol	1150		ug/kg dry	1977.9	324 U	58	40-110		
3,3'-Dichlorobenzidine	1310		ug/kg dry	1977.9	648 U	66	15-130		
3-Nitroaniline	1370		ug/kg dry	1977.9	1620 U	69	40-130		
4,6-Dinitro-2-methylphenol	891		ug/kg dry	1977.9	324 U	45	20-140		
4-Bromophenyl Phenyl Ether	1600		ug/kg dry	1977.9	324 U	81	45-115		
4-Chloro-3-methylphenol	1450		ug/kg dry	1977.9	324 U	73	35-115		
4-Chloroaniline	980		ug/kg dry	1977.9	324 U	50	10-100		
4-Chlorophenyl Phenyl Ether	1450		ug/kg dry	1977.9	324 U	73	45-110		
3- and/or 4-Methylphenol	1390		ug/kg dry	1977.9	324 U	70	40-120		
4-Nitroaniline	1600		ug/kg dry	1977.9	1620 U	81	40-130		
4-Nitrophenol	1720		ug/kg dry	1977.9	1620 U	87	15-140		
Acenaphthene	1410		ug/kg dry	1977.9	324 U	71	45-110		
Acenaphthylene	1460		ug/kg dry	1977.9	324 U	74	45-115		
Anthracene	1480		ug/kg dry	1977.9	324 U	75	45-130		
Benz[a]anthracene	1570		ug/kg dry	1977.9	324 U	79	45-130		
Benzo[a] pyrene	1590		ug/kg dry	1977.9	324 U	81	45-130		
Benzo[b] fluoranthene	1630		ug/kg dry	1977.9	324 U	83	40-130		
Benzo[g,h,i] perylene	1430		ug/kg dry	1977.9	324 U	73	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 L209064 - SW 3540C									
Matrix Spike (L209064-MS1)		**Source: 1209022-01**	Prepared: 09/10/2012 Analyzed: 09/11/2012						
Benzo[k] fluoranthene	1700		ug/kg dry	1977.9	324 U	86	45-125		
Bis(2-chloroethoxy) methane	1240		ug/kg dry	1977.9	324 U	63	45-110		
Bis(2-chloroethyl) ether	1290		ug/kg dry	1977.9	324 U	65	40-110		
Bis(2-chloroisopropyl) ether	1310		ug/kg dry	1977.9	324 U	66	30-115		
Bis(2-ethylhexyl) phthalate	1760		ug/kg dry	1977.9	324 U	89	40-145		
Butyl Benzyl Phthalate	1630		ug/kg dry	1977.9	324 U	82	50-125		
Carbazole	1490		ug/kg dry	1977.9	324 U	75	40-140		
Chrysene	1550		ug/kg dry	1977.9	324 U	78	45-130		
Dibenz[a,h]anthracene	1530		ug/kg dry	1977.9	324 U	77	45-125		
Dibenzofuran	1450		ug/kg dry	1977.9	324 U	73	45-120		
Diethyl Phthalate	1660		ug/kg dry	1977.9	324 U	84	50-125		
Dimethyl Phthalate	1520		ug/kg dry	1977.9	324 U	77	45-130		
Di-n-butyl Phthalate	1510		ug/kg dry	1977.9	324 U	76	50-130		
Di-n-octyl Phthalate	1980		ug/kg dry	1977.9	324 U	100	40-150		
Fluoranthene	1490		ug/kg dry	1977.9	324 U	75	45-130		
Fluorene	1430		ug/kg dry	1977.9	324 U	72	45-120		
Hexachlorobenzene	1690		ug/kg dry	1977.9	324 U	85	45-130		
Hexachlorobutadiene	1300		ug/kg dry	1977.9	324 U	66	45-105		
Hexachlorocyclopentadiene	1060		ug/kg dry	1977.9	324 U	54	10-100		
Hexachloroethane	1270		ug/kg dry	1977.9	324 U	64	35-110		
Indeno[1,2,3-cd]pyrene	1520		ug/kg dry	1977.9	324 U	77	45-130		
Isophorone	1200		ug/kg dry	1977.9	324 U	61	40-110		
Naphthalene	1210		ug/kg dry	1977.9	324 U	61	40-110		
Nitrobenzene	1140		ug/kg dry	1977.9	324 U	58	40-105		
N-Nitrosodi-n-propylamine	1660		ug/kg dry	1977.9	324 U	84	30-130		
N-Nitrosodiphenylamine	1580		ug/kg dry	1977.9	324 U	80	50-120		
Pentachlorophenol	1290		ug/kg dry	1977.9	1620 U	65	25-120		
Phenanthrene	1510		ug/kg dry	1977.9	324 U	76	50-120		
Phenol	1330		ug/kg dry	1977.9	324 U	67	40-115		
Pyrene	1500		ug/kg dry	1977.9	324 U	76	45-125		
Surrogate: 2-Fluorophenol	*1630*		*ug/kg dry*	*2472.3*		*66*	*25-121*		
Surrogate: Phenol-d5	*1800*		*ug/kg dry*	*2472.3*		*73*	*24-113*		
Surrogate: Nitrobenzene-d5	*1060*		*ug/kg dry*	*1648.2*		*65*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1250*		*ug/kg dry*	*1648.2*		*76*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1970*		*ug/kg dry*	*2472.3*		*80*	*19-122*		
Surrogate: p-Terphenyl-d14	*1370*		*ug/kg dry*	*1648.2*		*83*	*18-137*		

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2620 Fermi Avenue	Project Number: K3983	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 08:03

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 L209064 - SW 3540C									
Matrix Spike Dup (L209064-MSD1)	**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/11/2012						
1,2,4-Trichlorobenzene	1180		ug/kg dry	1984.4	324 U	60	45-110	3	40
1,2-Dichlorobenzene	1260		ug/kg dry	1984.4	324 U	64	45-105	0.1	40
1,3-Dichlorobenzene	1210		ug/kg dry	1984.4	324 U	61	40-100	0.5	40
1,4-Dichlorobenzene	1230		ug/kg dry	1984.4	324 U	62	35-105	0.9	40
2,4,5-Trichlorophenol	1420		ug/kg dry	1984.4	324 U	72	30-140	13	40
2,4,6-Trichlorophenol	820		ug/kg dry	1984.4	324 U	41	20-110	44*	40
2,4-Dichlorophenol	1270		ug/kg dry	1984.4	324 U	64	40-110	3	40
2,4-Dimethylphenol	1290		ug/kg dry	1984.4	324 U	65	30-105	0.09	40
2,4-Dinitrophenol	323		ug/kg dry	1984.4	1620 U	16*	25-130	49*	40
2,4-Dinitrotoluene	1610		ug/kg dry	1984.4	324 U	81	50-115	6	40
2,6-Dinitrotoluene	1530		ug/kg dry	1984.4	324 U	77	40-120	2	40
2-Chloronaphthalene	1360		ug/kg dry	1984.4	324 U	69	45-115	0.3	40
2-Chlorophenol	1190		ug/kg dry	1984.4	324 U	60	45-105	1	40
2-Methylnaphthalene	1240		ug/kg dry	1984.4	324 U	63	45-110	0.5	40
2-Methylphenol	1520		ug/kg dry	1984.4	324 U	77	40-120	2	40
2-Nitroaniline	1510		ug/kg dry	1984.4	1620 U	76	45-120	4	40
2-Nitrophenol	1210		ug/kg dry	1984.4	324 U	61	40-110	4	40
3,3'-Dichlorobenzidine	1350		ug/kg dry	1984.4	648 U	68	15-130	3	40
3-Nitroaniline	1370		ug/kg dry	1984.4	1620 U	69	40-130	0.09	40
4,6-Dinitro-2-methylphenol	656		ug/kg dry	1984.4	324 U	33	20-140	31	40
4-Bromophenyl Phenyl Ether	1560		ug/kg dry	1984.4	324 U	79	45-115	3	40
4-Chloro-3-methylphenol	1360		ug/kg dry	1984.4	324 U	69	35-115	6	40
4-Chloroaniline	1060		ug/kg dry	1984.4	324 U	53	10-100	8	40
4-Chlorophenyl Phenyl Ether	1430		ug/kg dry	1984.4	324 U	72	45-110	2	40
3- and/or 4-Methylphenol	1390		ug/kg dry	1984.4	324 U	70	40-120	0.2	40
4-Nitroaniline	1520		ug/kg dry	1984.4	1620 U	77	40-130	5	40
4-Nitrophenol	1270		ug/kg dry	1984.4	1620 U	64	15-140	31	40
Acenaphthene	1430		ug/kg dry	1984.4	324 U	72	45-110	0.6	40
Acenaphthylene	1460		ug/kg dry	1984.4	324 U	74	45-115	0.09	40
Anthracene	1450		ug/kg dry	1984.4	324 U	73	45-130	2	40
Benz[a]anthracene	1550		ug/kg dry	1984.4	324 U	78	45-130	1	40
Benzo[a] pyrene	1580		ug/kg dry	1984.4	324 U	80	45-130	1	40
Benzo[b] fluoranthene	1750		ug/kg dry	1984.4	324 U	88	40-130	7	40
Benzo[g,h,i] perylene	1390		ug/kg dry	1984.4	324 U	70	45-125	4	40
Benzo[k] fluoranthene	1600		ug/kg dry	1984.4	324 U	81	45-125	6	40
Bis(2-chloroethoxy) methane	1240		ug/kg dry	1984.4	324 U	63	45-110	0.5	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 L209064 - SW 3540C									
Matrix Spike Dup (L209064-MSD1)	**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/11/2012						
Bis(2-chloroethyl) ether	1310		ug/kg dry	1984.4	324 U	66	40-110	0.6	40
Bis(2-chloroisopropyl) ether	1290		ug/kg dry	1984.4	324 U	65	30-115	2	40
Bis(2-ethylhexyl) phthalate	1780		ug/kg dry	1984.4	324 U	90	40-145	1	40
Butyl Benzyl Phthalate	1630		ug/kg dry	1984.4	324 U	82	50-125	0.4	40
Carbazole	1450		ug/kg dry	1984.4	324 U	73	40-140	3	40
Chrysene	1560		ug/kg dry	1984.4	324 U	79	45-130	0.4	40
Dibenz[a,h]anthracene	1470		ug/kg dry	1984.4	324 U	74	45-125	4	40
Dibenzofuran	1470		ug/kg dry	1984.4	324 U	74	45-120	0.6	40
Diethyl Phthalate	1620		ug/kg dry	1984.4	324 U	82	50-125	3	40
Dimethyl Phthalate	1490		ug/kg dry	1984.4	324 U	75	45-130	2	40
Di-n-butyl Phthalate	1510		ug/kg dry	1984.4	324 U	76	50-130	0.3	40
Di-n-octyl Phthalate	2100		ug/kg dry	1984.4	324 U	106	40-150	5	40
Fluoranthene	1470		ug/kg dry	1984.4	324 U	74	45-130	2	40
Fluorene	1420		ug/kg dry	1984.4	324 U	71	45-120	1	40
Hexachlorobenzene	1700		ug/kg dry	1984.4	324 U	86	45-130	0.2	40
Hexachlorobutadiene	1370		ug/kg dry	1984.4	324 U	69	45-105	5	40
Hexachlorocyclopentadiene	990		ug/kg dry	1984.4	324 U	50	10-100	7	40
Hexachloroethane	1260		ug/kg dry	1984.4	324 U	64	35-110	1	40
Indeno[1,2,3-cd]pyrene	1470		ug/kg dry	1984.4	324 U	74	45-130	4	40
Isophorone	1220		ug/kg dry	1984.4	324 U	61	40-110	0.9	40
Naphthalene	1230		ug/kg dry	1984.4	324 U	62	40-110	1	40
Nitrobenzene	1170		ug/kg dry	1984.4	324 U	59	40-105	2	40
N-Nitrosodi-n-propylamine	1650		ug/kg dry	1984.4	324 U	83	30-130	1	40
N-Nitrosodiphenylamine	1560		ug/kg dry	1984.4	324 U	79	50-120	2	40
Pentachlorophenol	832		ug/kg dry	1984.4	1620 U	42	25-120	43*	40
Phenanthrene	1510		ug/kg dry	1984.4	324 U	76	50-120	0.2	40
Phenol	1320		ug/kg dry	1984.4	324 U	67	40-115	0.8	40
Pyrene	1510		ug/kg dry	1984.4	324 U	76	45-125	0.6	40
Surrogate: 2-Fluorophenol	*1600*		*ug/kg dry*	*2480.4*		*64*	*25-121*		
Surrogate: Phenol-d5	*1660*		*ug/kg dry*	*2480.4*		*67*	*24-113*		
Surrogate: Nitrobenzene-d5	*1040*		*ug/kg dry*	*1653.6*		*63*	*23-120*		
Surrogate: 2-Fluorobiphenyl	*1180*		*ug/kg dry*	*1653.6*		*71*	*30-115*		
Surrogate: 2,4,6-Tribromophenol	*1040*		*ug/kg dry*	*2480.4*		*42*	*19-122*		
Surrogate: p-Terphenyl-d14	*1270*		*ug/kg dry*	*1653.6*		*77*	*18-137*		

PREPARATION BENCH SHEET

L209064

Lionville Laboratory

Printed: 9/11/2012 1:18:44PM

000000032

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

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1209022-01	8270C TCL SVOC	09/10/2012 17:18	30.79	1				500	WC-Hanford, Inc.	
1209022-02	8270C TCL SVOC	09/10/2012 17:18	30.37	1				500	WC-Hanford, Inc.	
L209064-BLK1	QC	09/10/2012 17:18	30	1				500		
L209064-BS1	QC	09/10/2012 17:18	30	1	1200843		600	500		
L209064-MS1	QC	09/10/2012 17:18	30.57	1	1200843	1209022-01	600	500		
L209064-MSD1	QC	09/10/2012 17:18	30.47	1	1200843	1209022-01	600	500		

9/11/12 1315

Extracts Relinquished By Date

9/11/12 1315

Extracts Received By Date

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264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/23/2012 09:09

Analytical Report for Organochlorine Pesticides by SW846 8081A

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R1P5	1209022-01	Soil	09/04/2012 11:50	09/07/2012 15:25
J1R0V4	1209022-02	Soil	09/05/2012 12:55	09/07/2012 15:25

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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

Client: WC-HANFORD RC-075 K3983
LVL #: 1209022

W.O. #: 60049-001-001-0001-00
Date Received: 09-07-2012

CHLORINATED PESTICIDES

Two (2) soil samples were collected on 09-04,05-2012.

The samples and associated QC samples were extracted 09-10-2012 and analyzed 09-13-2012 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 8081A for client specified target compounds. All samples received Copper-Sulfur cleanup based on SW846 method 3660A.

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 samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.

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

3. The samples required a 4-fold instrument dilution due to the nature of the matrix. Reporting limits have been adjusted to reflect the necessary dilutions.

4. All obtainable surrogate recoveries were within acceptance criteria.

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

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. The samples are reported on a dry weight basis.

9. 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.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria. Per SW846 Method 8000B, the attached table lists compounds where the %difference or drift was greater than 15%, and the mean across all compounds was used for evaluation of the continuing calibration. Results associated with these compounds are considered to have greater uncertainty. The data reflected an increase in instrument response, so the ability to identify targets was not impaired.

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

Iain Daniels
LvL Laboratory Manager

9/21/12
Date

8081A/B Pesticides
Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 9.13.12 8:23:58 AM		CCV2 9.13.12 1:57:44 PM		CCV3 9.13.12 7:38:48 PM		CCV4		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)						16.3										
alpha-BHC	16.6			15.2		16.2										
gamma-BHC																
beta-BHC																
delta-BHC						15.3										
Heptachlor																
Aldrin																
Heptachlor epoxide																
gamma chlordane																
alpha chlordane																
Endosulfan I																
4,4'-DDE																
Dieldrin																
Endrin																
4,4'-DDD																
Endosulfan II																
4,4'-DDT																
Endrin aldehyde																
Endosulfan sulfate																
Methoxychlor																
Endrin ketone																
Toxaphene																
Mean %D or %Drift	6.5	1.3	6.0	8.3	3.9	10.0										

Sample results reported from affected CCV:

CCV1: 1208090-01, L209063-BLK1, BS1; 1209045-BS1, MSD1

CCV2: L209063-BSD1, 1208090-01, 1209022-01,02, L209063-MS1, MSD1

CCV3: _____

CCV4: _____

CCV5: _____

CCV6: _____

CCV7: _____

CCV8: _____

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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2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/23/2012 09:09

J1R1P5
1209022-01 (Soil)

Lionville Laboratory

Organochlorine Pesticides by SW846 8081A

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
alpha-BHC	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
gamma-BHC	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
beta-BHC	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
delta-BHC	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Heptachlor	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Aldrin	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Heptachlor epoxide	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
gamma-Chlordane	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
alpha-Chlordane	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan I	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDE	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Dieldrin	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDD	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan II	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDT	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin aldehyde	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan sulfate	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Methoxychlor	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin ketone	1.32	U	1.32	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Toxaphene	13.2	U	13.2	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*87.4 %*		*28-166*			*L209063*	*09/10/2012*	*09/13/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*90.6 %*		*37-153*			*L209063*	*09/10/2012*	*09/13/2012*	*8081A*

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J1R0V4

1209022-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Organochlorine Pesticides by SW846 8081A									
alpha-BHC	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
gamma-BHC	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
beta-BHC	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
delta-BHC	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Heptachlor	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Aldrin	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Heptachlor epoxide	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
gamma-Chlordane	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
alpha-Chlordane	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan I	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDE	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Dieldrin	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDD	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan II	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
4,4'-DDT	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin aldehyde	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endosulfan sulfate	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Methoxychlor	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Endrin ketone	1.36	U	1.36	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Toxaphene	13.6	U	13.6	ug/kg dry	4	L209063	09/10/2012	09/13/2012	8081A
Surrogate: Tetrachloro-meta-xylene	*82.6 %*		*28-166*			*L209063*	*09/10/2012*	*09/13/2012*	*8081A*
Surrogate: Decachlorobiphenyl	*87.0 %*		*37-153*			*L209063*	*09/10/2012*	*09/13/2012*	*8081A*

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Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209063 - SW 3540C										
Blank (L209063-BLK1)				Prepared: 09/10/2012 Analyzed: 09/13/2012						
alpha-BHC	0.330	U	0.330	ug/kg wet						
gamma-BHC	0.330	U	0.330	ug/kg wet						
beta-BHC	0.330	U	0.330	ug/kg wet						
delta-BHC	0.330	U	0.330	ug/kg wet						
Heptachlor	0.330	U	0.330	ug/kg wet						
Aldrin	0.330	U	0.330	ug/kg wet						
Heptachlor epoxide	0.330	U	0.330	ug/kg wet						
gamma-Chlordane	0.330	U	0.330	ug/kg wet						
alpha-Chlordane	0.330	U	0.330	ug/kg wet						
Endosulfan I	0.330	U	0.330	ug/kg wet						
4,4'-DDE	0.330	U	0.330	ug/kg wet						
Dieldrin	0.330	U	0.330	ug/kg wet						
Endrin	0.330	U	0.330	ug/kg wet						
4,4'-DDD	0.330	U	0.330	ug/kg wet						
Endosulfan II	0.330	U	0.330	ug/kg wet						
4,4'-DDT	0.330	U	0.330	ug/kg wet						
Endrin aldehyde	0.330	U	0.330	ug/kg wet						
Endosulfan sulfate	0.330	U	0.330	ug/kg wet						
Methoxychlor	0.330	U	0.330	ug/kg wet						
Endrin ketone	0.330	U	0.330	ug/kg wet						
Toxaphene	3.30	U	3.30	ug/kg wet						
Surrogate: Tetrachloro-meta-xylene	*28.3*			*ug/kg wet*	*33.337*		*85.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*31.1*			*ug/kg wet*	*33.333*		*93.2*	*37-153*		
LCS (L209063-BS1)				Prepared: 09/10/2012 Analyzed: 09/13/2012						
alpha-BHC	35.0		0.330	ug/kg wet	33.333		105	65-145		
gamma-BHC	34.1		0.330	ug/kg wet	33.333		102	70-143		
beta-BHC	30.8		0.330	ug/kg wet	33.333		92.5	75-143		
delta-BHC	32.4		0.330	ug/kg wet	33.333		97.3	65-143		
Heptachlor	32.3		0.330	ug/kg wet	33.333		97.0	70-139		
Aldrin	30.2		0.330	ug/kg wet	33.333		90.6	70-143		
Heptachlor epoxide	31.8		0.330	ug/kg wet	33.333		95.5	71-138		
gamma-Chlordane	31.7		0.330	ug/kg wet	33.333		95.0	71-137		
alpha-Chlordane	31.4		0.330	ug/kg wet	33.333		94.2	72-136		
Endosulfan I	31.9		0.330	ug/kg wet	33.333		95.6	72-139		
4,4'-DDE	32.9		0.330	ug/kg wet	33.333		98.8	70-154		
Dieldrin	32.2		0.330	ug/kg wet	33.333		96.7	73-143		

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Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209063 - SW 3540C									
LCS (L209063-BS1)			Prepared: 09/10/2012 Analyzed: 09/13/2012						
Endrin	32.2	0.330	ug/kg wet	33.333		96.7	74-137		
4,4'-DDD	32.0	0.330	ug/kg wet	33.333		96.1	52-153		
Endosulfan II	31.9	0.330	ug/kg wet	33.333		95.6	72-139		
4,4'-DDT	31.4	0.330	ug/kg wet	33.333		94.3	58-148		
Endrin aldehyde	21.3	0.330	ug/kg wet	33.333		64.0	49-129		
Endosulfan sulfate	30.8	0.330	ug/kg wet	33.333		92.3	66-139		
Methoxychlor	31.8	0.330	ug/kg wet	33.333		95.4	50-144		
Endrin ketone	31.4	0.330	ug/kg wet	33.333		94.3	70-139		
Surrogate: Tetrachloro-meta-xylene	*28.9*		*ug/kg wet*	*33.337*		*86.7*	*28-166*		
Surrogate: Decachlorobiphenyl	*29.4*		*ug/kg wet*	*33.333*		*88.1*	*37-153*		
LCS Dup (L209063-BSD1)			Prepared: 09/10/2012 Analyzed: 09/13/2012						
alpha-BHC	31.6	0.330	ug/kg wet	33.333		94.8	65-145	10.2	40
gamma-BHC	30.7	0.330	ug/kg wet	33.333		92.0	70-143	10.5	40
beta-BHC	27.7	0.330	ug/kg wet	33.333		83.0	75-143	10.8	40
delta-BHC	29.0	0.330	ug/kg wet	33.333		87.0	65-143	11.2	40
Heptachlor	29.4	0.330	ug/kg wet	33.333		88.2	70-139	9.50	40
Aldrin	28.0	0.330	ug/kg wet	33.333		84.0	70-143	7.56	40
Heptachlor epoxide	28.6	0.330	ug/kg wet	33.333		85.8	71-138	10.7	40
gamma-Chlordane	28.7	0.330	ug/kg wet	33.333		86.0	71-137	9.94	40
alpha-Chlordane	28.5	0.330	ug/kg wet	33.333		85.4	72-136	9.80	40
Endosulfan I	28.9	0.330	ug/kg wet	33.333		86.8	72-139	9.65	40
4,4'-DDE	29.4	0.330	ug/kg wet	33.333		88.2	70-154	11.3	40
Dieldrin	29.1	0.330	ug/kg wet	33.333		87.3	73-143	10.2	40
Endrin	29.9	0.330	ug/kg wet	33.333		89.8	74-137	7.40	40
4,4'-DDD	28.3	0.330	ug/kg wet	33.333		84.8	52-153	12.5	40
Endosulfan II	28.8	0.330	ug/kg wet	33.333		86.4	72-139	10.1	40
4,4'-DDT	28.8	0.330	ug/kg wet	33.333		86.5	58-148	8.63	40
Endrin aldehyde	18.3	0.330	ug/kg wet	33.333		55.0	49-129	15.1	40
Endosulfan sulfate	28.0	0.330	ug/kg wet	33.333		84.0	66-139	9.42	40
Methoxychlor	29.0	0.330	ug/kg wet	33.333		87.0	50-144	9.21	40
Endrin ketone	28.1	0.330	ug/kg wet	33.333		84.3	70-139	11.2	40
Surrogate: Tetrachloro-meta-xylene	*26.0*		*ug/kg wet*	*33.337*		*78.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*25.0*		*ug/kg wet*	*33.333*		*75.1*	*37-153*		

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Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209063 - SW 3540C										
Matrix Spike (L209063-MS1)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/13/2012						
alpha-BHC	30.6	D	1.32	ug/kg dry	33.412	1.32 U	91.7	65-145		
gamma-BHC	31.6	D	1.32	ug/kg dry	33.412	1.32 U	94.6	70-143		
beta-BHC	31.7	D	1.32	ug/kg dry	33.412	1.32 U	94.8	75-143		
delta-BHC	28.6	D	1.32	ug/kg dry	33.412	1.32 U	85.6	65-143		
Heptachlor	31.3	D	1.32	ug/kg dry	33.412	1.32 U	93.8	70-139		
Aldrin	26.7	D	1.32	ug/kg dry	33.412	1.32 U	80.0	70-143		
Heptachlor epoxide	31.6	D	1.32	ug/kg dry	33.412	1.32 U	94.5	71-138		
gamma-Chlordane	31.0	D	1.32	ug/kg dry	33.412	1.32 U	92.8	71-137		
alpha-Chlordane	32.0	D	1.32	ug/kg dry	33.412	1.32 U	95.7	72-136		
Endosulfan I	31.4	D	1.32	ug/kg dry	33.412	1.32 U	94.1	72-139		
4,4'-DDE	32.2	D	1.32	ug/kg dry	33.412	1.32 U	96.4	70-154		
Dieldrin	31.2	D	1.32	ug/kg dry	33.412	1.32 U	93.4	73-143		
Endrin	33.6	D	1.32	ug/kg dry	33.412	1.32 U	101	74-137		
4,4'-DDD	32.2	D	1.32	ug/kg dry	33.412	1.32 U	96.5	52-153		
Endosulfan II	32.4	D	1.32	ug/kg dry	33.412	1.32 U	97.1	72-139		
4,4'-DDT	27.7	D	1.32	ug/kg dry	33.412	1.32 U	82.9	58-148		
Endrin aldehyde	26.1	D	1.32	ug/kg dry	33.412	1.32 U	78.1	49-129		
Endosulfan sulfate	31.7	D	1.32	ug/kg dry	33.412	1.32 U	94.8	66-139		
Methoxychlor	34.6	D	1.32	ug/kg dry	33.412	1.32 U	104	50-144		
Endrin ketone	33.5	D	1.32	ug/kg dry	33.412	1.32 U	100	70-139		
Surrogate: Tetrachloro-meta-xylene	*30.4*			*ug/kg dry*	*33.416*		*91.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*31.8*			*ug/kg dry*	*33.412*		*95.2*	*37-153*		
Matrix Spike Dup (L209063-MSD1)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/13/2012						
alpha-BHC	31.4	D	1.32	ug/kg dry	33.269	1.32 U	94.4	65-145	2.90	40
gamma-BHC	32.1	D	1.32	ug/kg dry	33.269	1.32 U	96.4	70-143	1.88	40
beta-BHC	31.6	D	1.32	ug/kg dry	33.269	1.32 U	95.1	75-143	0.316	40
delta-BHC	28.7	D	1.32	ug/kg dry	33.269	1.32 U	86.4	65-143	0.930	40
Heptachlor	31.5	D	1.32	ug/kg dry	33.269	1.32 U	94.6	70-139	0.849	40
Aldrin	27.4	D	1.32	ug/kg dry	33.269	1.32 U	82.4	70-143	2.96	40
Heptachlor epoxide	31.7	D	1.32	ug/kg dry	33.269	1.32 U	95.3	71-138	0.843	40
gamma-Chlordane	31.3	D	1.32	ug/kg dry	33.269	1.32 U	94.0	71-137	1.28	40
alpha-Chlordane	32.0	D	1.32	ug/kg dry	33.269	1.32 U	96.3	72-136	0.625	40
Endosulfan I	31.4	D	1.32	ug/kg dry	33.269	1.32 U	94.4	72-139	0.318	40
4,4'-DDE	31.9	D	1.32	ug/kg dry	33.269	1.32 U	96.0	70-154	0.416	40
Dieldrin	31.2	D	1.32	ug/kg dry	33.269	1.32 U	93.7	73-143	0.321	40
Endrin	33.6	D	1.32	ug/kg dry	33.269	1.32 U	101	74-137	0.297	40

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/23/2012 09:09

Organochlorine Pesticides by SW846 8081A - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209063 - SW 3540C										
Matrix Spike Dup (L209063-MSD1)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/13/2012						
4,4'-DDD	32.4	D	1.32	ug/kg dry	33.269	1.32 U	97.5	52-153	1.03	40
Endosulfan II	32.4	D	1.32	ug/kg dry	33.269	1.32 U	97.4	72-139	0.308	40
4,4'-DDT	27.7	D	1.32	ug/kg dry	33.269	1.32 U	83.2	58-148	0.361	40
Endrin aldehyde	24.3	D	1.32	ug/kg dry	33.269	1.32 U	73.0	49-129	6.75	40
Endosulfan sulfate	31.4	D	1.32	ug/kg dry	33.269	1.32 U	94.3	66-139	0.529	40
Methoxychlor	35.0	D	1.32	ug/kg dry	33.269	1.32 U	105	50-144	1.53	40
Endrin ketone	33.5	D	1.32	ug/kg dry	33.269	1.32 U	101	70-139	0.199	40
Surrogate: Tetrachloro-meta-xylene	*31.3*			*ug/kg dry*	*33.272*		*94.0*	*28-166*		
Surrogate: Decachlorobiphenyl	*33.2*			*ug/kg dry*	*33.269*		*99.7*	*37-153*		

PREPARATION BENCH SHEET

L209063

Lionville Laboratory

Printed: 9/11/2012 1:18:03PM

000000045

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1201060**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1208090-01	MASTER PESTICIDES 8081A	09/10/2012 16:46	30	10				250	LQA	
1209022-01	8081A TCL Pesticides	09/10/2012 16:46	30.18	10				250	WC-Hanford, Inc.	
1209022-01	8082 PCBs	09/10/2012 16:46	30.18	10				250	WC-Hanford, Inc.	
~~1209022-01~~	~~MASTER PESTICIDES 8081A~~	~~09/10/2012 16:46~~	~~30.18~~	~~10~~	VOID			~~250~~	~~WC-Hanford, Inc.~~ RE SAMPLE	Added for BatchQC in: L209063
1209022-02	8081A TCL Pesticides	09/10/2012 16:46	30.53	10				250	WC-Hanford, Inc.	
1209022-02	8082 PCBs	09/10/2012 16:46	30.53	10				250	WC-Hanford, Inc.	
L209063-BLK1	QC	09/10/2012 16:46	30	10				250		pest
L209063-BLK2	QC	09/10/2012 16:46	30	10				250		pcb
L209063-BS1	QC	09/10/2012 16:46	30	10	1200903		250	250		pest
L209063-BS2	QC	09/10/2012 16:46	30	10	1200902		250	250		pcb
L209063-BSD1	QC	09/10/2012 16:46	30	10	1200903		250	250		pest
L209063-MS1	QC	09/10/2012 16:46	30.16	10	1200903	1209022-01	250	250		pest
L209063-MS2	QC	09/10/2012 16:46	30.18	10	1200902	1209022-01	250	250		pcb
L209063-MSD1	QC	09/10/2012 16:46	30.29	10	1200903	1209022-01	250	250		pest
L209063-MSD2	QC	09/10/2012 16:46	30.39	10	1200902	1209022-01	250	250		pcb

S cleaned 09.11.12 SZ
Cu lot # G16W031

9/11/12 1320 — Extracts Relinquished By — Date

09/11/12. 13:20 — Extracts Received By — Date

PCBs

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 20:02

Analytical Report for Polychlorinated Biphenyls by SW846 8082

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R1P5	1209022-01	Soil	09/04/2012 11:50	09/07/2012 15:25
J1R0V4	1209022-02	Soil	09/05/2012 12:55	09/07/2012 15:25

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

Client: WC-HANFORD RC-075 K3983
LVL #: 1209022

W.O. #: 60049-001-001-0001-00
Received: 09-07-2012

PCBs

Two (2) soil samples were collected on 09-04,05-2012.

The samples and associated QC samples were extracted 09-10-2012 and analyzed 09-12-2012 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 samples that met LvL's sample acceptance policy with exceptions noted on the Sample Receipt Checklist.
2. All required holding times for extraction and analysis have been met.
3. All obtainable surrogate recoveries were within acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. The samples are 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. Per SW846 Method 8000B, the attached table lists compounds where the %difference or drift was greater than 15%, and the mean across all compounds was used for evaluation of the continuing calibration. Results associated with these compounds are considered to have greater uncertainty.
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

9/27/12
Date

r:\group\data\2012\pcb\wc hanford\1209022oj.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.

8082/A PCBs

Analytes with %Difference or %Drift >15%, Where Mean is Used for Continuing Calibration

Analyte	CCV1 09.12.12 09:13:15 AM		CCV2 09.12.12 2:57:44 PM		CCV3		CCV4		CCV5		CCV6		CCV7		CCV8	
	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary
Tetrachloro-meta-xylene (surrogate)																
Decachlorobiphenyl (surrogate)	-17.1															
Aroclor 1016-1																
Aroclor 1016-2																
Aroclor 1016-3																
Aroclor 1016-4		15.2														
Aroclor 1016-5		15.4														
Aroclor 1260-1																
Aroclor 1260-2																
Aroclor 1260-3		15.8		17.4												
Aroclor 1260-4																
Aroclor 1260-5																
Mean %D or %Drift	-11.3	10.2	-8.8	10.8												

Sample results reported from affected CCV:

CCV1: L209063-BIK2, BS2, MS2, MSD2; 1209022-01,02

CCV2:

CCV3:

CCV4:

CCV5:

CCV6:

CCV7:

CCV8:

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-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 20:02

J1R1P5
1209022-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1221	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1232	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1242	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1248	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1254	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1260	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1262	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1268	13.3	U	13.3	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Surrogate: Decachlorobiphenyl	*87 %*		*43-144*			*L209063*	*09/10/2012*	*09/12/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*90 %*		*52-141*			*L209063*	*09/10/2012*	*09/12/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 20:02

J1R0V4

1209022-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Polychlorinated Biphenyls by SW846 8082									
Aroclor 1016	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1221	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1232	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1242	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1248	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1254	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1260	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1262	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Aroclor 1268	13.7	U	13.7	ug/kg dry	1	L209063	09/10/2012	09/12/2012	8082
Surrogate: Decachlorobiphenyl	*90 %*		*43-144*			*L209063*	*09/10/2012*	*09/12/2012*	*8082*
Surrogate: Tetrachloro-meta-xylene	*91 %*		*52-141*			*L209063*	*09/10/2012*	*09/12/2012*	*8082*

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/17/2012 20:02

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 L209063 - SW 3540C										
Blank (L209063-BLK2)				Prepared: 09/10/2012 Analyzed: 09/12/2012						
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	*32.6*			*ug/kg wet*	*33.333*		*98*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*35.7*			*ug/kg wet*	*33.337*		*107*	*52-141*		
LCS (L209063-BS2)				Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aroclor 1016	127		13.3	ug/kg wet	166.67		76	50-138		
Aroclor 1260	148		13.3	ug/kg wet	166.67		89	50-148		
Surrogate: Decachlorobiphenyl	*29.9*			*ug/kg wet*	*33.333*		*90*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.0*			*ug/kg wet*	*33.337*		*93*	*52-141*		
Matrix Spike (L209063-MS2)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aroclor 1016	130		13.3	ug/kg dry	166.95	13.3 U	78	50-138		
Aroclor 1260	150		13.3	ug/kg dry	166.95	13.3 U	90	50-148		
Surrogate: Decachlorobiphenyl	*28.8*			*ug/kg dry*	*33.390*		*86*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.0*			*ug/kg dry*	*33.394*		*93*	*52-141*		
Matrix Spike Dup (L209063-MSD2)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aroclor 1016	124		13.2	ug/kg dry	165.80	13.3 U	75	50-138	4	40
Aroclor 1260	145		13.2	ug/kg dry	165.80	13.3 U	87	50-148	2	40
Surrogate: Decachlorobiphenyl	*31.5*			*ug/kg dry*	*33.160*		*95*	*43-144*		
Surrogate: Tetrachloro-meta-xylene	*31.8*			*ug/kg dry*	*33.163*		*96*	*52-141*		

PREPARATION BENCH SHEET

L209063

Lionville Laboratory

Printed: 9/11/2012 1:18:03PM

000000054

Matrix: Solid **Prepared using: GC - SW 3540C** **Surrogate used: 1201060**

Lab Number	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1208090-01	MASTER PESTICIDES 8081A	09/10/2012 16:46	30	10				250	LQA	
1209022-01	8081A TCL Pesticides	09/10/2012 16:46	30.18	10				250	WC-Hanford, Inc.	
1209022-01	8082 PCBs	09/10/2012 16:46	30.18	10				250	WC-Hanford, Inc.	
~~1209022-01~~	~~MASTER PESTICIDES 8081A~~	~~09/10/2012 16:46~~	~~30.18~~	~~10~~	VOID			~~250~~	~~WC-Hanford, Inc.~~ NO SAMPLE	Added for BatchQC in: L209063
1209022-02	8081A TCL Pesticides	09/10/2012 16:46	30.53	10				250	WC-Hanford, Inc.	
1209022-02	8082 PCBs	09/10/2012 16:46	30.53	10				250	WC-Hanford, Inc.	
L209063-BLK1	QC	09/10/2012 16:46	30	10				250		pest
L209063-BLK2	QC	09/10/2012 16:46	30	10				250		pcb
L209063-BS1	QC	09/10/2012 16:46	30	10	1200903		250	250		pest
L209063-BS2	QC	09/10/2012 16:46	30	10	1200902		250	250		pcb
L209063-BSD1	QC	09/10/2012 16:46	30	10	1200903		250	250		pest
L209063-MS1	QC	09/10/2012 16:46	30.16	10	1200903	1209022-01	250	250		pest
L209063-MS2	QC	09/10/2012 16:46	30.18	10	1200902	1209022-01	250	250		pcb
L209063-MSD1	QC	09/10/2012 16:46	30.29	10	1200903	1209022-01	250	250		pest
L209063-MSD2	QC	09/10/2012 16:46	30.39	10	1200902	1209022-01	250	250		pcb

S cleared 09.11.12 SZ
Cu lot # G16W031

9/11/12 1320
Extracts Relinquished By Date

09/11/12. 13:20
Extracts Received By Date

METALS

264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/13/2012 13:53

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R1P5	1209022-01	Soil	09/04/2012 11:50	09/07/2012 15:25
J1R0V4	1209022-02	Soil	09/05/2012 12:55	09/07/2012 15:25

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Case Narrative

Client: WC-HANFORD RC-075
LVL#: 1209022
SDG/SAF#: K3983/RC-075

W.O.#: 60049-001-001-0001-00
Date Received: 09-07-12

METALS

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

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

1. This narrative covers the analyses of 2 soil samples.

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

   The samples were analyzed and reported with 3-fold dilutions for ICP metals due to sample matrix.

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

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

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

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

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

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

9. All Standard Reference Material (SRM) analytes were within the Prediction Interval control limits supplied by the manufacturer with the exception of Aluminum with a 214.1% recovery (range 0-200.8%). The sample results for Aluminum were reported and could be biased high.

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

10. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits.

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

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Nickel 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.

for

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/13/12
Date

alm/09-022hgotherlno%

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-075 Project Number: K3983 Project Manager: Joan Kessner	**Reported:** 09/13/2012 13:53

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-075 Project Number: K3983 Project Manager: Joan Kessner	**Reported:** 09/13/2012 13:53

J1R1P5
1209022-01 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**7330**		13.0	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Antimony	1.56	U	1.56	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Arsenic	**2.63**		2.61	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Barium	**60.9**		1.30	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Beryllium	**0.289**	B	0.521	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Boron	**1.52**	B	5.21	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Cadmium	0.521	U	0.521	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Calcium	**7510**		261	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Chromium	**9.13**		0.521	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Cobalt	**8.57**		5.21	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Copper	**15.1**		2.61	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Iron	**27100**		52.1	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Lead	**3.44**		1.30	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Magnesium	**5200**		195	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Manganese	**384**		13.0	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Molybdenum	5.21	U	5.21	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Nickel	**11.9**		10.4	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Potassium	**1150**		1040	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Selenium	0.782	U	0.782	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Silicon	**397**		5.21	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Silver	0.521	U	0.521	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Sodium	**421**		130	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Vanadium	**73.5**		6.52	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Zinc	**47.3**		26.1	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Mercury	0.0259	U	0.0259	mg/kg dry	1	L209055	09/10/2012	09/10/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-075 Project Number: K3983 Project Manager: Joan Kessner	**Reported:** 09/13/2012 13:53

J1R0V4
1209022-02 (Soil)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory									
Metals by SW846 6000/7000 series									
Aluminum	**7890**		14.6	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Antimony	1.75	U	1.75	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Arsenic	**2.87**	B	2.91	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Barium	**99.9**		1.46	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Beryllium	**0.302**	B	0.583	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Boron	**2.25**	B	5.83	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Cadmium	0.583	U	0.583	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Calcium	**8540**		291	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Chromium	**8.54**		0.583	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Cobalt	**8.59**		5.83	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Copper	**15.8**		2.91	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Iron	**26600**		58.3	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Lead	**3.88**		1.46	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Magnesium	**4910**		219	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Manganese	**344**		14.6	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Molybdenum	5.83	U	5.83	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Nickel	**10.7**	B	11.7	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Potassium	**1230**		1170	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Selenium	0.874	U	0.874	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Silicon	**321**		5.83	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Silver	0.583	U	0.583	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Sodium	**534**		146	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Vanadium	**68.6**		7.28	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Zinc	**46.2**		29.1	mg/kg dry	3	L209066	09/10/2012	09/12/2012	6010B
Mercury	0.0255	U	0.0255	mg/kg dry	1	L209055	09/10/2012	09/10/2012	7471A

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-075 Project Number: K3983 Project Manager: Joan Kessner	**Reported:** 09/13/2012 13:53

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 L209055 - SW 7471A Prep										
Blank (L209055-BLK1)				Prepared & Analyzed: 09/10/2012						
Mercury	0.0290	U	0.0290	mg/kg wet						
Duplicate (L209055-DUP3)		**Source: 1209022-01**		Prepared & Analyzed: 09/10/2012						
Mercury	0.0252	U	0.0252	mg/kg dry		0.0259 U				20
Matrix Spike (L209055-MS3)		**Source: 1209022-01**		Prepared & Analyzed: 09/10/2012						
Mercury	0.151		0.0245	mg/kg dry	0.13618	0.0259 U	111	75-125		20
Reference (L209055-SRM1)				Prepared & Analyzed: 09/10/2012						
Mercury	1.24		0.0273	mg/kg wet	1.2900		96.4	62.6-138		
Batch L209066 - SW 3050B										
Blank (L209066-BLK1)				Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aluminum	4.42	B	4.63	mg/kg wet						
Antimony	0.556	U	0.556	mg/kg wet						
Arsenic	0.926	U	0.926	mg/kg wet						
Barium	0.463	U	0.463	mg/kg wet						
Beryllium	0.185	U	0.185	mg/kg wet						
Boron	0.490	B	1.85	mg/kg wet						
Cadmium	0.185	U	0.185	mg/kg wet						
Calcium	12.9	B	92.6	mg/kg wet						
Chromium	0.185	U	0.185	mg/kg wet						
Cobalt	1.85	U	1.85	mg/kg wet						
Copper	0.926	U	0.926	mg/kg wet						
Iron	18.5	U	18.5	mg/kg wet						
Lead	0.463	U	0.463	mg/kg wet						
Magnesium	69.4	U	69.4	mg/kg wet						
Manganese	4.63	U	4.63	mg/kg wet						
Molybdenum	1.85	U	1.85	mg/kg wet						
Nickel	3.70	U	3.70	mg/kg wet						
Potassium	370	U	370	mg/kg wet						
Selenium	0.278	U	0.278	mg/kg wet						
Silicon	1.85	U	1.85	mg/kg wet						
Silver	0.185	U	0.185	mg/kg wet						
Sodium	46.3	U	46.3	mg/kg wet						
Vanadium	2.31	U	2.31	mg/kg wet						
Zinc	9.26	U	9.26	mg/kg wet						

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/13/2012 13:53

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 L209066 - SW 3050B										
Duplicate (L209066-DUP3)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aluminum	7620		14.5	mg/kg dry		7330			3.88	20
Antimony	1.74	U	1.74	mg/kg dry		1.56 U				20
Arsenic	2.51	B	2.91	mg/kg dry		2.63			4.59	20
Barium	65.1		1.45	mg/kg dry		60.9			6.64	20
Beryllium	0.297	B	0.581	mg/kg dry		0.289			2.93	20
Boron	1.52	B	5.81	mg/kg dry		1.52			0.431	20
Cadmium	0.581	U	0.581	mg/kg dry		0.521 U				20
Calcium	9250		291	mg/kg dry		7510			20.8*	20
Chromium	7.64		0.581	mg/kg dry		9.13			17.8	20
Cobalt	8.65		5.81	mg/kg dry		8.57			0.920	20
Copper	16.3		2.91	mg/kg dry		15.1			7.70	20
Iron	28500		58.1	mg/kg dry		27100			5.10	20
Lead	3.39		1.45	mg/kg dry		3.44			1.65	20
Magnesium	5070		218	mg/kg dry		5200			2.68	20
Manganese	352		14.5	mg/kg dry		384			8.71	20
Molybdenum	5.81	U	5.81	mg/kg dry		5.21 U				20
Nickel	9.45	B	11.6	mg/kg dry		11.9			22.9*	20
Potassium	1160	B	1160	mg/kg dry		1150			0.585	20
Selenium	0.872	U	0.872	mg/kg dry		0.782 U				20
Silicon	458		5.81	mg/kg dry		397			14.2	20
Silver	0.581	U	0.581	mg/kg dry		0.521 U				20
Sodium	488		145	mg/kg dry		421			14.6	20
Vanadium	78.0		7.27	mg/kg dry		73.5			6.01	20
Zinc	49.2		29.1	mg/kg dry		47.3			3.97	20
Matrix Spike (L209066-MS3)		**Source: 1209022-01**		Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aluminum	9100		14.0	mg/kg dry	186.61	7330	951*	75-125		
Antimony	20.1		1.68	mg/kg dry	46.654	1.56 U	43.0*	75-125		
Arsenic	167		2.80	mg/kg dry	186.61	2.63	88.2	75-125		
Barium	233		1.40	mg/kg dry	186.61	60.9	92.1	75-125		
Beryllium	4.48		0.560	mg/kg dry	4.6654	0.289	89.9	75-125		
Boron	78.5		5.60	mg/kg dry	93.307	1.52	82.5	75-125		
Cadmium	4.22		0.560	mg/kg dry	4.6654	0.521 U	90.5	75-125		
Calcium	10600		280	mg/kg dry	2332.7	7510	135*	75-125		
Chromium	25.3		0.560	mg/kg dry	18.661	9.13	86.6	75-125		
Cobalt	49.7		5.60	mg/kg dry	46.654	8.57	88.2	75-125		
Copper	36.8		2.80	mg/kg dry	23.327	15.1	93.2	75-125		

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/13/2012 13:53

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 L209066 - SW 3050B									
Matrix Spike (L209066-MS3)		**Source: 1209022-01**	Prepared: 09/10/2012 Analyzed: 09/12/2012						
Iron	28200	56.0	mg/kg dry	93.307	27100	1220*	75-125		
Lead	43.6	1.40	mg/kg dry	46.654	3.44	86.2	75-125		
Magnesium	7220	210	mg/kg dry	2332.7	5200	86.2	75-125		
Manganese	412	14.0	mg/kg dry	46.654	384	58.6*	75-125		
Molybdenum	83.3	5.60	mg/kg dry	93.307	5.21 U	89.3	75-125		
Nickel	51.0	11.2	mg/kg dry	46.654	11.9	83.8	75-125		
Potassium	3320	1120	mg/kg dry	2332.7	1150	93.2	75-125		
Selenium	158	0.840	mg/kg dry	186.61	0.782 U	84.7	75-125		
Silicon	517	5.60	mg/kg dry	93.307	397	128*	75-125		
Silver	4.14	0.560	mg/kg dry	4.6654	0.521 U	88.7	75-125		
Sodium	2740	140	mg/kg dry	2332.7	421	99.5	75-125		
Vanadium	125	7.00	mg/kg dry	46.654	73.5	110	75-125		
Zinc	90.7	28.0	mg/kg dry	46.654	47.3	93.0	75-125		
Post Spike (L209066-PS3)		**Source: 1209022-01**	Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aluminum	145000		ug/L	66000	84300	92.0	75-125		
Antimony	276		ug/L	300.00	1.42	91.4	75-125		
Calcium	142000		ug/L	62400	86400	89.3	75-125		
Iron	423000		ug/L	126000	311000	88.6	75-125		
Manganese	7160		ug/L	3000.0	4420	91.1	75-125		
Silicon	10800		ug/L	6300.0	4570	99.2	75-125		
Reference (L209066-SRM1)			Prepared: 09/10/2012 Analyzed: 09/12/2012						
Aluminum	14300	14.7	mg/kg wet	6670.0		214*	0-200.89		
Antimony	52.6	1.76	mg/kg wet	53.000		99.3	0-235.8		
Arsenic	111	2.94	mg/kg wet	114.00		97.8	82.8-117.54		
Barium	285	1.47	mg/kg wet	307.00		92.7	79.8-120.2		
Beryllium	103	0.588	mg/kg wet	108.00		95.8	82.8-117.6		
Boron	80.6	5.88	mg/kg wet	85.100		94.7	67.5-132.8		
Cadmium	217	0.588	mg/kg wet	225.00		96.6	83.6-116.4		
Calcium	3220	294	mg/kg wet	3360.0		95.9	83.3-116.9		
Chromium	85.8	0.588	mg/kg wet	77.200		111	73.3-126.4		
Cobalt	158	5.88	mg/kg wet	166.00		95.3	80.7-118.7		
Copper	261	2.94	mg/kg wet	271.00		96.4	80.8-119.2		
Iron	8480	58.8	mg/kg wet	8420.0		101	78.6-121.1		
Lead	178	1.47	mg/kg wet	190.00		93.6	81.6-118.4		
Magnesium	8110	221	mg/kg wet	8570.0		94.7	83.2-116.7		
Manganese	799	14.7	mg/kg wet	965.00		82.7	69.3-130.5		

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/13/2012 13:53

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 L209066 - SW 3050B									
Reference (L209066-SRM1)			Prepared: 09/10/2012 Analyzed: 09/12/2012						
Molybdenum	232	5.88	mg/kg wet	235.00		98.7	76.2-123.8		
Nickel	212	11.8	mg/kg wet	221.00		96.1	79.6-120.8		
Potassium	14100	1180	mg/kg wet	14400		98.2	81.9-118.1		
Selenium	186	0.882	mg/kg wet	187.00		99.3	75.9-124.6		
Silicon	476	5.88	mg/kg wet	807.00		58.9	0-219.3		
Silver	78.9	0.588	mg/kg wet	83.500		94.5	82.7-117.1		
Sodium	9110	147	mg/kg wet	9730.0		93.6	82.5-117.2		
Vanadium	108	7.35	mg/kg wet	98.700		109	75.9-123.6		
Zinc	194	29.4	mg/kg wet	199.00		97.3	78.4-121.6		

Lionville Laboratory

Logbook #: 1154

SAMPLE DIGESTION RECORD

Digestion Batch #: L209066
Date/Time Initiated: 9/10/12 1955
Date/Time Completed: 9/11/12 1850
Analyst: UB
Matrix (circle): Soil Water Other OIL
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.

Digested / Undigested (circle one)
Balance #: B14
Balance Cal Verification: Y NA
Temp: 97°
BLOCK 1 2 (circle one)
3

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
1208090-01		0.57	50		TOT	fine	Light Brown Soil	NA	NA
L209066-DUP1		0.54	50			fine	Light Brown Soil		
MS1	0.5	0.55	50			fine	Light Brown Soil		
1209014-01		0.50	50			OIL	BLACK OIL		
L209066-DUP2		0.52	50			OIL	BLACK OIL		
MS2	0.5	0.51	50			OIL	BLACK OIL		
1209022-01		0.58	50			fine	Brown Dirt		
L209066-DUP3		0.52	50			fine	Brown Dirt		
MS3	0.5	0.54	50			fine	Brown Dirt		
BLK		0.54	50			COARSE	Boiling Chip		
SRM		0.51	50			fine	Pink LOAMY		
1209022-02		0.54	50			fine	Brown Soil		

Spiking IDs / Expiration Date:
MS#: 1200457

LCS#: 1201014

Reagent IDs:
HNO_3 L08023
HCl L13029
H_2O_2 K09A03
1:1 HNO_3 637-046-02
1:1 HCl

File ID#:

Data Review By/Date: 9/12/12

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

Page #:

000000066

Lionville Laboratory

MERCURY PREPARATION

Logbook # 1153

Analyst: [illegible] / [illegible]
Date 9/10/12
Start Time/Temp: 1505 | 94°
End Time/Temp: 1535 | 95°

Instrument ID: HG3.1
Balance # B14 /NA
Pipette Calibration (Daily) Y

Prep Batch: L209055
Worksheet: HG091001
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	
IEV		0.125	2.5	10ml	50	
CCV		0.250	5.0	10ml	50	
ICB/CCB				10ml	50	
L209055-BLK1				0.31	50	
SRM1				0.33	50	
1208090-01				0.35	50	
L209055-DUP1				0.34	50	
MS1		0.500	1.0	0.33	50	
1209004-07				0.34	50	
L209055-DUP2				0.34	50	
TC 9/10/12 022 MS2		0.500	1.0	0.36	50	
1209024-01				0.35	50	
L209055-DUP3				0.36	50	
TC 9/10/12 022 MS3		0.5	1.0	0.37	50	
1209024-02				0.37	50	

MW 9/10/12

Standard:	ID	Prep Date/Time
ICAL/MS	W.E. MW 9/10/12 RI (1200538)	9/10/12 1320
ICV/CCV/LCS	(I.V. 1200532)	N/A

Reviewed By/Date: [illegible] 9/11/12

Use book # 1153 for std traceability information

Soil LCS True Value = 1.79 mg/Kg
Standard # 12010014

W.E. MW 9/10/12

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

A

ME-HgCVAA-Prep0910

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WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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Phone: 610-280-3000
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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/21/2012 17:11

Analytical Report for Wet Chemistry

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1R1P5	1209022-01	Soil	09/04/2012 11:50	09/07/2012 15:25
J1R0V4	1209022-02	Soil	09/05/2012 12:55	09/07/2012 15:25

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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Case Narrative

Client: WC-HANFORD RC-075 K3983
LVL#: 1209022 **Date Received:** 09-07-12

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

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

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

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

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 with the exception of Sulfate at 22.9% for which the replicate results were below than the limit of quantitation.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/27/12
Date

njp\i09-022

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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2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/21/2012 17:11

Notes and Definitions

U	Analyte included in the analysis, but not detected
D	Results reported from a dilution; related reporting limits are elevated due to the presence of an interference or a high target value.
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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2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/21/2012 17:11

Wet Chemistry
Lionville Laboratory

Analyte	Result and Qualifier		LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
J1R1P5 (1209022-01) Soil										
%Solids	**99.2**			0.1	% by Weight	1	L209057	09/10/2012 12:23	09/10/2012 12:23	SM2540G
Bromide	1.0	U	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Chloride	1.0	U	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrate	**4.1**	B	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Orthophosphate	2.0	U	2.0	10.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Sulfate	**3.2**	B	1.0	5.0	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrate/Nitrite as N	**0.96**		0.10	0.50	mg/kg dry	1	L209150	09/17/2012 05:00	09/18/2012 15:41	EPA 353.2
Hexavalent Chromium	0.20	U	0.20	0.50	mg/kg dry	1	L209054	09/10/2012 10:42	09/10/2012 13:50	SW846 7196A
pH	**8.49**		0.10	0.10	pH Units	1	L209074	09/12/2012 13:55	09/12/2012 13:55	SW846 9045D
J1R0V4 (1209022-02) Soil										
%Solids	**95.3**			0.1	% by Weight	1	L209057	09/10/2012 12:23	09/10/2012 12:23	SM2540G
Bromide	1.0	U	1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Chloride	1.0	U	1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Fluoride	1.0	U	1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrate	**31.3**		1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrite	1.0	U	1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Orthophosphate	**2.1**	B	2.0	10.2	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Sulfate	**9.5**		1.0	5.1	mg/kg dry	1	L209130	09/17/2012 05:00	09/17/2012 10:29	EPA 300.0 (1993)
Nitrate/Nitrite as N	**7.46**		0.10	0.51	mg/kg dry	1	L209150	09/17/2012 05:00	09/18/2012 15:45	EPA 353.2
Hexavalent Chromium	0.21	U	0.21	0.52	mg/kg dry	1	L209054	09/10/2012 10:42	09/10/2012 13:50	SW846 7196A
pH	**8.76**		0.10	0.10	pH Units	1	L209074	09/12/2012 13:55	09/12/2012 13:55	SW846 9045D

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WC-Hanford, Inc.	Project: RC-075	
2620 Fermi Avenue	Project Number: K3983	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	09/21/2012 17:11

Wet Chemistry - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L209054 - Default Prep GenChem											
Blank (L209054-BLK1)					Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	0.20	U	0.20	0.50	mg/kg wet						
LCS (L209054-BS1)					Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	3.89		0.20	0.50	mg/kg wet	4.0000		97	80-120		
LCS (L209054-BS2)					Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	1030	D	20.0	50.0	mg/kg wet	1120.6		92	80-120		
Duplicate (L209054-DUP2)		**Source: 1209022-01**			Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	0.20	U	0.20	0.50	mg/kg dry		0.20 U				20
Matrix Spike (L209054-MS3)		**Source: 1209022-01**			Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	3.80		0.20	0.50	mg/kg dry	4.0309	0.20 U	94	75-125		
Matrix Spike (L209054-MS4)		**Source: 1209022-01**			Prepared: 09/10/2012 10:42 Analyzed: 09/10/2012 13:50						
Hexavalent Chromium	903	D	20.2	50.4	mg/kg dry	1044.8	0.20 U	86	75-125		
Batch L209057 - % Solids											
Duplicate (L209057-DUP1)		**Source: 1209022-01**			Prepared: 09/10/2012 12:23 Analyzed: 09/10/2012 12:23						
%Solids	99.3			0.1	% by Weight		99.2			0.06	20
Batch L209074 - Default Prep GenChem											
Duplicate (L209074-DUP1)		**Source: 1209022-01**			Prepared: 09/12/2012 13:55 Analyzed: 09/12/2012 13:55						
pH	8.62		0.10	0.10	pH Units		8.49			1.52	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 L209074 - Default Prep GenChem										
Reference (L209074-SRM1)				Prepared: 09/12/2012 13:55 Analyzed: 09/12/2012 13:55						
pH	10.0	0.10	0.10	pH Units	10.000		100	99-101		
Batch L209130 - Default Prep GenChem										
Blank (L209130-BLK1)				Prepared: 09/17/2012 05:00 Analyzed: 09/17/2012 10:29						
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 (L209130-BS1)				Prepared: 09/17/2012 05:00 Analyzed: 09/17/2012 10:29						
Fluoride	48.9	1.0	5.0	mg/kg wet	50.000		97.8	80-120		
Chloride	46.5	1.0	5.0	mg/kg wet	50.000		93.0	80-120		
Bromide	48.0	1.0	5.0	mg/kg wet	50.000		96.0	80-120		
Orthophosphate	48.7	2.0	10.0	mg/kg wet	50.000		97.4	80-120		
Sulfate	48.1	1.0	5.0	mg/kg wet	50.000		96.2	80-120		
Nitrate	47.7	1.0	5.0	mg/kg wet	50.000		95.4	80-120		
Nitrite	48.0	1.0	5.0	mg/kg wet	50.000		96.0	80-120		
Duplicate (L209130-DUP1)		**Source: 1209022-01**		Prepared: 09/17/2012 05:00 Analyzed: 09/17/2012 10:29						
Fluoride	1.0 U	1.0	4.9	mg/kg dry		1.0 U				20
Chloride	1.0 U	1.0	4.9	mg/kg dry		1.0 U				20
Bromide	1.0 U	1.0	4.9	mg/kg dry		1.0 U				20
Orthophosphate	2.0 U	2.0	9.8	mg/kg dry		2.0 U				20
Sulfate	2.5 B	1.0	4.9	mg/kg dry		3.2			22.9*	20
Nitrate	3.7 B	1.0	4.9	mg/kg dry		4.1			9.88	20
Nitrite	1.0 U	1.0	4.9	mg/kg dry		1.0 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 L209130 - Default Prep GenChem										
Matrix Spike (L209130-MS1)	**Source: 1209022-01**			Prepared: 09/17/2012 05:00 Analyzed: 09/17/2012 10:29						
Fluoride	46.6	1.0	5.0	mg/kg dry	49.707	1.0 U	93.8	75-125		
Chloride	44.6	1.0	5.0	mg/kg dry	49.707	1.0 U	89.8	75-125		
Bromide	46.0	1.0	5.0	mg/kg dry	49.707	1.0 U	92.6	75-125		
Orthophosphate	46.8	2.0	9.9	mg/kg dry	49.707	2.0 U	94.2	75-125		
Sulfate	50.3	1.0	5.0	mg/kg dry	49.707	3.2	94.8	75-125		
Nitrate	50.1	1.0	5.0	mg/kg dry	49.707	4.1	92.6	75-125		
Nitrite	45.5	1.0	5.0	mg/kg dry	49.707	1.0 U	91.6	75-125		
Batch L209150 - Default Prep GenChem										
Blank (L209150-BLK1)				Prepared: 09/17/2012 05:00 Analyzed: 09/18/2012 15:40						
Nitrate/Nitrite as N	0.10 U	0.10	0.50	mg/kg wet						
LCS (L209150-BS1)				Prepared: 09/17/2012 05:00 Analyzed: 09/18/2012 15:39						
Nitrate/Nitrite as N	5.42	0.10	0.50	mg/kg wet	5.0000		108	90-110		
Duplicate (L209150-DUP1)	**Source: 1209022-01**			Prepared: 09/17/2012 05:00 Analyzed: 09/18/2012 15:43						
Nitrate/Nitrite as N	0.86	0.10	0.49	mg/kg dry		0.96			11.3	20
Matrix Spike (L209150-MS1)	**Source: 1209022-01**			Prepared: 09/17/2012 05:00 Analyzed: 09/18/2012 15:44						
Nitrate/Nitrite as N	5.93	0.10	0.50	mg/kg dry	4.9707	0.96	99.9	75-125		