

0078875

**SAF-RC-030**  
**Remaining Sites Confirmation Sampling -**  
**Other Solid**  
**FINAL DATA PACKAGE**

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21

KW 9/25/08  
INITIAL/DATE

**RECEIVED**  
OCT 08 2008  
**EDMC**

COMMENTS:

**SDG K1320**

**SAF-RC-030**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 100-H-28:6**



# EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION  
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September 17, 2008

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



Reference: **P.O. #S00W235A00**  
**Eberline Services R8-09-048-7882, SDG K1320**

Dear Ms. Kessner:

Enclosed is the data report for two solid (other solid) samples designated under SAF No. RC-030 received at Eberline Services on September 5, 2008. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/njv

Enclosure: Data Package

**1.0 GENERAL**

Washington Closure Hanford (WCH) Sample Delivery Group K1320 was composed of two solid (other solid) samples designated under SAF No. RC-030 with a Project Designation of: Remaining Site Confirmation Sampling-Other Solid.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 17, 2008.

**2.0 ANALYSIS NOTES**

**2.1 Gross Alpha and Gross Beta Analysis**

No problems were encountered during the course of the analyses.

**2.2 Gamma Spectroscopy**

No problems were encountered during the course of the analyses.

**3.0 Case Narrative Certification Statement**

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

  
\_\_\_\_\_  
Melissa C. Mannion  
Senior Program Manager

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP K1320

SDG 7882  
Contact Melissa C. Mannion

Client Hanford  
Contract No. S00W235A00  
Case no SDG\_K1320

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

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Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 09/17/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1320

SDG 7882  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. S00W235A00  
Case no SDG K1320

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/17/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1320

SDG 7882  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. S00W235A00  
Case no SDG K1320

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1320

SDG 7882

Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford

Contract No. S00W235A00

Case no SDG K1320

LAB						CHAIN OF	
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED
R809048-01	J17H00	100-H-28:6	SOLID		RC-030	RC-030-100	09/03/08 09:00
R809048-02	J17H01	100-H-28:6	SOLID		RC-030	RC-030-100	09/03/08 09:15
R809048-03	Lab Control Sample		SOLID		RC-030		
R809048-04	Method Blank		SOLID		RC-030		
R809048-05	Duplicate (R809048-01)	100-H-28:6	SOLID		RC-030		09/03/08 09:00

LAB SUMMARY

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SUMMARY DATA SECTION

Page 3

Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-LS

Version 3.06

Report date 09/17/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

SDG 7882  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1320

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7882	RC-030-100	J17H00	SOLID	100.0	520 g		09/05/08	2	R809048-01	7882-001
		J17H01	SOLID	100.0	587 g		09/05/08	2	R809048-02	7882-002
		Method Blank	SOLID						R809048-04	7882-004
		Lab Control Sample	SOLID						R809048-03	7882-003
		Duplicate (R809048-01)	SOLID	100.0	520 g		09/05/08	2	R809048-05	7882-005

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 09/17/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

SDG 7882  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1320

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
<b>Gas Proportional Counting</b>										
93A	SOLID	Gross Alpha in Solids	6160-122	20.6	2		1	1	1/1	
93B	SOLID	Gross Beta in Solids	6160-122	11.0	2		1	1	1/1	
<b>Gamma Spectroscopy</b>										
GAM	SOLID	Gamma Scan	6160-122	7.0	2		1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.  
 Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE  
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

SDG 7882  
Contact Melissa C. Mannion

**LAB WORK SUMMARY**

Client Hanford  
Contract No. S00W235A00  
Case no SDG K1320

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
R809048-01	J17H00		7882-001	93A/93		09/12/08	09/15/08	BW	Gross Alpha in Solids	
09/03/08	100-H-28:6	SOLID	7882-001	93B/93		09/12/08	09/15/08	BW	Gross Beta in Solids	
09/05/08	RC-030-100	RC-030	7882-001	GAM		09/09/08	09/11/08	CSS	Gamma Scan	
R809048-02	J17H01		7882-002	93A/93		09/12/08	09/15/08	BW	Gross Alpha in Solids	
09/03/08	100-H-28:6	SOLID	7882-002	93B/93		09/12/08	09/15/08	BW	Gross Beta in Solids	
09/05/08	RC-030-100	RC-030	7882-002	GAM		09/09/08	09/11/08	CSS	Gamma Scan	
R809048-03	Lab Control Sample		7882-003	93A/93		09/13/08	09/15/08	BW	Gross Alpha in Solids	
		SOLID	7882-003	93B/93		09/13/08	09/15/08	BW	Gross Beta in Solids	
		RC-030	7882-003	GAM		09/09/08	09/11/08	CSS	Gamma Scan	
R809048-04	Method Blank		7882-004	93A/93		09/13/08	09/15/08	BW	Gross Alpha in Solids	
		SOLID	7882-004	93B/93		09/13/08	09/15/08	BW	Gross Beta in Solids	
		RC-030	7882-004	GAM		09/09/08	09/11/08	CSS	Gamma Scan	
R809048-05	Duplicate (R809048-01)		7882-005	93A/93		09/13/08	09/15/08	BW	Gross Alpha in Solids	
09/03/08	100-H-28:6	SOLID	7882-005	93B/93		09/13/08	09/15/08	BW	Gross Beta in Solids	
09/05/08		RC-030	7882-005	GAM		09/09/08	09/11/08	CSS	Gamma Scan	

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	RC-030	Gross Alpha in Solids	900.0_ALPHABETA_GPC		2		1	1	1		5
93B/93	RC-030	Gross Beta in Solids	900.0_ALPHABETA_GPC		2		1	1	1		5
GAM	RC-030	Gamma Scan	GAMMA_GS		2		1	1	1		5
<b>TOTALS</b>					<b>6</b>		<b>3</b>	<b>3</b>	<b>3</b>		<b>15</b>

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-LWS  
Version 3.06  
Report date 09/17/08

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K1320**

7882-004

Method Blank

**METHOD BLANK**

SDG <u>7882</u>	Client/Case no <u>Hanford</u>	SDG <u>K1320</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>R809048-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7882-004</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>RC-030</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.272	3.1	6.85	10.0	U	93A
Gross Beta	12587-47-2	0.783	4.9	8.63	15.0	U	93B
Potassium 40	13966-00-2	U		0.736		U	GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	U		0.025	0.100	U	GAM
Radium 226	13982-63-3	U		0.059	0.100	U	GAM
Radium 228	15262-20-1	U		0.122	0.200	U	GAM
Europium 152	14683-23-9	U		0.069	0.100	U	GAM
Europium 154	15585-10-1	U		0.081	0.100	U	GAM
Europium 155	14391-16-3	U		0.067	0.100	U	GAM
Thorium 228	14274-82-9	U		0.040		U	GAM
Thorium 232	TH-232	U		0.122		U	GAM
Uranium 235	15117-96-1	U		0.115		U	GAM
Uranium 238	U-238	U		2.86		U	GAM
Americium 241	14596-10-2	U		0.086		U	GAM

RemainSitesConfirmSampling-OtherSol

QC-BLANK #67191

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/17/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1320

7882-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7882</u>	Client/Case no <u>Hanford</u>	<u>SDG K1320</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>R809048-03</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7882-003</u>	Material/Matrix	<u>SOLID</u>
	SAF No <u>RC-030</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	142	19	7.01	10.0		93A	112	4.5	127	53-147	70-130
Gross Beta	113	8.8	8.85	15.0		93B	111	4.4	102	79-121	80-120
Cobalt 60	0.560	0.037	0.014	0.050		GAM	0.565	0.023	99	84-116	80-120
Cesium 137	0.690	0.036	0.022	0.100		GAM	0.649	0.026	106	85-115	80-120

RemainSitesConfirmSampling-OtherSol

QC-LCS #67190
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LAB CONTROL SAMPLES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>09/17/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

7882-005

J17H00

**DUPLICATE**

SDG <u>7882</u> Contact <u>Melissa C. Mannion</u> Duplicates Lab sample id <u>R809048-05</u> Dept sample id <u>7882-005</u> % solids <u>100.0</u>	ORIGINAL Lab sample id <u>R809048-01</u> Dept sample id <u>7882-001</u> Received <u>09/05/08</u> % solids <u>100.0</u>	Client/Case no <u>Hanford</u> SDG <u>K1320</u> Contract <u>No. S00W235A00</u> Client sample id <u>J17H00</u> Location/Matrix <u>100-H-28:6</u> <u>SOLID</u> Collected/Weight <u>09/03/08 09:00</u> <u>520 g</u> Custody/SAF No <u>RC-030-100</u> <u>RC-030</u>
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ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	TEST	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	σ
Gross Alpha	4.70	4.4	6.00	10.0	U	93A	4.70	4.8	6.84	U	-	0	
Gross Beta	14.9	4.1	5.66	15.0		93B	17.2	5.6	8.62		14	69	0.6
Potassium 40	10.4	0.64	0.338			GAM	9.81	0.79	0.451		6	21	0.8
Cobalt 60	U		<u>0.060</u>	0.050	U	GAM	U		0.038	U	-		0.6
Cesium 137	0.381	0.042	0.037	0.100		GAM	0.344	0.045	0.041		10	30	1.0
Radium 226	0.495	0.063	0.057	0.100		GAM	0.480	0.079	0.072		3	34	0.3
Radium 228	0.570	0.15	0.144	0.200		GAM	0.597	0.14	0.133		5	55	0.3
Europium 152	U		<u>0.186</u>	0.100	U	GAM	U		<u>0.210</u>	U	-		0.2
Europium 154	U		<u>0.107</u>	0.100	U	GAM	U		<u>0.104</u>	U	-		0
Europium 155	U		0.065	0.100	U	GAM	U		0.073	U	-		0.2
Thorium 228	0.636	0.042	0.037			GAM	0.601	0.047	0.043		6	21	0.8
Thorium 232	0.570	0.15	0.144			GAM	0.597	0.14	0.133		5	55	0.3
Uranium 235	U		0.103		U	GAM	U		0.118	U	-		0.2
Uranium 238	U		3.66		U	GAM	U		4.37	U	-		0.2
Americium 241	U		0.043		U	GAM	U		0.049	U	-		0.2

RemainSitesConfirmSampling-OtherSol

QC-DUP#1 67192

DUPLICATES

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Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>09/17/08</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K1320**

7882-001

J17H00

**DATA SHEET**

SDG <u>7882</u>	Client/Case no <u>Hanford</u>	SDG <u>K1320</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>R809048-01</u>	Client sample id <u>J17H00</u>	
Dept sample id <u>7882-001</u>	Location/Matrix <u>100-H-28:6</u>	<u>SOLID</u>
Received <u>09/05/08</u>	Collected/Weight <u>09/03/08 09:00</u>	<u>520 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-030-100</u>	<u>RC-030</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	4.70	4.8	6.84	10.0	U	93A
Gross Beta	12587-47-2	17.2	5.6	8.62	15.0		93B
Potassium 40	13966-00-2	9.81	0.79	0.451			GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	0.344	0.045	0.041	0.100		GAM
Radium 226	13982-63-3	0.480	0.079	0.072	0.100		GAM
Radium 228	15262-20-1	0.597	0.14	0.133	0.200		GAM
Europium 152	14683-23-9	U		0.210	0.100	U	GAM
Europium 154	15585-10-1	U		0.104	0.100	U	GAM
Europium 155	14391-16-3	U		0.073	0.100	U	GAM
Thorium 228	14274-82-9	0.601	0.047	0.043			GAM
Thorium 232	TH-232	0.597	0.14	0.133			GAM
Uranium 235	15117-96-1	U		0.118		U	GAM
Uranium 238	U-238	U		4.37		U	GAM
Americium 241	14596-10-2	U		0.049		U	GAM

RemainSitesConfirmSampling-OtherSol

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/17/08</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K1320**

7882-002

J17H01

**DATA SHEET**

SDG <u>7882</u>	Client/Case no <u>Hanford</u>	SDG <u>K1320</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>R809048-02</u>	Client sample id <u>J17H01</u>	
Dept sample id <u>7882-002</u>	Location/Matrix <u>100-H-28:6</u>	<u>SOLID</u>
Received <u>09/05/08</u>	Collected/Weight <u>09/03/08 09:15</u>	<u>587 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-030-100</u>	<u>RC-030</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	12.0	7.0	7.54	10.0		93A
Gross Beta	12587-47-2	15.1	4.3	5.87	15.0		93B
Potassium 40	13966-00-2	11.0	1.1	0.326			GAM
Cobalt 60	10198-40-0	U		0.045	0.050	U	GAM
Cesium 137	10045-97-3	0.292	0.044	0.043	0.100		GAM
Radium 226	13982-63-3	0.505	0.089	0.079	0.100		GAM
Radium 228	15262-20-1	0.684	0.16	0.158	0.200		GAM
Europium 152	14683-23-9	U		<u>0.148</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.142</u>	0.100	U	GAM
Europium 155	14391-16-3	U		0.100	0.100	U	GAM
Thorium 228	14274-82-9	0.791	0.060	0.060			GAM
Thorium 232	TH-232	0.684	0.16	0.158			GAM
Uranium 235	15117-96-1	U		0.188		U	GAM
Uranium 238	U-238	U		5.01		U	GAM
Americium 241	14596-10-2	U		0.059		U	GAM

RemainSitesConfirmSampling-OtherSol

Lab id <u>EBRLNE</u>
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Report date <u>09/17/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

Test 93A Matrix SOLID  
 SDG 7882  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

GROSS ALPHA IN SOLIDS  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1320

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Alpha
Preparation batch 6160-122					
R809048-01	93	7882-001	J17H00		U
R809048-02	93	7882-002	J17H01		12.0
R809048-03	93	7882-003	Lab Control Sample		ok
R809048-04	93	7882-004	Method Blank		U
R809048-05	93	7882-005	Duplicate (R809048-01)		- U

Nominal values and limits from method RDLs (pCi/g) 10.0  
 RemainSitesConfirmSampling-OtherSol

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6160-122 2σ prep error 20.6 % Reference Lab Notebook #6160, pg. 122															
R809048-01	93	J17H00	6.84	0.100			62		100			9	09/11/08	09/12	GRB-214
R809048-02	93	J17H01	7.54	0.100			110		100			9	09/11/08	09/12	GRB-216
R809048-03	93	Lab Control Sample	7.01	0.100			61		100				09/11/08	09/13	GRB-213
R809048-04	93	Method Blank	6.85	0.100			63		100				09/11/08	09/13	GRB-214
R809048-05	93	Duplicate (R809048-01)	6.00	0.100			61		100			10	09/11/08	09/13	GRB-216

Nominal values and limits from method 10.0 0.100 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 7  
 SPP-125 Gross Alpha and Gross Beta in Dissolved Solids, rev 0

AVERAGES ± 2 SD MDA 6.85 ± 1.11  
 FOR 5 SAMPLES RESIDUE 71 ± 43

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 09/17/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

Test 93B Matrix SOLID  
 SDG 7882  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

GROSS BETA IN SOLIDS  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1320

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Beta
Preparation batch 6160-122					
R809048-01	93	7882-001	J17H00		17.2
R809048-02	93	7882-002	J17H01		15.1
R809048-03	93	7882-003	Lab Control Sample		ok
R809048-04	93	7882-004	Method Blank		U
R809048-05	93	7882-005	Duplicate (R809048-01)		ok

Nominal values and limits from method RDLs (pCi/g) 15.0  
 RemainSitesConfirmSampling-OtherSol

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6160-122 2σ prep error 11.0 % Reference Lab Notebook #6160, pg. 122															
R809048-01	93	J17H00	8.62	0.100			62		100			9	09/11/08	09/12	GRB-214
R809048-02	93	J17H01	5.87	0.100			110		100			9	09/11/08	09/12	GRB-216
R809048-03	93	Lab Control Sample	8.85	0.100			61		100				09/11/08	09/13	GRB-213
R809048-04	93	Method Blank	8.63	0.100			63		100				09/11/08	09/13	GRB-214
R809048-05	93	Duplicate (R809048-01)	5.66	0.100			61		100			10	09/11/08	09/13	GRB-216

Nominal values and limits from method 15.0 0.100 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 7  
 SPP-125 Gross Alpha and Gross Beta in Dissolved Solids, rev 0

AVERAGES ± 2 SD MDA 7.53 ± 3.22  
 FOR 5 SAMPLES RESIDUE 71 ± 43

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 09/17/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1320

Test GAM Matrix SOLID  
 SDG 7882  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1320

**LAB METHOD SUMMARY**

GAMMA SCAN  
 GAMMA SPECTROSCOPY

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 6160-122					
R809048-01		7882-001	J17H00	U	0.344
R809048-02		7882-002	J17H01	U	0.292
R809048-03		7882-003	Lab Control Sample	ok	ok
R809048-04		7882-004	Method Blank	U	U
R809048-05		7882-005	Duplicate (R809048-01)	- U	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.100  
 RemainSitesConfirmSampling-OtherSol

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6160-122 2σ prep error 7.0 % Reference Lab Notebook #6160, pg. 122															
R809048-01		J17H00	<u>7.04</u>	438					122			6	09/06/08	09/09	MB,07,00
R809048-02		J17H01	<u>9.54</u>	508					122			6	09/06/08	09/09	MB,06,00
R809048-03		Lab Control Sample	0.014	430					151				09/06/08	09/09	MB,02,00
R809048-04		Method Blank	<u>5.97</u>	430					151				09/06/08	09/09	01,04,00
R809048-05		Duplicate (R809048-01)	<u>5.67</u>	438					151			6	09/06/08	09/09	MB,07,00

Nominal values and limits from method 0.050 430 100 180

PROCEDURES REFERENCE GAMMA\_GS  
 SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 7  
 SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD MDA 5.65 ± 7.00  
 FOR 5 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

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 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
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Contract No. S00W235A00  
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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.

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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.

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WORK SUMMARY

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

- \* ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
  - B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
  - H Similar to 'L' except the recovery was high.
  - P The RESULT is 'preliminary'.
  - X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
  - 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

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DATA SHEET

- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

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

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.
 

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

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DUPLICATE

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

- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

- \* The first, computed limits for the recovery reflect:

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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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.
  - \* Preparation 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.

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- \* 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

REPORT GUIDES

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SUMMARY DATA SECTION

Page 28

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 09/17/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1320

SDG 7882

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. S00W235A00

Case no SDG K1320

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.

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 29

Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 09/17/08

Collector: WELCH-KOELLING Company Contact: Matt Perrott Telephone No.: 372-9088 Project Coordinator: KESSNER, JH Price Code: 9C Data Turnaround: 15 Days

Project Designation: Remaining Sites Confirmation Sampling - Other Solid Sampling Location: K1320 (7882) 100-H-28:6 SAF No.: RC-030

Ice Chest No.: SML-544 <sup>24</sup> no date box Field Logbook No.: EL-1601-2 COA: C00H28A000 Method of Shipment: Fed Ex

Shipped To: EBERLINE SERVICES / LIONVILLE Offsite Property No.: A080 Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS	Special Handling and/or Storage	Preservation	None	None	Cool 4C
		Type of Container	G/P	G/P	
		No. of Container(s)	1	<u>None</u>	
		Volume	500mL	60mL	60mL

SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.	PCBs - 8082; Pesticides - 8081
				<u>BH 9/3/08</u>

Sample No.	Matrix *	Sample Date	Sample Time							
J17H00	OTHER SOLID	9/3/08	0900	X						
J17H01	OTHER SOLID	9/3/08	0915	X						
<del>J17H02</del>	OTHER SOLID									
<del>J17H03</del>	OTHER SOLID									
<del>J17H04</del>	OTHER SOLID									

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	(1) <u>Gamma Spectroscopy (TCL List)</u> (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); <u>Gamma Spec - Add on (Americium-241)</u> ; <u>Gross Alpha</u> ; <u>Gross Beta</u> (2) ICP Metals - 6010TR (Client 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)  Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.		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
<u>Toni Vert</u>	<u>9/3/08 1115</u>	<u>BHUDSON</u>	<u>9/3/08 1115</u>			
<u>BHUDSON</u>	<u>9/3/08 1630</u>	<u>1060 #3C</u>	<u>9/3/08 1630</u>			
<u>1060/3C</u>	<u>9/4/08 1030</u>	<u>INTL INSTANKOVICH</u>	<u>9/4/08 1030</u>			
<u>INTL INSTANKOVICH</u>	<u>9/4/08 1030</u>	<u>Fed Ex</u>				
<u>Fed Ex</u>		<u>FW</u>	<u>09/05/08 09:15</u>			

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

*W*

Shk 9/05/08

Client: W.C. HANFORD City MCHLAND State WA

Date/Time received 09/05/08 09:15 CoC No. RC-030-100

Container I.D. No. SML-524 Requested TAT (Days) 15 P.O. Received Yes [ ] No [  ]

**INSPECTION**

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

14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_

15. Inspected by [Signature] Date: 09/05/08 Time: 10:00

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide
<u>All samples</u>	<u>&lt;60</u>						

Ion Chamber Ser. No. \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. 100982

Calibration date \_\_\_\_\_  
 Calibration date \_\_\_\_\_  
 Calibration date 10 JUL 08



Joan Kessner  
WC-Hanford, Inc.  
2620 Fermi Avenue  
MSIN H9-03  
Richland, WA 99354

**Subject:** Analytical Data Package

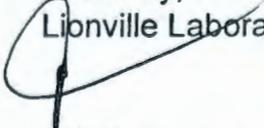
Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0809L035
SDG #	K1320
SAF #	RC-030
Date Received	9/5/08
# Samples	2
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

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

Sincerely,  
Lionville Laboratory

  
Orlette S. Johnson  
Project Manager

r:\group\pm\orlette\hanford\data\b\_ltrs.doc

Lionville Laboratory, Inc.  
 PCB ANALYTICAL DATA PACKAGE FOR  
 WC-HANFORD RC-030 K1320



DATE RECEIVED: 09/05/08

LVL LOT # :08091035

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J17H00	001	SO	08LE0423	09/03/08	09/09/08	09/15/08
J17H00	001 MS	SO	08LE0423	09/03/08	09/09/08	09/15/08
J17H00	001 MSD	SO	08LE0423	09/03/08	09/09/08	09/15/08
J17H01	002	SO	08LE0423	09/03/08	09/09/08	09/15/08

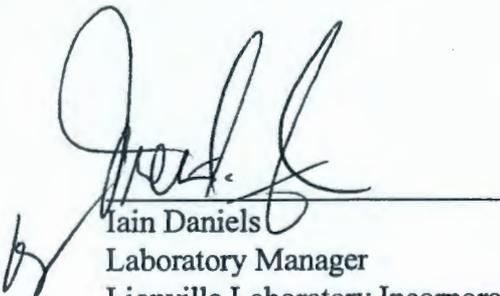
LAB QC:

PBLKUL	MB1	S	08LE0423	N/A	09/09/08	09/12/08
PBLKUL	MB1 BS	S	08LE0423	N/A	09/09/08	09/12/08





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

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

  
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 080C114

Initiator: CAC  
 Date: 9/16/08  
 Client: WC Hartford

Batch: 0809L035  
 Samples: 001ms  
 Method: SWB46/MCAWW/CLPI

Parameter: PCB  
 Matrix: SOIL  
 Prep Batch: 08LE0423

**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)**

*Recovery of Aroclor 1260 is high in ms*

*okay in MSD + BS*

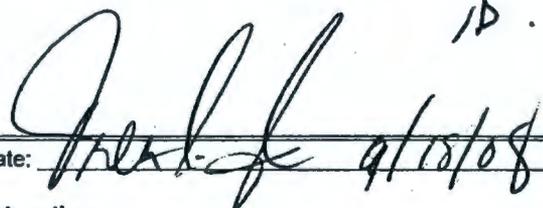
**2. Known or Probable Causes(s)**

*matrix*

**3. Discussion and Proposed Action**

Other Description:

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

*Narrate ID.*  


**4. Project Manager Instructions...signature/date:**

- 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:**

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 disposition.**

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: \_\_\_\_\_



## 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.

### 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.
- P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I 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.
- MM = No pattern match for multi-component target analytes.

RFW Batch Number: 0809L035

Client: WC-HANFORD RC-030 K1320 Work Order: 60049001001 Page: 1

0000000000

Sample Information	Cust ID:	J17H00	J17H00	J17H00	J17H01	PBLKUL	PBLKUL BS
RFW#:	001	001 MS	001 MSD	002	08LE0423-MB1	08LE0423-MB1	
Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL	
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	
Surrogate:	Tetrachloro-m-xylene	89 %	89 %	89 %	77 %	69 %	86 %
	Decachlorobiphenyl	80 %	82 %	83 %	68 %	72 %	90 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		17 U	63 %	91 %	16 U	13 U	80 %
Aroclor-1221		17 U	17 U	17 U	16 U	13 U	13 U
Aroclor-1232		17 U	17 U	17 U	16 U	13 U	13 U
Aroclor-1242		17 U	17 U	17 U	16 U	13 U	13 U
Aroclor-1248		17 U	17 U	17 U	16 U	13 U	13 U
Aroclor-1254		17 U	17 U	17 U	16 U	13 U	13 U
Aroclor-1260		17 U	152 * %	136 %	16 U	13 U	102 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.  
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. \*= Outside of EPA CLP QC

Extract. Date: 09/09/09

Extraction Batch No: 08LE0423

Analyst: MF

Method: \*\*\*\*

Test: OPCB

Cleanup Date: 09/11/08

Analyst: MF

Client: WC-HANFORD RC-029 K1316

LIMS Report Date: 09/16/08

Solvent: DCM/SCETONE,HEXANE

Adsorbent: H2SO4

00000007

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solid	Vis H2O	C/D FACTOR	Sulfur Clean?
0809L021-	WC-HANFORD RC-029 K1316												
002	J17FV6		30.0	1.0		10		1.0	N	96.97		343.7	
003	J17FV7		30.0	1.0		10		1.0	N	96.99		343.7	
003 -S	J17FV7		30.0	1.0	1.0	10		1.0	N	96.99		343.7	
003 -T	J17FV7		30.0	1.0	1.0	10		1.0	N	96.99		343.7	
004	J17FV8		30.0	1.0		10		1.0	N	92.34		361.0	
0809L035-	WC-HANFORD RC-030 K1320												
001	J17H00		30.0	1.0		10		1.0	N	78.28		425.8	
001 -S	J17H00		30.0	1.0	1.0	10		1.0	N	78.28		425.8	
001 -T	J17H00		30.0	1.0	1.0	10		1.0	N	78.28		425.8	
002	J17H01		30.0	1.0		10		1.0	N	82.56		403.7	
0809L036-	WC-HANFORD RC-029 K1319												
001	J17FY5		30.0	1.0		10		1.0	N	98.31		339.1	
002	J17FY6		30.0	1.0		10		1.0	N	97.75		341.0	
002 -S	J17FY6		30.0	1.0	1.0	10		1.0	N	97.75		341.0	
002 -T	J17FY6		30.0	1.0	1.0	10		1.0	N	97.75		341.0	
08LE0423-MB1			30.0	1.0		10		1.0	N	100.00		333.3	
08LE0423-MB1 -S			30.0	1.0	1.0	10		1.0	N	100.00		333.3	

Comments:

Surrogate: 250 UL OLM PSURR 89916407

Spike: 250 UL AR1660 89916604

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
			CAL	9/16/08	Revision

Extract. Date: 09/09/09

Extraction Batch No: 08LE0423

Analyst: MF

Method: \*\*\*\*

*SEX-3540*

Test: OPCB

Cleanup Date: 09/11/08

Analyst: MF

Client: WC-HANFORD RC-029 K1316

LIMS Report Date: 09/12/08

Solvent: DCM/SCETONE, HEXANE

Adsorbent: H2SO4

Sample No:	Client Name Client ID	pH	Initial Surr. WT/VOL	Surr. Spike Mult.	Final Spike Mult.	Final Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
0809L021-	WC-HANFORD RC-029 K1316									
002	J17FV6		30.0	1.0		10	1.0	N	96.97	343.7
003	J17FV7		30.0	1.0		10	1.0	N	96.99	343.7
003 -S	J17FV7		30.0	1.0	1.0	10	1.0	N	96.99	343.7
003 -T	J17FV7		30.0	1.0	1.0	10	1.0	N	96.99	343.7
004	J17FV8		30.0	1.0		10	1.0	N	92.34	361.0
0809L035-	WC-HANFORD RC-030 K1320									
001	J17H00		30.0	1.0		10	1.0	N	78.28	425.8
002	J17H01		30.0	1.0		10	1.0	N	82.56	403.7
002 -S	J17H01		30.0	1.0	1.0	10	1.0	N	82.56	403.7
002 -T	J17H01		30.0	1.0	1.0	10	1.0	N	82.56	403.7
0809L036-	WC-HANFORD RC-029 K1319									
001	J17FY5		30.0	1.0		10	1.0	N	98.31	339.1
002	J17FY6		30.0	1.0		10	1.0	N	97.75	341.0
002 -S	J17FY6		30.0	1.0	1.0	10	1.0	N	97.75	341.0
002 -T	J17FY6		30.0	1.0	1.0	10	1.0	N	97.75	341.0
08LE0423-MB1	PBLKUL		30.0	1.0		10	1.0	N	100.00	333.3
08LE0423-MB1 -S	PBLKUL		30.0	1.0	1.0	10	1.0	N	100.00	333.3

Comments:

Surrogate: 250 UL OLM PSURR 89916407

Spike: 250 UL AR1660 89916604

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
<i>all</i>	<i>mvj</i>	<i>9/2/08 0901</i>	<i>cz</i>	<i>9/12/08 9:10</i>	<i>GC</i>

00000000



Collector <b>WELCH-KOELLING</b>	Company Contact Matt Perott	Telephone No. 372-9088	Project Coordinator KESSNER, JH	Price Code 9C	Data Turnaround 15 Days
Project Designation Remaining Sites Confirmation Sampling - Other Solid	Sampling Location 100-H-28:6	SAF No. RC-030			
Chest No. <b>AFS-04-054</b>	Field Logbook No. EL-1601-2	COA CO0H28A000	Method of Shipment <b>Fed Ex</b>		
Shipped To <b>BERLINE SERVICES (LIONVILLE)</b>		Offsite Property No. <b>A080345</b>	Bill of Lading/Air Bill No. <b>see OSPC</b>		

Special Handling and/or Storage	Preservation	None	None	Cool 4C															
	Type of Container	G/P	G/P	aG															
	No. of Container(s)	1	1	1															
	Volume	500 mL	60 mL	60 mL															

SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	PCBs - 8082; Dioxins - 8081																
			<b>BH 9/3/08</b>																

Sample No.	Matrix *	Sample Date	Sample Time																
17H00	OTHER SOLID	9/3/08	0900		X	X													
17H01	OTHER SOLID	9/3/08	0915		X	X													
17H02	OTHER SOLID																		
17H03	OTHER SOLID																		
17H04	OTHER SOLID	9/3/08																	

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *	
Relinquished By/Removed From <b>WELCH-KOELLING</b>	Date/Time 9/3/08 1115	Received By/Stored In <b>B HUDSON</b>	Date/Time 9/3/08 1115	(1) <u>Gamma Spectroscopy (TCL List)</u> (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); <u>Gamma Spec - Add-on (Americium-241, Gross Alpha, Gross Beta)</u> (2) ICP Metals - 6010TR (Client 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)  Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.			
Relinquished By/Removed From <b>HUDSON</b>	Date/Time 9/3/08 1630	Received By/Stored In <b>1060 #3C</b>	Date/Time 9/3/08 1630				
Relinquished By/Removed From <b>OCG/SC</b>	Date/Time 9/4/08 0900	Received By/Stored In <b>WELCH</b>	Date/Time 9/4/08 0900				
Relinquished By/Removed From <b>WELCH</b>	Date/Time 9/4/08 0900	Received By/Stored In <b>Fed Ex</b>	Date/Time				
Relinquished By/Removed From <b>Fed Ex</b>	Date/Time 9.500/0950	Received By/Stored In <b>WELCH</b>	Date/Time 9.5.02/0950				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time				

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

000000010

*KW*

Lionville Laboratory Incorporated  
 SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC. Hanford  
 Project/SAF/SOW/Release #: RC-030

Date: 9-5-08

LvLI Batch #: 0809L035

Sample Custodian: D. Ames

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |  |  |
|---|--|--|
| 1. Samples Hand Delivered or <u>Shipped?</u>  | Carrier <u>Ex</u>  | Airbill # <u>7980 0576 1115</u>                          |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> No Seals                        |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | Comments:  |
| 4. All expected paperwork received (coc & other client specific information) sealed in plastic bag and easily accessible?                   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 5. Samples received <u>cooled</u> or ambient?   | Temp <u>2.2</u> °C   | Cooler # <u>AFS-04-054</u>                               |
| How was the temperature taken?  | <input checked="" type="checkbox"/> IR <input type="checkbox"/> Temp. Blank  | <input type="checkbox"/> Other (Specify):                |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> No Seals                        |
| 7. COC (Client & LvLI) signed & dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 9. All samples on COC received?<br>All samples received on COC?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |  |
| 10. All sample label information matches COC?   | <del><input checked="" type="checkbox"/> Yes</del> <input checked="" type="checkbox"/> No  | <u>001A + 002A</u><br><u>Label indicates PCBs + Pes.</u> |
| 11. Samples properly preserved? (If #5 is no, then this is no.)   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 12. Samples received within hold times?<br>Short holds taken to wet lab?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A                  |
| 13. VOA, TOC, TOX free of headspace?  | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A                  |
| 14. QC stickers placed on bottles designated by client?   | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A                  |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |  |
| 16. Project Manager contacted concerning any discrepancies?<br>Person Contacted _____   | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A<br>Date _____    |



Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 WC-HANFORD RC-030 K1320



DATE RECEIVED: 09/05/08

LVL LOT # :0809L035

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J17H00						
SILVER, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
SILVER, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
SILVER, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
ALUMINUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
ALUMINUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
ALUMINUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
ARSENIC, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
ARSENIC, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
ARSENIC, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
BORON, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
BORON, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
BORON, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
BARIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
BARIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
BARIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
BERYLLIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
BERYLLIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
BERYLLIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
CALCIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
CALCIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
CALCIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
CADMIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
CADMIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
CADMIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
COBALT, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
COBALT, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
COBALT, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
CHROMIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
CHROMIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
CHROMIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
COPPER, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
COPPER, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
COPPER, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
IRON, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
IRON, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 WC-HANFORD RC-030 K1320

DATE RECEIVED: 09/05/08

LVL LOT # :0809L035

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
MERCURY, TOTAL	001	SO	08C0157	09/03/08	09/10/08	09/10/08
MERCURY, TOTAL	001 REP	SO	08C0157	09/03/08	09/10/08	09/10/08
MERCURY, TOTAL	001 MS	SO	08C0157	09/03/08	09/10/08	09/10/08
POTASSIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
POTASSIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
POTASSIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
MAGNESIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
MAGNESIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
MAGNESIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
MANGANESE, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
MANGANESE, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
MANGANESE, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
MOLYBDENUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
MOLYBDENUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
MOLYBDENUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
SODIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
SODIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
SODIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
NICKEL, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
NICKEL, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
NICKEL, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
LEAD, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
LEAD, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
LEAD, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
ANTIMONY, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
ANTIMONY, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
ANTIMONY, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
SELENIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
SELENIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
SELENIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
SILICON, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
SILICON, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
SILICON, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
VANADIUM, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08
VANADIUM, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
VANADIUM, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
ZINC, TOTAL	001	SO	08L0338	09/03/08	09/17/08	09/18/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 WC-HANFORD RC-030 K1320

DATE RECEIVED: 09/05/08

LVL LOT # :0809L035

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 REP	SO	08L0338	09/03/08	09/17/08	09/18/08
ZINC, TOTAL	001 MS	SO	08L0338	09/03/08	09/17/08	09/18/08
J17H01						
SILVER, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
ALUMINUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
ARSENIC, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
BORON, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
BARIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
BERYLLIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
CALCIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
CADMIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
COBALT, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
CHROMIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
COPPER, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
IRON, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
MERCURY, TOTAL	002	SO	08C0157	09/03/08	09/10/08	09/10/08
POTASSIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
MAGNESIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
MANGANESE, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
MOLYBDENUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
SODIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
NICKEL, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
LEAD, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
ANTIMONY, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
SELENIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
SILICON, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
VANADIUM, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08
ZINC, TOTAL	002	SO	08L0338	09/03/08	09/17/08	09/18/08

LAB QC:

SILVER LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
SILVER, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
ALUMINUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
ALUMINUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
ARSENIC LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 WC-HANFORD RC-030 K1320

DATE RECEIVED: 09/05/08

LVL LOT # :0809L035

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
BORON LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
BORON, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
BARIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
BARIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
BERYLLIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
BERYLLIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
CALCIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
CALCIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
CADMIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
CADMIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
COBALT LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
COBALT, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
CHROMIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
CHROMIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
COPPER LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
COPPER, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
IRON LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
IRON, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
MERCURY LABORATORY	LC1 BS	S	08C0157	N/A	09/10/08	09/10/08
MERCURY, TOTAL	MB1	S	08C0157	N/A	09/10/08	09/10/08
POTASSIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
POTASSIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
MAGNESIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
MAGNESIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
MANGANESE LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
MANGANESE, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
MOLYBDENUM LABORATOR	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
MOLYBDENUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
SODIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
SODIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
NICKEL LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
NICKEL, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
LEAD LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
LEAD, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
ANTIMONY LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
ANTIMONY, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
SELENIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
WC-HANFORD RC-030 K1320

DATE RECEIVED: 09/05/08

LVL LOT # :0809L035

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
SILICON LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
SILICON, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
VANADIUM LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
VANADIUM, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08
ZINC LABORATORY	LC1 BS	S	08L0338	N/A	09/17/08	09/18/08
ZINC, TOTAL	MB1	S	08L0338	N/A	09/17/08	09/18/08



## Analytical Report

Client: WC-HANFORD RC-030  
LVL#: 0809L035  
SDG/SAF#: K1320/RC-030

W.O.#: 60049-001-001-0001-00  
Date Received: 09-05-08

### METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) 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 methods checked on the attached glossary.

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

The samples were run on a different instrument for Aluminum, Potassium and Sodium due to sample matrix.

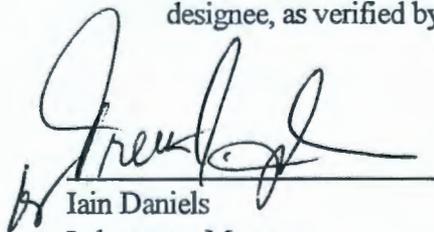
3. All analyses were performed within the required holding times.
4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
  - a). The MB result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and all samples read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample result was reported herein "uncorrected" for the levels found in the MB.
7. All ICP Interference Check Standards were within control limits.

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 21 pages.

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon (20%). Sample results for Silicon may be biased low. Refer to the Inorganics Laboratory Control Standards Report.
9. All matrix spike (MS) recoveries for 8 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
10. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J17H00	Aluminum	126,000	97.5
	Iron	60,000	94.9
	Antimony	300	106.6
	Manganese	3,000	108.5
	Chromium	300	101.2
	Lead	300	98.7
	Silicon	6,300	101.5
	Zinc	300	91.9

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.
13. LvLI is NELAP accredited by the state of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
 Iain Daniels  
 Laboratory Manager  
 Lionville Laboratory Incorporated

9/21/08  
 Date



# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within the

lot#: 08091035  
 Leaching Procedure: 1310 1311 1312 Other: \_\_\_\_\_

LP Metals Digestion and Analysis Methods: ILM03.0 ILM04.0

Metals Digestion Methods: 3005A 3010A 3015 3020A  3050B 3051 200.7 SS17  
Other: \_\_\_\_\_

## Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Antimony	<input checked="" type="checkbox"/> 6010B <u>7041</u> <sup>s</sup>	<u>200.7</u> <u>204.2</u>			<u>99</u>
Arsenic	<input checked="" type="checkbox"/> 6010B <u>7060A</u> <sup>s</sup>	<u>200.7</u> <u>206.2</u>	<u>3113B</u>		<u>99</u>
Barium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Beryllium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>		<u>1620</u>	<u>99</u>
Bismuth	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7</u> <sup>1</sup>			<u>99</u>
Boron	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Cadmium	<input checked="" type="checkbox"/> 6010B <u>7131A</u> <sup>s</sup>	<u>200.7</u> <u>213.2</u>			<u>99</u>
Calcium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>SS17</u>
Chromium	<input checked="" type="checkbox"/> 6010B <u>7191</u> <sup>s</sup>	<u>200.7</u> <u>218.2</u>			<u>99</u>
Cobalt	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Copper	<input checked="" type="checkbox"/> 6010B <u>7211</u> <sup>s</sup>	<u>200.7</u> <u>220.2</u>			<u>99</u>
Iron	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Lead	<input checked="" type="checkbox"/> 6010B <u>7421</u> <sup>s</sup>	<u>200.7</u> <u>239.2</u>	<u>3113B</u>		<u>99</u>
Lithium	<input checked="" type="checkbox"/> 6010B <u>7430</u> <sup>s</sup>	<u>200.7</u>		<u>1620</u>	<u>99</u>
Magnesium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Manganese	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Mercury	<input checked="" type="checkbox"/> 7470A <input checked="" type="checkbox"/> <u>7471A</u> <sup>s</sup>	<u>245.1</u> <sup>2</sup> <u>245.5</u> <sup>2</sup>			<u>99</u>
Molybdenum	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Nickel	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Potassium	<input checked="" type="checkbox"/> 6010B <u>7610</u> <sup>s</sup>	<u>200.7</u> <u>258.1</u> <sup>s</sup>			<u>99</u>
Rare Earths	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7</u> <sup>1</sup>		<u>1620</u>	<u>99</u>
Selenium	<input checked="" type="checkbox"/> 6010B <u>7740</u> <sup>s</sup>	<u>200.7</u> <u>270.2</u>	<u>3113B</u>		<u>99</u>
Silicon	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7</u>		<u>1620</u>	<u>99</u>
Silica	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>		<u>1620</u>	<u>99</u>
Silver	<input checked="" type="checkbox"/> 6010B <u>7761</u> <sup>s</sup>	<u>200.7</u> <u>272.2</u>			<u>99</u>
Sodium	<input checked="" type="checkbox"/> 6010B <u>7770</u> <sup>s</sup>	<u>200.7</u> <u>273.1</u> <sup>s</sup>			<u>99</u>
Strontium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Thallium	<input checked="" type="checkbox"/> 6010B <u>7841</u> <sup>s</sup>	<u>200.7</u> <u>279.2</u> <u>200.9</u>			<u>99</u>
Tin	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Titanium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>		<u>1620</u>	<u>99</u>
Uranium	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7</u> <sup>1</sup>			<u>99</u>
Vanadium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Zinc	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>		<u>1620</u>	<u>99</u>
Zirconium	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7</u> <sup>1</sup>			<u>99</u>

Method:

0000000000

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

- MB = Method or Preparation Blank.  
MS = Matrix Spike.  
MSD = Matrix Spike Duplicate.  
REP = Sample Replicate.  
LCS = Laboratory Control Sample.  
NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
 WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J17H00	Silver, Total	0.30	u MG/KG	0.30	3.0
		Aluminum, Total	7460	MG/KG	12.0	3.0
		Arsenic, Total	6.2	MG/KG	1.5	3.0
		Boron, Total	6.9	MG/KG	1.5	3.0
		Barium, Total	124	MG/KG	0.30	3.0
		Beryllium, Total	0.23	MG/KG	0.15	3.0
		Calcium, Total	6140	MG/KG	12.0	3.0
		Cadmium, Total	1.0	MG/KG	0.15	3.0
		Cobalt, Total	6.1	MG/KG	0.60	3.0
		Chromium, Total	27.4	MG/KG	0.60	3.0
		Copper, Total	34.0	MG/KG	0.60	3.0
		Iron, Total	19600	MG/KG	13.5	3.0
		Mercury, Total	0.05	MG/KG	0.01	1.0
		Potassium, Total	1810	MG/KG	147	3.0
		Magnesium, Total	3950	MG/KG	7.5	3.0
		Manganese, Total	218	MG/KG	0.12	3.0
		Molybdenum, Total	0.94	MG/KG	0.90	3.0
		Sodium, Total	311	MG/KG	6.0	3.0
		Nickel, Total	14.4	MG/KG	0.60	3.0
		Lead, Total	97.7	MG/KG	0.90	3.0
		Antimony, Total	0.90	u MG/KG	0.90	3.0
		Selenium, Total	1.8	u MG/KG	1.8	3.0
		Silicon, Total	561	MG/KG	12.0	3.0
		Vanadium, Total	40.9	MG/KG	0.42	3.0
		Zinc, Total	204	MG/KG	1.8	3.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
 WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J17H01	Silver, Total	0.29	u MG/KG	0.29	3.0
		Aluminum, Total	8880	MG/KG	11.7	3.0
		Arsenic, Total	7.4	MG/KG	1.5	3.0
		Boron, Total	6.3	MG/KG	1.5	3.0
		Barium, Total	112	MG/KG	0.29	3.0
		Beryllium, Total	0.25	MG/KG	0.15	3.0
		Calcium, Total	20200	MG/KG	11.7	3.0
		Cadmium, Total	1.3	MG/KG	0.15	3.0
		Cobalt, Total	6.9	MG/KG	0.59	3.0
		Chromium, Total	21.2	MG/KG	0.59	3.0
		Copper, Total	22.3	MG/KG	0.59	3.0
		Iron, Total	19900	MG/KG	13.2	3.0
		Mercury, Total	0.02	MG/KG	0.01	1.0
		Potassium, Total	1630	MG/KG	144	3.0
		Magnesium, Total	6080	MG/KG	7.3	3.0
		Manganese, Total	305	MG/KG	0.12	3.0
		Molybdenum, Total	0.88	u MG/KG	0.88	3.0
		Sodium, Total	397	MG/KG	5.9	3.0
		Nickel, Total	17.0	MG/KG	0.59	3.0
		Lead, Total	33.5	MG/KG	0.88	3.0
		Antimony, Total	1.1	MG/KG	0.88	3.0
		Selenium, Total	1.8	u MG/KG	1.8	3.0
		Silicon, Total	441	MG/KG	11.7	3.0
		Vanadium, Total	41.7	MG/KG	0.41	3.0
		Zinc, Total	312	MG/KG	1.8	3.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
 WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0338-MB1	Silver, Total	0.16	MG/KG	0.10	1.0
		Aluminum, Total	4.0	u MG/KG	4.0	1.0
		Arsenic, Total	0.50	u MG/KG	0.50	1.0
		Boron, Total	0.50	u MG/KG	0.50	1.0
		Barium, Total	0.13	MG/KG	0.10	1.0
		Beryllium, Total	0.05	u MG/KG	0.05	1.0
		Calcium, Total	6.6	MG/KG	4.0	1.0
		Cadmium, Total	0.06	MG/KG	0.05	1.0
		Cobalt, Total	0.20	u MG/KG	0.20	1.0
		Chromium, Total	0.25	MG/KG	0.20	1.0
		Copper, Total	0.20	u MG/KG	0.20	1.0
		Iron, Total	5.5	MG/KG	4.5	1.0
		Potassium, Total	49.3	u MG/KG	49.3	1.0
		Magnesium, Total	3.1	MG/KG	2.5	1.0
		Manganese, Total	0.45	MG/KG	0.04	1.0
		Molybdenum, Total	0.30	u MG/KG	0.30	1.0
		Sodium, Total	22.1	MG/KG	2.0	1.0
		Nickel, Total	0.20	u MG/KG	0.20	1.0
		Lead, Total	0.30	u MG/KG	0.30	1.0
		Antimony, Total	0.30	u MG/KG	0.30	1.0
		Selenium, Total	0.60	u MG/KG	0.60	1.0
		Silicon, Total	4.0	u MG/KG	4.0	1.0
		Vanadium, Total	0.14	u MG/KG	0.14	1.0
		Zinc, Total	0.60	u MG/KG	0.60	1.0
BLANK1	08C0157-MB1	Mercury, Total	0.01	u MG/KG	0.01	1.0

## Lionville Laboratory, Inc.

## INORGANICS ACCURACY REPORT 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
 WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J17H00	Silver, Total	4.9	0.30u	4.9	100	3.0
		Aluminum, Total	8440	7460	198	496.2*	3.0
		Arsenic, Total	194	6.2	198	94.6	3.0
		Boron, Total	93.5	6.9	99.0	87.5	3.0
		Barium, Total	290	124	198	83.5	3.0
		Beryllium, Total	4.9	0.23	4.9	95.3	3.0
		Calcium, Total	8730	6140	2480	104.6	3.0
		Cadmium, Total	5.7	1.0	4.9	95.9	3.0
		Cobalt, Total	53.6	6.1	49.5	96.0	3.0
		Chromium, Total	40.4	27.4	19.8	65.7	3.0
		Copper, Total	60.0	34.0	24.8	104.8	3.0
		Iron, Total	20500	19600	99.0	894.1*	3.0
		Mercury, Total	0.28	0.05	0.21	108.3	1.0
		Potassium, Total	4080	1810	2480	91.6	3.0
		Magnesium, Total	6300	3950	2480	95.0	3.0
		Manganese, Total	290	218	49.5	147.3*	3.0
		Molybdenum, Total	92.7	0.94	99.0	92.7	3.0
		Sodium, Total	2690	311	2480	96.3	3.0
		Nickel, Total	63.0	14.4	49.5	98.2	3.0
		Lead, Total	100	97.7	49.5	5.3	3.0
		Antimony, Total	20.1	0.90u	49.5	40.6	3.0
		Selenium, Total	162	1.8 u	198	81.9	3.0
		Silicon, Total	606	561	99.0	44.9*	3.0
		Vanadium, Total	87.8	40.9	49.5	94.7	3.0
		Zinc, Total	214	204	49.5	19.2*	3.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
 WORK ORDER: 60049-001-001-6001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		
-001REP	J17H00	Silver, Total	0.30u	0.29u	NC	3.0
		Aluminum, Total	7460	7480	0.31	3.0
		Arsenic, Total	6.2	6.9	10.7	3.0
		Boron, Total	6.9	7.8	12.2	3.0
		Barium, Total	124	103	18.9	3.0
		Beryllium, Total	0.23	0.22	4.9	3.0
		Calcium, Total	6140	6100	0.68	3.0
		Cadmium, Total	1.0	0.98	2.3	3.0
		Cobalt, Total	6.1	6.3	3.2	3.0
		Chromium, Total	27.4	22.5	19.6	3.0
		Copper, Total	34.0	37.4	9.5	3.0
		Iron, Total	19600	20400	4.0	3.0
		Mercury, Total	0.05	0.06	9.0	1.0
		Potassium, Total	1810	1920	5.5	3.0
		Magnesium, Total	3950	3960	0.13	3.0
		Manganese, Total	218	227	4.2	3.0
		Molybdenum, Total	0.94	0.88u	NC 200*	3.0
		Sodium, Total	311	328	5.2	3.0
		Nickel, Total	14.4	16.1	11.1	3.0
		Lead, Total	97.7	57.4	52.0	3.0
		Antimony, Total	0.90u	0.88u	NC	3.0
		Selenium, Total	1.8 u	1.8 u	NC	3.0
		Silicon, Total	561	520	7.5	3.0
		Vanadium, Total	40.9	41.5	1.5	3.0
		Zinc, Total	204	177	14.0	3.0

\*  
 Corrected RPD  
 Aem 9/22/08

## Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/22/08

CLIENT: WC-HANFORD RC-030 K1320  
WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L035

SAMPLE	SITE ID	ANALYTE	SPIKED		UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	08L0338-LC1	Silver, LCS	48.3	50.0	MG/KG	96.6
		Aluminum, LCS	456	500	MG/KG	91.3
		Arsenic, LCS	935	1000	MG/KG	93.5
		Boron, LCS	454	500	MG/KG	90.7
		Barium, LCS	474	500	MG/KG	94.8
		Beryllium, LCS	24.3	25.0	MG/KG	97.2
		Calcium, LCS	2450	2500	MG/KG	98.2
		Cadmium, LCS	23.8	25.0	MG/KG	95.2
		Cobalt, LCS	240	250	MG/KG	96.0
		Chromium, LCS	48.8	50.0	MG/KG	97.6
		Copper, LCS	121	125	MG/KG	96.9
		Iron, LCS	516	500	MG/KG	103.2
		Potassium, LCS	2200	2500	MG/KG	88.1
		Magnesium, LCS	2370	2500	MG/KG	94.9
		Manganese, LCS	73.7	75.0	MG/KG	98.3
		Molybdenum, LCS	482	500	MG/KG	96.4
		Sodium, LCS	2250	2500	MG/KG	90.1
		Nickel, LCS	194	200	MG/KG	96.8
		Lead, LCS	242	250	MG/KG	96.8
		Antimony, LCS	281	300	MG/KG	93.5
		Selenium, LCS	891	1000	MG/KG	89.1
		Silicon, LCS	100	500	MG/KG	20.0
		Vanadium, LCS	240	250	MG/KG	96.2
		Zinc, LCS	96.5	100	MG/KG	96.5
LCS1	08C0157-LC1	Mercury, LCS	4.7	4.7	MG/KG	99.3

000000015



MERCURY PREPARATION

Analyst: UES  
Date: 9/10/08  
Start Time/Temp: 1005 / 92°  
End Time/Temp: 1235 / 92°

Instrument ID: HG32  
Balance #: B29 / NA  
Pipette Calibration (Daily): Y ✓

Logbook #: 498  
Prep Batch: 08C0157  
Worksheet: HG-091002  
SOP No.: ME-HgCVAA, Rev. 02

pH < 2 for Liquids? Yes/No (If no: designate affected samples in Comments column, and initiate an SDR)

NOTE: The Initial/Final Volume for water samples = 33mL, unless otherwise noted.  
The Final volume for soil samples = 50mL, unless otherwise noted.

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.			
Blank	500			10mL	50mL				
0.2 µg/L	3VG	0.100							
1.0	PC	0.500							
2.0	Gd	1.000							
5.0	R	2.500							
10.0	11A	5.000							
1CV	H3	0.125	2.5						
CCV	8	0.250	5.0						
1CB/CCB	PA/NS							9.80L	
MBI	JC						0.30	PBS157	100.0
LCL	NR	*	*				0.30	LCSS157	I
0809L034-001	1721			0.33	R	95.30			
WR	K17			0.38		I			
W15	6J	0.500	1.0	0.35		I			
0809L006-001	L15			0.33		100.00			
WR	NB			0.39		I			
0015	E7	0.500	1.0	0.33		I			
0809L021-001	31			0.41		99.98			
002	S37			0.31		96.97			
002R	N2			0.35		I			
002S	KX	0.500	1.0	0.31		I			
003	P3			0.31		96.99			
004	CM			0.31		92.34			
0809L022-001	S14			0.31		99.97			
002	AP			0.32		98.08			
002R	114			0.36		I			
002S	816	0.500	1.0	0.32		I			

Standard:	ID	Prep Date/Time
CAL/MS	R1 6072-78-14B	9/10/08 0730
CV/CCV/LCS	US 6072-78-15A	I

Reviewed By/Date: [Signature] 9/12/08  
see book # 9368 for std traceability information

Soil LCS = US Metals in soil No.3; True Value = 4.70 mg/Kg  
Catalogue #1RM-021, Lot # E021

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

MERCURY PREPARATION

Analyst: EA  
 Date: 9/10/08  
 Start Time/Temp: \_\_\_\_\_  
 End Time/Temp: See page 016

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

Logbook #: 498  
 Prep Batch: 08C0157  
 Worksheet: HG091002  
 SOP No.: ME-HgCVAA, Rev. 02

pH < 2 for Liquids? NA Yes NA No (If no: designate affected samples in Comments column, and initiate an SDR)  
 NOTE: The Initial/Final Volume for water samples = 33mL, unless otherwise noted.  
 The Final volume for soil samples = 50mL, unless otherwise noted.

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.	
0809L022-003	P1			0.35	50mL	98.07	
0809L035-001	40			0.31		78.28	
WIR	LS3			0.32			
WIS	UT	0.500	1.0	0.31			
002	205			0.35			
0809L036-001	DX			0.36			98.31
WIR	H2			0.32			
WIS	41	0.500	1.0	0.37			
002	RU			0.31			97.75
W3	194			0.41			99.95

*EA 9/10/08*

Standard:	ID	Prep Date/Time
CAL/MS		
CV/CCV/LCS	<u>See page 016</u>	

Reviewed By/Date: M. White 9/12/08  
 see book # 9368 for std traceability information

Soil LCS = US Metals in soil No.3; True Value = 4.70 mg/Kg  
 Catalogue #1RM-021, Lot # E021

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



Collector <i>WELCH-KOELLING</i>	Company Contact Matt Perrott	Telephone No. 372-9088	Project Coordinator KESSNER, JH	Price Code 9C	Data Turnaround 15 Days
Object Designation Remaining Sites Confirmation Sampling - Other Solid	Sampling Location 100-H-28:6	SAF No. RC-030			
Field Chest No. <i>AFS-04-054</i>	Field Logbook No. EL-1601-2	COA CO0H28A000	Method of Shipment <i>Fed Ex</i>		
Shipped To <u>BERLINE SERVICES (LIONVILLE)</u>	Offsite Property No. <i>A080345</i>	Bill of Lading/Air Bill No. <i>see OSPC</i>			

Special Handling and/or Storage	Preservation	None	None	Cool 4C
	Type of Container	G/P	G/P	aG
	No. of Container(s)	<i>1</i>	<i>1</i>	<i>1</i>
	Volume	500mL	60mL	60mL

SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	PCBs - 8082; <del>Demetals - 8007</del> <i>BH 9/3/08</i>
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Sample No.	Matrix *	Sample Date	Sample Time		
7H00	OTHER SOLID	9/3/08	0900	X	X
7H01	OTHER SOLID	9/3/08	0915	X	X
7H02	OTHER SOLID				
7H03	OTHER SOLID				
7H04 <i>BH 9/3/08</i>	OTHER SOLID				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix * So=Soil SE=Soil/element SO=Solid Sl=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other
Acquired By/Removed From <i>WELCH-KOELLING</i>	Date/Time <i>9/3/08 1115</i>	Received By/Stored In <i>BHUDSON</i>	Date/Time <i>9/3/08 1115</i>	<i>BH 9/3/08</i> (1) Gamma Spectroscopy (TCL List) (Cerium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Americium-241, Gross Alpha, Gross Beta) (2) ICP Metals - 6010TR (Client 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)		
Acquired By/Removed From <i>BHUDSON</i>	Date/Time <i>9/3/08 1630</i>	Received By/Stored In <i>1060 #3C</i>	Date/Time <i>9/3/08 1630</i>			
Acquired By/Removed From <i>360/9C</i>	Date/Time <i>9/4/08 0900</i>	Received By/Stored In <i>MSTANKOVICH</i>	Date/Time <i>9/4/08 0900</i>			
Acquired By/Removed From <i>WELCH</i>	Date/Time <i>9/4/08 0900</i>	Received By/Stored In <i>Fed Ex</i>	Date/Time			
Acquired By/Removed From <i>Fed Ex</i>	Date/Time <i>9.5.08/0950</i>	Received By/Stored In <i>WELCH</i>	Date/Time <i>9.5.08/0950</i>			
Acquired By/Removed From	Date/Time	Received By/Stored In	Date/Time			Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

000000020

Lionville Laboratory Incorporated  
**SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: WC. Hanford  
 Project/SAF/SOW/Release #: RC-030

Date: 9-5-08

LvLI Batch #: 0809L035

Sample Custodian: D. Yarnes

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |  |   |
|---|--|---|
| 1. Samples Hand Delivered or <u>Shipped?</u>  | Carrier <u>Ex</u>  | Airbill # <u>7980 0576 1115</u>                       |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> No Seals                     |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | Comments:   |
| 4. All expected paperwork received (coc & other client specific information) sealed in plastic bag and easily accessible?                   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 5. Samples received <u>cooled</u> or ambient?   | Temp <u>2.2</u> °C   | Cooler # <u>AFS-04-054</u>                            |
| How was the temperature taken?  | <input checked="" type="checkbox"/> IR <input type="checkbox"/> Temp. Blank  | <input type="checkbox"/> Other (Specify):             |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> No Seals                     |
| 7. COC (Client & LvLI) signed & dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 9. All samples on COC received?<br>All samples received on COC?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |
| 10. All sample label information matches COC?   | <del><input checked="" type="checkbox"/> Yes</del> <input checked="" type="checkbox"/> No  | <u>001A + 002A</u><br>Label indicates<br>PCBs + Pes-  |
| 11. Samples properly preserved? (If #5 is no, then this is no.)   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 12. Samples received within hold times?<br>Short holds taken to wet lab?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> Yes <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A               |
| 13. VOA, TOC, TOX free of headspace?  | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A               |
| 14. QC stickers placed on bottles designated by client?   | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A               |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  |   |
| 16. Project Manager contacted concerning any discrepancies?<br>Person Contacted _____   | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input checked="" type="checkbox"/> N/A<br>Date _____ |

