

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

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt H4-21

KW 3/26/08  
INITIAL/DATE

**COMMENTS:**

**SDG K1130**

**SAF-RC-030**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 100-F-51**

**RECEIVED**  
APR 02 2008

**EDMC**



**EBERLINE**  
SERVICES



March 24, 2008

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

Reference: **P.O. #630**  
**Eberline Services R8-02-139-7776, SDG K1130**

Dear Ms. Kessner:

Enclosed is the data report for one solid (other solid) sample designated under SAF No. RC-030 received at Eberline Services on February 22, 2008. The sample was 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

Analytical Services  
2030 Wright Avenue  
P.O. Box 4040  
Richmond, California 94804-0040  
(510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

**1.0 GENERAL**

Washington Closure Hanford (WCH) Sample Delivery Group K1130 was composed of one solid (other solid) sample designated under SAF No. RC-030 with a Project Designation of: Remaining Site Confirmation Sampling-Other Solid.

The sample was 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 March 6, and 21, 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 Carbon-14 Analysis**

No problems were encountered during the course of the reanalyses.

**2.3 Nickel-63 Analysis**

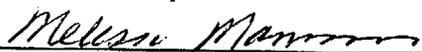
No problems were encountered during the course of the analyses.

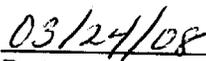
**2.4 Gamma Spectroscopy**

No problems were encountered during the course of the analyses.

**3.0 Case Narrative Certification Statement**

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

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

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP K1130

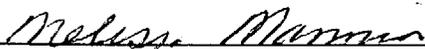
SDG 7776  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_K1130

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

T A B L E   O F   C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	11
Report Guides	.	.	.	16
End of Section	.	.	.	30

  
Prepared by

  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K1130

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

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

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SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG K1130

ABOUT THE DATA SUMMARY SECTION

DUPPLICATES

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

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG K1130

LAB	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R802139-01	J169J5	100-F-51	SOLID		RC-030	RC-030-070	02/20/08 09:00
R802139-02	Lab Control Sample		SOLID		RC-030		
R802139-03	Method Blank		SOLID		RC-030		
R802139-04	Duplicate (R802139-01)	100-F-51	SOLID		RC-030		02/20/08 09:00

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LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LS  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

QC SUMMARY

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
776	RC-030-070	J169J5	SOLID	100.0	135 g		02/22/08	2	R802139-01	7776-001
		Method Blank	SOLID						R802139-03	7776-003
		Lab Control Sample	SOLID						R802139-02	7776-002
		Duplicate (R802139-01)	SOLID	100.0	135 g		02/22/08	2	R802139-04	7776-004

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QC SUMMARY

Page 1

IMMARY DATA SECTION

Page 4

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 03/21/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
<b>Gas Proportional Counting</b>										
93A	SOLID	Gross Alpha in Solids	6148-022	20.0	1			1	1	1/1
93B	SOLID	Gross Beta in Solids	6148-022	15.0	1			1	1	1/1
<b>Gamma Spectroscopy</b>										
GAM	SOLID	Gamma Scan	6148-022	15.0	1			1	1	1/1
<b>Liquid Scintillation Counting</b>										
C	SOLID	Carbon 14 in Solids	6148-022	10.0	1			1	1	1/1
NI_L	SOLID	Nickel 63 in Solids	6148-022	10.0	1			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.

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 Version 3.06  
 Report date 03/21/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

**LAB WORK SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
302139-01 02/20/08 02/22/08	J169J5 100-F-51 RC-030-070	SOLID RC-030	7776-001	93A/93	03/03/08	03/03/08	BW	Gross Alpha in Solids		
			7776-001	93B/93	03/03/08	03/03/08	BW	Gross Beta in Solids		
			7776-001	C	03/17/08	03/20/08	BW	Carbon 14 in Solids		
			7776-001	GAM	03/03/08	03/04/08	CSS	Gamma Scan		
			7776-001	NI_L	02/28/08	03/04/08	BW	Nickel 63 in Solids		
302139-02	Lab Control Sample RC-030	SOLID	7776-002	93A/93	03/03/08	03/03/08	BW	Gross Alpha in Solids		
			7776-002	93B/93	03/03/08	03/03/08	BW	Gross Beta in Solids		
			7776-002	C	03/17/08	03/20/08	BW	Carbon 14 in Solids		
			7776-002	GAM	03/03/08	03/04/08	CSS	Gamma Scan		
			7776-002	NI_L	02/28/08	03/04/08	BW	Nickel 63 in Solids		
302139-03	Method Blank RC-030	SOLID	7776-003	93A/93	03/03/08	03/03/08	BW	Gross Alpha in Solids		
			7776-003	93B/93	03/03/08	03/03/08	BW	Gross Beta in Solids		
			7776-003	C	03/17/08	03/20/08	BW	Carbon 14 in Solids		
			7776-003	GAM	03/03/08	03/04/08	CSS	Gamma Scan		
			7776-003	NI_L	02/28/08	03/04/08	BW	Nickel 63 in Solids		
302139-04	Duplicate (R802139-01) 100-F-51 RC-030	SOLID	7776-004	93A/93	03/03/08	03/03/08	BW	Gross Alpha in Solids		
			7776-004	93B/93	03/03/08	03/03/08	BW	Gross Beta in Solids		
			7776-004	C	03/17/08	03/20/08	BW	Carbon 14 in Solids		
			7776-004	GAM	03/03/08	03/04/08	CSS	Gamma Scan		
			7776-004	NI_L	02/28/08	03/04/08	BW	Nickel 63 in Solids		

**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	1			1	1	1		4
93B/93	RC-030	Gross Beta in Solids	900.0_ALPHABETA_GPC	1			1	1	1		4
C	RC-030	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1		4
GAM	RC-030	Gamma Scan	GAMMA_GS	1			1	1	1		4
NI_L	RC-030	Nickel 63 in Solids	NI63_LSC	1			1	1	1		4
<b>TOTALS</b>				<b>5</b>			<b>5</b>	<b>5</b>	<b>5</b>		<b>20</b>

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WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 03/21/08

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K1130**

7776-003

Method Blank

**METHOD BLANK**

SDG <u>7776</u>	Client/Case no <u>Hanford</u>	<u>SDG K1130</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R802139-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7776-003</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	-0.598	2.1	5.73	10.0	U	93A
Gross Beta	12587-47-2	-1.97	3.0	5.59	15.0	U	93B
Carbon 14	14762-75-5	0.519	2.2	3.63	50.0	U	C
Nickel 63	13981-37-8	-1.60	<u>2.6</u>	1.88	30.0	U	NI_L
Potassium 40	13966-00-2	U		0.359		U	GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Cesium 137	10045-97-3	U		0.034	0.100	U	GAM
Radium 226	13982-63-3	U		0.066	0.100	U	GAM
Radium 228	15262-20-1	U		0.134	0.200	U	GAM
Europium 152	14683-23-9	U		0.087	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.104</u>	0.100	U	GAM
Europium 155	14391-16-3	U		0.064	0.100	U	GAM
Thorium 228	14274-82-9	U		0.050		U	GAM
Thorium 232	TH-232	U		0.134		U	GAM
Uranium 235	15117-96-1	U		0.112		U	GAM
Uranium 238	U-238	U		4.15		U	GAM
Americium 241	14596-10-2	U		0.037		U	GAM

RemainSitesConfirmSamp- Other Solid

QC-BLANK #64840

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/21/08</u>

**METHOD BLANKS**

Page 1

**SUMMARY DATA SECTION**

Page 7

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

7776-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7776</u>	Client/Case no <u>Hanford</u>	<u>SDG K1130</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R802139-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7776-002</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 LMITS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	134	19	7.16	10.0	93A	102	4.1	<u>131</u>	51-149	70-130
Gross Beta	90.9	8.1	8.61	15.0	93B	93.8	3.8	97	74-126	80-120
Carbon 14	1510	14	3.34	50.0	C	1600	64	94	85-115	80-120
Nickel 63	201	4.6	1.88	30.0	NI_L	222	8.9	91	85-115	80-120
Cobalt 60	1.77	0.12	<u>0.088</u>	0.050	GAM	1.80	0.072	98	75-125	80-120
Cesium 137	2.00	0.12	0.094	0.100	GAM	1.90	0.076	105	74-126	80-120

RemainSitesConfirmSamp- Other Solid

QC-LCS #64839
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>03/21/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1130

7776-004

J169J5

**DUPLICATE**

SDG <u>7776</u>	Client/Case no <u>Hanford</u> SDG <u>K1130</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>
<b>DUPLICATE</b>	<b>ORIGINAL</b>
Lab sample id <u>R802139-04</u>	Lab sample id <u>R802139-01</u> Client sample id <u>J169J5</u>
Dept sample id <u>7776-004</u>	Dept sample id <u>7776-001</u> Location/Matrix <u>100-F-51</u> <u>SOLID</u>
	Received <u>02/22/08</u> Collected/Weight <u>02/20/08 09:00</u> <u>135 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-030-070</u> <u>RC-030</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER	
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	σ
Gross Alpha	15.6	6.5	5.54	10.0		93A	18.2	7.1	6.10	15	95	0.5	
Gross Beta	20.7	4.6	5.91	15.0		93B	18.8	5.8	8.75	10	65	0.4	
Carbon 14	0.918	1.8	2.92	50.0	U	C	0.028	1.8	2.96	U	-	0.7	
Nickel 63	15.6	3.4	2.21	30.0		NI_L	16.1	3.3	2.17		3	50	0.2
Potassium 40	10.5	0.60	0.389			GAM	9.97	0.96	0.563		5	36	0.4
Cobalt 60	2.23	0.085	<u>0.055</u>	0.050		GAM	2.05	0.13	<u>0.079</u>		8	34	0.7
Cesium 137	0.090	0.050	0.062	0.100		GAM	0.092	0.063	0.083		2	136	0
Radium 226	0.800	0.11	<u>0.105</u>	0.100		GAM	0.842	0.15	<u>0.159</u>		5	47	0.3
Radium 228	0.600	0.20	<u>0.238</u>	0.200		GAM	0.673	0.37	<u>0.417</u>		11	104	0.3
Europium 152	3.62	0.13	<u>0.130</u>	0.100		GAM	3.16	0.18	<u>0.183</u>		14	33	1.2
Europium 154	U		<u>0.401</u>	0.100	U	GAM	U		<u>0.505</u>	U	-		0.3
Europium 155	U		<u>0.110</u>	0.100	U	GAM	U		<u>0.166</u>	U	-		0.6
Thorium 228	0.581	0.054	0.063			GAM	0.722	0.083	0.096		22	39	1.7
Thorium 232	0.600	0.20	0.238			GAM	0.673	0.37	0.417		11	104	0.3
Uranium 235	U		0.176		U	GAM	U		0.256	U	-		0.5
Uranium 238	U		7.11		U	GAM	U		10.8	U	-		0.6

RemainSitesConfirmSamp- Other Solid

QC-DUP#1 64841

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>03/21/08</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP K1130

7776-001

J169J5

DATA SHEET

SDG <u>7776</u>	Client/Case no <u>Hanford</u>	SDG <u>K1130</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R802139-01</u>	Client sample id <u>J169J5</u>	
Dept sample id <u>7776-001</u>	Location/Matrix <u>100-F-51</u>	<u>SOLID</u>
Received <u>02/22/08</u>	Collected/Weight <u>02/20/08 09:00</u>	<u>135 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-030-070</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	18.2	7.1	6.10	10.0		93A
Gross Beta	12587-47-2	18.8	5.8	8.75	15.0		93B
Carbon 14	14762-75-5	0.028	1.8	2.96	50.0	U	C
Nickel 63	13981-37-8	16.1	3.3	2.17	30.0		NI_L
Potassium 40	13966-00-2	9.97	0.96	0.563			GAM
Cobalt 60	10198-40-0	2.05	0.13	<u>0.079</u>	0.050		GAM
Cesium 137	10045-97-3	0.092	0.063	0.083	0.100		GAM
Radium 226	13982-63-3	0.842	0.15	<u>0.159</u>	0.100		GAM
Radium 228	15262-20-1	0.673	0.37	<u>0.417</u>	0.200		GAM
Europium 152	14683-23-9	3.16	0.18	<u>0.183</u>	0.100		GAM
Europium 154	15585-10-1	U		<u>0.505</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.166</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.722	0.083	0.096			GAM
Thorium 232	TH-232	0.673	0.37	0.417			GAM
Uranium 235	15117-96-1	U		0.256		U	GAM
Uranium 238	U-238	U		10.8		U	GAM

RemainSitesConfirmSamp- Other Solid

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 10

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/21/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

Test 93A Matrix SOLID  
 SDG 7776  
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN SOLIDS  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG K1130

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Alpha
Preparation batch 6148-022					
02139-01	93	7776-001	J169J5		18.2
02139-02	93	7776-002	Lab Control Sample		HIGH
02139-03	93	7776-003	Method Blank		U
02139-04	93	7776-004	Duplicate (R802139-01)		ok
Minimal values and limits from method RDLs (pCi/g) 10.0					
MainSitesConfirmSamp- Other Solid					

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 6148-022 2σ prep error 20.0 % Reference Lab Notebook #6148, pg. 22															
02139-01	93	J169J5	6.10	0.100			46	100			12	02/28/08	03/03	GRB-213	
02139-02	93	Lab Control Sample	7.16	0.100			61	100				02/28/08	03/03	GRB-214	
02139-03	93	Method Blank	5.73	0.100			61	100				02/28/08	03/03	GRB-216	
02139-04	93	Duplicate (R802139-01)	5.54	0.100			47	100			12	02/28/08	03/03	GRB-105	
Minimal values and limits from method 10.0 0.100 5-250 100 180															

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 SPP-125 Gross Alpha and Gross Beta in Dissolved Solids, rev 0

AVERAGES ± 2 SD MDA 6.13 ± 1.45  
 FOR 4 SAMPLES RESIDUE 54 ± 17

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 03/21/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1130

Test 93B Matrix SOLID  
 SDG 7776  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

GROSS BETA IN SOLIDS  
 GAS PROPORTIONAL COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG K1130

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Beta
Preparation batch 6148-022					
02139-01	93	7776-001	J169J5		18.8
02139-02	93	7776-002	Lab Control Sample		ok
02139-03	93	7776-003	Method Blank		U
02139-04	93	7776-004	Duplicate (R802139-01)		ok

Minimal values and limits from method RDLs (pCi/g) 15.0  
 mainSitesConfirmSamp- Other Solid

**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 6148-022 2σ prep error 15.0 % Reference Lab Notebook #6148, pg. 22													
02139-01	93	J169J5	8.75	0.100			46	100			12	02/28/08	03/03 GRB-213
02139-02	93	Lab Control Sample	8.61	0.100			61	100				02/28/08	03/03 GRB-214
02139-03	93	Method Blank	5.59	0.100			61	100				02/28/08	03/03 GRB-216
02139-04	93	Duplicate (R802139-01)	5.91	0.100			47	100			12	02/28/08	03/03 GRB-105

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

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 SPP-125 Gross Alpha and Gross Beta in Dissolved Solids,  
 rev 0

AVERAGES ± 2 SD MDA 7.22 ± 3.40  
 FOR 4 SAMPLES RESIDUE 54 ± 17

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 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

Test GAM Matrix SOLID  
 SDG 7776  
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN  
 GAMMA SPECTROSCOPY

Client Hanford  
 Contract No. 630  
 Contract SDG K1130

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 6148-022					
302139-01		7776-001	J169J5	2.05	0.092
302139-02		7776-002	Lab Control Sample	ok	ok
302139-03		7776-003	Method Blank	U	U
302139-04		7776-004	Duplicate (R802139-01)	ok	ok

Minimal values and limits from method RDLs (pCi/g) 0.050 0.100  
 MainSitesConfirmSamp- Other Solid

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 6148-022 2σ prep error 15.0 % Reference Lab Notebook #6148, pg. 22															
302139-01		J169J5	<u>14.3</u>	124					512			12	02/26/08	03/03	JR,05,00
302139-02		Lab Control Sample	<u>0.088</u>	124					512				02/26/08	03/03	JR,06,00
302139-03		Method Blank	<u>11.2</u>	124					512				02/26/08	03/03	JR,07,00
302139-04		Duplicate (R802139-01)	<u>10.7</u>	124					989			12	02/26/08	03/03	JR,01,00

Minimal values and limits from method 0.050 124 100 180

PROCEDURES REFERENCE GAMMA\_GS  
 SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD MDA 9.07 ± 12.4  
 FOR 4 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test C Matrix SOLID  
SDG 7776  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG K1130

RESULTS

LAB RAW SUP-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 6148-022

302139-01	7776-001	J169J5	U
302139-02	7776-002	Lab Control Sample	ok
302139-03	7776-003	Method Blank	U
302139-04	7776-004	Duplicate (R802139-01)	- U

Minimal values and limits from method RDLs (pCi/g) 50.0  
MainSitesConfirmSamp- Other Solid

METHOD PERFORMANCE

LAB	RAW	SUP-	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 6148-022			2σ prep error 10.0 % Reference Lab Notebook #6148, pg. 22										
302139-01		J169J5	2.96	0.478			100		50			26 03/15/08 03/17	LSC-004
302139-02		Lab Control Sample	3.34	0.400			100		50			03/15/08 03/17	LSC-004
302139-03		Method Blank	3.63	0.400			100		50			03/15/08 03/17	LSC-004
302139-04		Duplicate (R802139-01)	2.92	0.475			100		50			26 03/15/08 03/17	LSC-004

Minimal values and limits from method 50.0 0.400 10 180

PROCEDURES REFERENCE C14\_COX\_LSC  
CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD MDA 3.21 ± 0.673  
FOR 4 SAMPLES YIELD 100 ± 0

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METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 14

Lab id EBRLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1130

Test NI L Matrix SOLID  
 SDG 7776  
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG K1130

RESULTS

LB RAW SUF-  
 SMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 6148-022

02139-01	7776-001	J169J5	16.1
02139-02	7776-002	Lab Control Sample	ok
02139-03	7776-003	Method Blank	U
02139-04	7776-004	Duplicate (R802139-01)	ok

Minimal values and limits from method RDLs (pCi/g) 30.0

mainSitesConfirmSamp- Other Solid

METHOD PERFORMANCE

LB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-  
 SMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 6148-022 2σ prep error 10.0 % Reference Lab Notebook #6148, pg. 22

02139-01	J169J5	2.17	0.500	87	100	8	02/28/08	02/28	LSC-005
02139-02	Lab Control Sample	1.88	0.500	99	100		02/28/08	02/28	LSC-005
02139-03	Method Blank	1.88	0.500	100	100		02/28/08	02/28	LSC-005
02139-04	Duplicate (R802139-01)	2.21	0.500	85	100	8	02/28/08	02/28	LSC-005

Minimal values and limits from method 30.0 0.500 30-105 25 180

PROCEDURES REFERENCE NI63\_LSC  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 CP-280 Nickel-63 Purification, rev 3

AVERAGES ± 2 SD MDA 2.04 ± 0.359  
 FOR 4 SAMPLES YIELD 93 ± 16

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METHOD SUMMARIES

Page 5

SUMMARY DATA SECTION

Page 15

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K1130

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.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 16

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

R E P O R T G U I D E

Client Hanford  
 Contract No. 630  
 Case no SDG\_K1130

P R E P A R A T I O N B A T C H S U M M A R Y

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.

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 17

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

WORK SUMMARY

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

The following notes apply to this report:

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

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG\_K1130

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).

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 19

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
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GUIDE, cont.

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

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.

REPORT GUIDES

Page 5

SUMMARY DATA SECTION

Page 20

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. 630

Case no SDG\_K1130

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.

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 21

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG K1130

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.

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
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REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_K1130

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.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_K1130

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.

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 24

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG K1130

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

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
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GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG K1130

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.

REPORT GUIDES

Page 11

SUMMARY DATA SECTION

Page 26

Lab id EBRLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 630  
 Case no SDG K1130

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'

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 27

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. 630

Case no SDG\_K1130

METHOD SUMMARY

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

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

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 28

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776  
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
 Contract No. 630  
 Case no SDG\_K1130

METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

REPORT GUIDES

Page 14

SUMMARY DATA SECTION

Page 29

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 03/21/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1130

SDG 7776

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG\_K1130

GUIDE, cont.

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 30

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 03/21/08

**Washington Closure Hanford** Page 1 of 1  
**Collector** Welch-Koelling  
**Project Designation** Remaining Sites Confirmation Sampling - Other Solid  
**Ice Chest No.** AFS-04-033  
**Company Contact** Matt Perrott Telephone No. 372-9088  
**Sampling Location** K1130 (7776)  
**Field Logbook No.** EL-1601-2  
**Offsite Property No.** A080172  
**Project Coordinator** KESSNER, JH  
**Price Code** 9C  
**Data Turnaround** 15 Days  
**Method of Shipment** Fed Ex  
**Bill of Lading/Air Bill No.** see ospc

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	None	Cool 4C	Cool 4C	Cool 4C
J169J5	OTHER SOLID	2/20/05	0900		G/P	G/P	aG	aG	Cool 4C
J169J6	OTHER SOLID				G/P	G/P	aG	aG	Cool 4C
J169J7	OTHER SOLID				G/P	G/P	aG	aG	Cool 4C
J169J8	OTHER SOLID				G/P	G/P	aG	aG	Cool 4C
J169J9	OTHER SOLID				G/P	G/P	aG	aG	Cool 4C

**SAMPLE ANALYSIS**

See item (1) in Special Instructions.	See item (2) in Special Instructions.	Volume	No. of Container(s)	Type of Container
		500mL	1	G/P
		60mL	1	G/P
		250mL	1	G
		60mL	1	G

PCBs - 8082; Pesticides 8081; Chloro-Herbicides - EPA8151

Semi-VOA - 8270A (TCL) - TPH (Total) - 418.1

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	1445	Received By/Stored In	Date/Time
T. THORNTON	2/20/08		BHUDSON	2/20/08 1445
BHUDSON	2/20/08 1515		Received By/Stopped In	Date/Time
			1060 #3A	2/20/08 1515
			Received By/Stored In	Date/Time
			MLL	2/21/08 1130
			Received By/Stored In	Date/Time
			MLL	2/21/08 1500
			Received By/Stopped In	Date/Time
			MLL	2/21/08 1500
			Received By/Stored In	Date/Time
			MLL	2/21/08 10:00

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on-Assessment-244 Gross Alpha & Gross Beta; Nickel-63; Isotope-Potassium; Strontium-90; Total Sr; Technetium-99; Iodine-131; Uranium-232/234, Uranium-235; Chromium-236; Total Uranium - C-14 2/21/08

(2) ICP Metals - 6010A (SW-846) (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)

(3) ICP Metals + Hg, PCB, SVCA, TPH iC  
 sufficient material  
 samples from 3728 Ref # 3A  
 3728 Custodian removed samples for shipping on 2/21/08  
 Sampler unavailable to relinquish

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



# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 2/21/08 10:00 CoC No. RC-030-070

Container I.D. No. AFS-04-033 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 [ ] N/A [✓]
6. Number of samples in shipping container: 1 Sample Matrix OTHER SOLID
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 JR Date: 2/22/08 Time: 10:40

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J169J5	<60						

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. 100482 Calibration date 9 May 2007



21 March 2008



Joan Kessner  
WC-Hanford  
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 #	0802L644
SDG #	K1130
SAF #	RC-030
Date Received	2/22/08
# Samples	1
Matrix	OTHER SOLID
Volatiles	
Semivolatiles	X
Pest/PCB	X
Glycols	
DRO/KRO/GRO	
GC Alcohols	
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 Incorporated

Orlette S. Johnson  
Project Manager

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

Lionville Laboratory, Inc.  
 BNA ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-030 K1130



DATE RECEIVED: 02/22/08

LVL LOT # 0802L644

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J169J5	001	SO	08LE0107	02/20/08	02/28/08	03/16/08

LAB QC:

SBLKSZ	MB1	S	08LE0107	N/A	02/28/08	03/16/08
SBLKSZ	MB1 BS	S	08LE0107	N/A	02/28/08	03/15/08
SBLKSZ	MB1 BSD	S	08LE0107	N/A	02/28/08	03/16/08



## Case Narrative

**Client:** TNU-HANFORD RC-030  
**LVL #:** 0802L644  
**SDG/SAF #** K1130 / RC-030

**W.O. #:** 11343-606-001-9999-00  
**Date Received:** 02-22-2008

### SEMIVOLATILE

One (1) solid sample was collected on 02-22-2008.

The sample and its associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 02-20-2008 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for Client Specified Semivolatile target compounds on 03-15,16-2008.

All soil samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

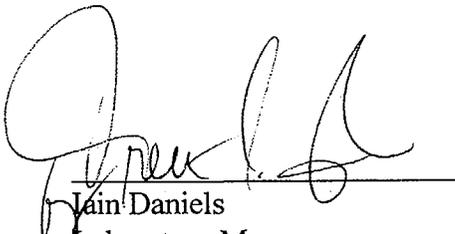
1. The results for solid samples were reported on an 'as-received basis'.
2. The sample was extracted and analyzed within holding time.
3. Non-target compounds were detected in these samples.
4. All surrogate recoveries were within acceptance criteria.
5. Twenty-eight (28) of one hundred and twenty-eight (128) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. The method blank was below the reporting limit for all target compounds.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. Internal standard area and retention time criteria were met.

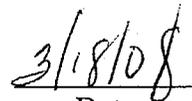
r:\group\data\2008\bna\mu\0802-644ksol1.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.



10. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
11. 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.
12. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

  
\_\_\_\_\_  
Jain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

  
\_\_\_\_\_  
Date



## GLOSSARY

### DATA QUALIFIERS

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

## GLOSSARY

### ABBREVIATIONS

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

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

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

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



Chemical Name	QTY	UNIT	MB1	BS	BSD
2-Chloronaphthalene	330	U	330	U	54
2-Nitroaniline	830	U	830	U	67
Dimethylphthalate	330	U	330	U	63
Acenaphthylene	330	U	330	U	57 *
2,6-Dinitrotoluene	330	U	330	U	64
3-Nitroaniline	830	U	830	U	64
Acenaphthene	330	U	330	U	58
2,4-Dinitrophenol	830	U	830	U	8 *
4-Nitrophenol	830	U	830	U	63
Dibenzofuran	330	U	330	U	64
2,4-Dinitrotoluene	330	U	330	U	71
Diethylphthalate	330	U	330	U	66
4-Chlorophenyl-phenylether	330	U	330	U	62
Fluorene	330	U	330	U	60
4-Nitroaniline	830	U	830	U	75
4,6-Dinitro-2-methylphenol	830	U	830	U	11 *
N-Nitrosodiphenylamine (1)	330	U	330	U	52
4-Bromophenyl-phenylether	330	U	330	U	56
Hexachlorobenzene	330	U	330	U	70
Pentachlorophenol	830	U	830	U	19 *
Phenanthrene	330	U	330	U	66
Anthracene	330	U	330	U	69
Carbazole	330	U	330	U	70
Di-n-butylphthalate	330	U	330	U	66
Fluoranthene	330	U	330	U	76
Pyrene	330	U	330	U	55
Butylbenzylphthalate	330	U	330	U	58
3,3'-Dichlorobenzidine	330	U	330	U	61
Benzo(a)anthracene	330	U	330	U	63
Chrysene	330	U	330	U	66
bis(2-Ethylhexyl)phthalate	23 JB	J	30	J	58
Di-n-octyl phthalate	330	U	330	U	55
Benzo(b)fluoranthene	330	U	330	U	65
Benzo(k)fluoranthene	330	U	330	U	62
Benzo(a)pyrene	330	U	330	U	65
Indeno(1,2,3-cd)pyrene	330	U	330	U	65
Dibenz(a,h)anthracene	330	U	330	U	64
Benzo(g,h,i)perylene	330	U	330	U	65

(1) - Cannot be separated from Diphenylamine. \* = Outside of EPA CLP QC limits.

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J169J5

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD RC-030 K1130

Matrix: (soil/water) SOLID

Lab Sample ID: 0802L644-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: N031510

Level: (low/med) LOW

Date Received: 02/22/08

% Moisture: 100 decanted: (Y/N) \_\_

Date Extracted: 02/28/08

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 03/16/08

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

Number TICs found: 5

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	5.314	600	JAB
2.	ALDOL CONDENSATE	5.436	1000	JAB
3.	UNKNOWN	5.994	100000	JB
4.	ALDOL CONDENSATE	7.144	400	JAB
5.	UNKNOWN	20.053	400	JB

1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKSZ

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD RC-030 K1130

Matrix: (soil/water) SOIL

Lab Sample ID: 08LE0107-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: N031508

Level: (low/med) LOW

Date Received: 02/28/08

% Moisture:        decanted: (Y/N)    

Date Extracted: 02/28/08

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 03/16/08

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH:       

CONCENTRATION UNITS:

Number TICs found: 5

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	ALDOL CONDENSATE	5.311	800	JA
2.	ALDOL CONDENSATE	5.433	2000	JA
3.	UNKNOWN	6.017	200000	J
4.	ALDOL CONDENSATE	7.158	800	JA
5.	UNKNOWN	20.058	500	J



**Washington Closure Hanford**  
 Collector: Welch-Koelling  
 Project Designation: Remaining Sites Confirmation Sampling - Other Solid  
 Ice Chest No.: **ERC-01-041**  
 Shipped To: **BERLINE SERVICES / LIONVILLE**  
 POSSIBLE SAMPLE HAZARDS/REMARKS: **NONE**  
 Special Handling and/or Storage: **Cool 4C**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 Project Coordinator: **KESSNER, JH**  
 Price Code: **9C**  
 Data Turnaround: **15 Days**

Company Contact: **Matt Perrott** (372-9088)  
 Telephone No.: **372-9088**  
 Sampling Location: **100-F-57-51**  
 Field Logbook No.: **EL-1601-2**  
 Offsite Property No.: **A080188**  
 Method of Shipment: **Fed Ex**  
 Bill of Lading/Air Bill No.: **see aspc**

Sample No.	Matrix *	Date/Time	Sample Date	Sample Time	Sign/Print Names	Date/Time
J169J5	OTHER SOLID	2/20/08	2/20/05	0900	<b>BHUDSON</b>	2/20/08 1415
J169J6	OTHER SOLID	2/20/08				
J169J7	OTHER SOLID	2/20/08 1515				
J169J8	OTHER SOLID	2/21/08 1100				
J169J9	OTHER SOLID	2/22/08 1330				

Sample No.	Matrix *	Date/Time	Sample Date	Sample Time	Sign/Print Names	Date/Time
J169J5	OTHER SOLID	2/20/08	2/20/05	0900	<b>BHUDSON</b>	2/20/08 1415
J169J6	OTHER SOLID	2/20/08				
J169J7	OTHER SOLID	2/20/08 1515				
J169J8	OTHER SOLID	2/21/08 1100				
J169J9	OTHER SOLID	2/22/08 1330				

Sample No.	Matrix *	Date/Time	Sample Date	Sample Time	Sign/Print Names	Date/Time
J169J5	OTHER SOLID	2/20/08	2/20/05	0900	<b>BHUDSON</b>	2/20/08 1415
J169J6	OTHER SOLID	2/20/08				
J169J7	OTHER SOLID	2/20/08 1515				
J169J8	OTHER SOLID	2/21/08 1100				
J169J9	OTHER SOLID	2/22/08 1330				

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL [Is]) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add on (Americium-241, Americium-244, Gross Alpha & Gross Beta; Nickel-63; Isotope-Hydrogen; Strontium-90) - Total Str. Spectrometry - (Strontium-90, Strontium-89, Strontium-87, Strontium-86, Strontium-84, Strontium-82, Strontium-81, Strontium-80, Strontium-79, Strontium-78, Strontium-76, Strontium-74, Strontium-72, Strontium-70, Strontium-68, Strontium-66, Strontium-64, Strontium-62, Strontium-60, Strontium-58, Strontium-56, Strontium-54, Strontium-52, Strontium-50, Strontium-48, Strontium-46, Strontium-44, Strontium-42, Strontium-40, Strontium-38, Strontium-36, Strontium-34, Strontium-32, Strontium-30, Strontium-28, Strontium-26, Strontium-24, Strontium-22, Strontium-20, Strontium-18, Strontium-16, Strontium-14, Strontium-12, Strontium-10, Strontium-8, Strontium-6, Strontium-4, Strontium-2, Strontium-0)

(2) ICP Metals - 6010A (SW-846) (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)

(3) ICP Metals + Hs, PCB, SVCA, TPH iC  
 sufficient material

1060 samples from 9728 Ref # 3A  
 3728 Custodian removed samples for shipping on 2/21/08  
 Sampler unavailable to relinquish

**LABORATORY SECTION**  
 Received By: \_\_\_\_\_ Title: \_\_\_\_\_  
 Disposal Method: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**FINAL SAMPLE DISPOSITION**  
 Received By: \_\_\_\_\_ Title: \_\_\_\_\_  
 Disposal Method: \_\_\_\_\_ Date/Time: \_\_\_\_\_

WCH-EE-011

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

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

Date: 2.22.08

LvLI Batch #: 0802L644

Sample Custodian: D. Yonish

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |   |            |
|---|---|---|------------|
| 1. Samples Hand Delivered or <u>Shipped</u>   | Carrier <u>FedEx</u>  | Airbill # <u>7988 7976 2056</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 °C</u>  | Cooler # <u>ERC-01-041</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 type="checkbox"/> Yes <input type="checkbox"/> No<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |   |            |
| 10. All sample label information matches COC?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   |   |            |
| 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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | <input 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   | Date _____ |



Lionville Laboratory, Inc.  
 PCB ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-030 K1130



DATE RECEIVED: 02/22/08

LVL LOT # : 080210644

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J169J5	001	SO	08LE0106	02/20/08	02/27/08	03/03/08
J169J5	001 MS	SO	08LE0106	02/20/08	02/27/08	03/03/08
J169J5	001 MSD	SO	08LE0106	02/20/08	02/27/08	03/03/08
LAB QC:						
PBLKNJ	MB1	S	08LE0106	N/A	02/27/08	02/29/08
PBLKNJ	MB1 BS	S	08LE0106	N/A	02/27/08	02/29/08



Case Narrative

**Client:** TNU-HANFORD RC-030  
**LVL #:** 0802L644  
**SDG/SAF #** K1130 / RC-030

**W.O. #:** 11343-606-001-9999-00  
**Date Received:** 02-22-2008

**PCB**

One (1) solid sample was collected on 02-20-2008.

The sample and its associated QC samples were extracted on 02-27-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 02-29-2007 and 03-03-2008. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

All solid samples are reported on a dry weight basis unless requested by the client, required by the method, or noted otherwise. The following is a summary of the QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

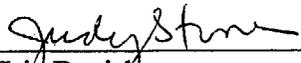
1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

k:\group\data\pest\tnu\0802-644ksol1.pcb.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.



10. 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.
  
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this 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

3/7/08  
Date



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

Lionville Laboratory, Inc.  
 Report Date: 03/04/08 12:37  
 PCBs by GC  
 Client: TNUHANFORD RC-030 K1130 Work Order: 11343606001 Page: 1  
 RFW Batch Number: 0802L644

Cust ID:	J169J5	J169J5	J169J5	J169J5	PBLKNJ	PBLKNJ BS
RFW#:	001	001 MS	001 MSD	08LE0106-MB1	08LE0106-MB1	08LE0106-MB1
Matrix:	SOLID	SOLID	SOLID	SOIL	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:	101	%	100	%	106	%	96	%	112	%
Tetrachloro-m-xylene	200	U	89	%	94	%	13	U	99	%
Decachlorobiphenyl	200	U	200	U	200	U	13	U	13	U
Aroclor-1016	200	U	200	U	200	U	13	U	13	U
Aroclor-1221	200	U	200	U	200	U	13	U	13	U
Aroclor-1232	200	U	200	U	200	U	13	U	13	U
Aroclor-1242	200	U	200	U	200	U	13	U	13	U
Aroclor-1248	200	U	200	U	200	U	13	U	13	U
Aroclor-1254	200	U	200	U	200	U	13	U	13	U
Aroclor-1260	200	U	90	%	95	%	13	U	99	%

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

SAMPLE EXTRACTION RECORD

Sheet no.: 1

9000000000

Extract. Date: 02/27/08      Extraction Batch No: 08LE0106      Analyst: MF      Method: \*\*\*\*  
 Test: OPCB      Cleanup Date: 02/29/08      Analyst: MF      Client: TNUHANFORD RC-030 K1125  
 LIMS Report Date: 03/05/08      Solvent: DCM/ACETONE,HEXANE      Adsorbent: H2SO4

Sample No:	Client Name Client ID	pH	Initial Surr. WT/VOL	Spike Final Mult. VOL	Final Split VOL	% Mult.	Y/N Solids	C/D FACTOR
0802L635-	TNUHANFORD RC-030 K1125							
001	J16994	2.0	1.0	10	1.0	N	0.00	5000.0
001 -S	J16994	2.0	1.0	10	1.0	N	0.00	5000.0
001 -T	J16994	2.0	1.0	10	1.0	N	0.00	5000.0
0802L644-	TNUHANFORD RC-030 K1130							
001	J169J5	2.0	1.0	10	1.0	N	0.00	5000.0
001 -S	J169J5	2.0	1.0	10	1.0	N	0.00	5000.0
001 -T	J169J5	2.0	1.0	10	1.0	N	0.00	5000.0
0802L645-	TNUHANFORD RC-030 K1129							
001	J16222-A	2.0	1.0	10	1.0	N	0.00	5000.0
001 -S	J16222-A	2.0	1.0	10	1.0	N	0.00	5000.0
001 -T	J16222-A	2.0	1.0	10	1.0	N	0.00	5000.0
0802L646-	VISTA ENGINEERING							
001	B020	30.0	1.0	10	1.0	N	96.64	344.9
001 -S	B020	30.0	1.0	10	1.0	N	96.64	344.9
001 -T	B020	30.0	1.0	10	1.0	N	96.64	344.9
002	B021	30.0	1.0	10	1.0	N	97.78	340.9
003	B022	30.0	1.0	10	1.0	N	94.11	354.2
004	B023	30.0	1.0	10	1.0	N	97.63	341.4
005	B024	30.0	1.0	10	1.0	N	97.80	340.8
006	B025	30.0	1.0	10	1.0	N	96.85	344.2
007	B026	30.0	1.0	10	1.0	N	97.43	342.1
08LE0106-MB1	PBLKNJ	30.0	1.0	10	1.0	N	100.00	333.3
08LE0106-MB1 -S	PBLKNJ	30.0	1.0	10	1.0	N	100.00	333.3

Comments:  
 Surrogate: 250 UL OLM PSURR 89916404  
 Spike: 250 UL ARI660 89916602

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
			LC	3-5-08	Revision





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

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

Date: 2-22-08

LvLI Batch #: 0802L644

Sample Custodian: D. Smith

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |   |
|---|---|---|
| 1. Samples Hand Delivered or <u>Shipped</u>   | Carrier <u>FedEx</u>  | Airbill # <u>7988 7976 2056</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 °C</u>  | Cooler # <u>ERC-01-041</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?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         |   |
| All samples received on COC?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         |   |
| 10. All sample label information matches COC?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         |   |
| 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?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         | <input checked="" type="checkbox"/> N/A   |
| Short holds taken to wet lab?   | <input type="checkbox"/> Yes <input type="checkbox"/> No                    |   |
| 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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No         | <input 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?   | <input type="checkbox"/> Yes <input type="checkbox"/> No                    | <input checked="" type="checkbox"/> N/A   |
| Person Contacted _____  | Date _____  |   |



Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD, RC-030 K1130



DATE RECEIVED: 02/22/08

LVL LOT # :0802L644

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J169J5						
SILVER, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
SILVER, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
SILVER, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
ALUMINUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
ALUMINUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
ALUMINUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
ARSENIC, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
ARSENIC, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
ARSENIC, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
BORON, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
BORON, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
BORON, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
BARIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
BARIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
BARIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
BERYLLIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
BERYLLIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
BERYLLIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
CALCIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
CALCIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
CALCIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
CADMIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
CADMIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
CADMIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
COBALT, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
COBALT, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
COBALT, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
CHROMIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
CHROMIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
CHROMIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
COPPER, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
COPPER, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
COPPER, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
IRON, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
IRON, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-030 K1130

DATE RECEIVED: 02/22/08

LVL LOT # :0802L644

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
MERCURY, TOTAL	001	SO	08C0039	02/20/08	02/27/08	02/28/08
MERCURY, TOTAL	001 REP	SO	08C0039	02/20/08	02/27/08	02/28/08
MERCURY, TOTAL	001 MS	SO	08C0039	02/20/08	02/27/08	02/28/08
POTASSIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
POTASSIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
POTASSIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
MAGNESIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
MAGNESIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
MAGNESIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
MANGANESE, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
MANGANESE, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
MANGANESE, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
MOLYBDENUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
MOLYBDENUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
MOLYBDENUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
SODIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
SODIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
SODIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
NICKEL, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
NICKEL, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
NICKEL, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
LEAD, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
LEAD, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
LEAD, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
ANTIMONY, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
ANTIMONY, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
ANTIMONY, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
SELENIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
SELENIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
SELENIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
SILICON, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
SILICON, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
SILICON, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
VANADIUM, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08
VANADIUM, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
VANADIUM, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08
ZINC, TOTAL	001	SO	08L0089	02/20/08	02/29/08	03/04/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-030 K1130

DATE RECEIVED: 02/22/08

LVL LOT # :0802L644

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ZINC, TOTAL	001 REP	SO	08L0089	02/20/08	02/29/08	03/04/08
ZINC, TOTAL	001 MS	SO	08L0089	02/20/08	02/29/08	03/04/08

LAB QC:

SILVER LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
SILVER, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
ALUMINUM LABORTORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
ALUMINUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
ARSENIC LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
ARSENIC, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
BORON LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
BORON, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
BARIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
BARIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
BERYLLIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
BERYLLIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
CALCIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
CALCIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
CADMIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
CADMIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
COBALT LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
COBALT, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
CHROMIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
CHROMIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
COPPER LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
COPPER, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
IRON LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
IRON, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
MERCURY LABORATORY	LC1 BS	S	08C0039	N/A	02/27/08	02/28/08
MERCURY, TOTAL	MB1	S	08C0039	N/A	02/27/08	02/28/08
POTASSIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
POTASSIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
MAGNESIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
MAGNESIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
MANGANESE LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
MANGANESE, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
MOLYBDENUM LABORATOR	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD RC-030 K1130

DATE RECEIVED: 02/22/08

LVL LOT # :0802L644

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MOLYBDENUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
SODIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
SODIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
NICKEL LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
NICKEL, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
LEAD LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
LEAD, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
ANTIMONY LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
ANTIMONY, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
SELENIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
SELENIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
SILICON LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
SILICON, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
VANADIUM LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
VANADIUM, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08
ZINC LABORATORY	LC1 BS	S	08L0089	N/A	02/29/08	03/03/08
ZINC, TOTAL	MB1	S	08L0089	N/A	02/29/08	03/03/08



## Analytical Report

Client: TNU-HANFORD RC-030  
LVL#: 0802L644<sub>D</sub>  
SDG/SAF#: KV<sup>3</sup>/RC-030

W.O.#: 11343-606-001-9999-00  
Date Received: 02-22-08

### 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 analysis of 1 soil sample.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

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

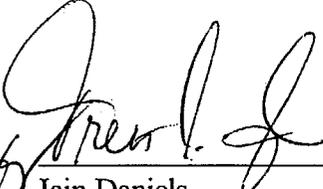
3. All analyses were performed within the required holding times.
4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), 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 results were reported herein "uncorrected" for the levels found in the MB.
7. All ICP Interference Check Standards were within control limits.

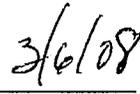
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 17 pages.

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 8.1%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.
9. The 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 serial dilution is performed for Mercury. 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>
J169J5	Cadmium	300	102.5
	Copper	300	92.5
	Iron	66,000	93.0
	Manganese	300	64.5
	Zinc	6,000	75.0
	Silicon	6,300	97.2
	Antimony	300	100.4

11. The duplicate analyses for 3 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  


  
 Date

# METALS METHOD GLOSSARY

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

Lot#: 0802 L644

Leaching Procedure: 1310 1311 1312 Other: \_\_\_\_\_

CLP 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<sup>s</sup></u>	<u>200.7</u> <u>204.2</u>			<u>99</u>
Arsenic	<input checked="" type="checkbox"/> 6010B <u>7060A<sup>s</sup></u>	<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>99</u>
Bismuth	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7<sup>1</sup></u>		<u>1620</u>	<u>99</u>
Boron	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Cadmium	<input checked="" type="checkbox"/> 6010B <u>7131A<sup>s</sup></u>	<u>200.7</u> <u>213.2</u>			<u>99</u>
Calcium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Chromium	<input checked="" type="checkbox"/> 6010B <u>7191<sup>s</sup></u>	<u>200.7</u> <u>218.2</u>			<u>SS17</u>
Cobalt	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Copper	<input checked="" type="checkbox"/> 6010B <u>7211<sup>s</sup></u>	<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<sup>s</sup></u>	<u>200.7</u> <u>239.2</u>	<u>3113B</u>		<u>99</u>
Lithium	<input checked="" type="checkbox"/> 6010B <u>7430<sup>4</sup></u>	<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	<u>7470A<sup>s</sup></u> <input checked="" type="checkbox"/> <u>7471A<sup>s</sup></u>	<u>245.1<sup>2</sup></u> <u>245.5<sup>2</sup></u>			<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<sup>4</sup></u>	<u>200.7</u> <u>258.1<sup>4</sup></u>			<u>99</u>
Rare Earths	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7<sup>1</sup></u>		<u>1620</u>	<u>99</u>
Selenium	<input checked="" type="checkbox"/> 6010B <u>7740<sup>s</sup></u>	<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<sup>s</sup></u>	<u>200.7</u> <u>272.2</u>			<u>99</u>
Sodium	<input checked="" type="checkbox"/> 6010B <u>7770<sup>4</sup></u>	<u>200.7</u> <u>273.1<sup>4</sup></u>			<u>99</u>
Strontium	<input checked="" type="checkbox"/> 6010B	<u>200.7</u>			<u>99</u>
Thallium	<input checked="" type="checkbox"/> 6010B <u>7841<sup>s</sup></u>	<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>99</u>
Uranium	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7<sup>1</sup></u>		<u>1620</u>	<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>99</u>
Zirconium	<input checked="" type="checkbox"/> 6010B <sup>1</sup>	<u>200.7<sup>1</sup></u>		<u>1620</u>	<u>99</u>

Other: \_\_\_\_\_

Method: \_\_\_\_\_

# 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 03/06/08

CLIENT: TNUHANFORD RC-030 K1130  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0802L644

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J169J5	Silver, Total	0.29	u MG/KG	0.29	3.0
		Aluminum, Total	5560	MG/KG	11.5	3.0
		Arsenic, Total	13.4	MG/KG	1.4	3.0
		Boron, Total	3.7	MG/KG	1.4	3.0
		Barium, Total	185	MG/KG	0.29	3.0
		Beryllium, Total	0.65	MG/KG	0.14	3.0
		Calcium, Total	4050	MG/KG	11.5	3.0
		Cadmium, Total	20.0	MG/KG	0.14	3.0
		Cobalt, Total	17.7	MG/KG	0.58	3.0
		Chromium, Total	45.3	MG/KG	0.58	3.0
		Copper, Total	152	MG/KG	0.58	3.0
		Iron, Total	85600	MG/KG	13.0	3.0
		Mercury, Total	0.95	MG/KG	0.009	1.0
		Potassium, Total	828	MG/KG	11.5	3.0
		Magnesium, Total	3480	MG/KG	7.2	3.0
		Manganese, Total	5710	MG/KG	0.12	3.0
		Molybdenum, Total	4.9	MG/KG	0.86	3.0
		Sodium, Total	200	MG/KG	5.8	3.0
		Nickel, Total	65.6	MG/KG	0.58	3.0
		Lead, Total	80.4	MG/KG	0.86	3.0
		Antimony, Total	1.5	MG/KG	0.86	3.0
		Selenium, Total	1.7	u MG/KG	1.7	3.0
		Silicon, Total	299	MG/KG	11.5	3.0
		Vanadium, Total	41.5	MG/KG	0.40	3.0
		Zinc, Total	1340	MG/KG	1.7	3.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/06/08

CLIENT: TNUHANFORD RC-030 K1130  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0802L644

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0089-MB1	Silver, Total	0.10	u 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	0.10	u MG/KG	0.10	1.0
		Beryllium, Total	0.05	u MG/KG	0.05	1.0
		Calcium, Total	13.7	MG/KG	4.0	1.0
		Cadmium, Total	0.05	u MG/KG	0.05	1.0
		Cobalt, Total	0.20	u MG/KG	0.20	1.0
		Chromium, Total	0.20	u MG/KG	0.20	1.0
		Copper, Total	0.20	u MG/KG	0.20	1.0
		Iron, Total	4.5	u MG/KG	4.5	1.0
		Potassium, Total	4.0	u MG/KG	4.0	1.0
		Magnesium, Total	2.5	u MG/KG	2.5	1.0
		Manganese, Total	0.10	MG/KG	0.04	1.0
		Molybdenum, Total	0.30	u MG/KG	0.30	1.0
		Sodium, Total	10.4	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	08C0039-MB1	Mercury, Total	0.01	u MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/06/08

CLIENT: TNUHANFORD RC-030 K1130  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0802L644

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J169J5	Silver, Total	4.2	0.29u	4.7	89.4	3.0
		Aluminum, Total	5730	5560	189	87.3*	3.0
		Arsenic, Total	201	13.4	189	99.5	3.0
		Boron, Total	93.0	3.7	94.3	94.7	3.0
		Barium, Total	347	185	189	85.8	3.0
		Beryllium, Total	5.3	0.65	4.7	99.0	3.0
		Calcium, Total	6460	4050	2360	102.3	3.0
		Cadmium, Total	22.2	20.0	4.7	46.8*	3.0
		Cobalt, Total	63.3	17.7	47.1	96.8	3.0
		Chromium, Total	59.7	45.3	18.9	76.2	3.0
		Copper, Total	156	152	23.6	18.2*	3.0
		Iron, Total	96800	85600	94.3	11820 *	3.0
		Mercury, Total	1.9	0.95	0.46	203.3	3.0
		Potassium, Total	3060	828	2360	94.5	3.0
		Magnesium, Total	5600	3480	2360	89.7	3.0
		Manganese, Total	5250	5710	47.1	-980. *	3.0
		Molybdenum, Total	91.5	4.9	94.3	91.8	3.0
		Sodium, Total	2360	200	2360	91.5	3.0
		Nickel, Total	108	65.6	47.1	89.2	3.0
		Lead, Total	116	80.4	47.1	76.2	3.0
		Antimony, Total	24.4	1.5	47.1	48.6	3.0
		Selenium, Total	164	1.7 u	189	86.7	3.0
		Silicon, Total	440	299	94.3	149.5	3.0
		Vanadium, Total	82.4	41.5	47.1	86.8	3.0
		Zinc, Total	1250	1340	47.1	-200. *	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/06/08

CLIENT: TNUHANFORD RC-030 K1130  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0802L644

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	J169J5	Silver, Total	0.29u	0.28u	NC	3.0
		Aluminum, Total	5560	4890	12.9	3.0
		Arsenic, Total	13.4	12.7	5.4	3.0
		Boron, Total	3.7	2.5	38.7	3.0
		Barium, Total	185	160	14.8	3.0
		Beryllium, Total	0.65	0.57	13.0	3.0
		Calcium, Total	4050	4170	2.8	3.0
		Cadmium, Total	20.0	18.6	7.3	3.0
		Cobalt, Total	17.7	16.7	5.8	3.0
		Chromium, Total	45.3	38.4	16.5	3.0
		Copper, Total	152	148	2.6	3.0
		Iron, Total	85600	85700	0.11	3.0
		Mercury, Total	0.95	0.86	10.2	1.0
		Potassium, Total	828	761	8.4	3.0
		Magnesium, Total	3480	3340	4.1	3.0
		Manganese, Total	5710	5470	4.3	3.0
		Molybdenum, Total	4.9	4.0	20.2	3.0
		Sodium, Total	200	161	21.9	3.0
		Nickel, Total	65.6	57.1	13.9	3.0
		Lead, Total	80.4	91.5	12.9	3.0
		Antimony, Total	1.5	0.83u	NC	3.0
		Selenium, Total	1.7 u	1.7 u	NC	3.0
		Silicon, Total	299	349	15.4	3.0
		Vanadium, Total	41.5	37.4	10.4	3.0
		Zinc, Total	1340	1320	1.1	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/06/08

CLIENT: TNUHANFORD RC-030 K1130  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0802L644

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	08L0089-LC1	Silver, LCS	46.6	50.0	MG/KG	93.2
		Aluminum, LCS	492	500	MG/KG	98.4
		Arsenic, LCS	911	1000	MG/KG	91.1
		Boron, LCS	458	500	MG/KG	91.6
		Barium, LCS	476	500	MG/KG	95.3
		Beryllium, LCS	23.5	25.0	MG/KG	94.0
		Calcium, LCS	2350	2500	MG/KG	94.0
		Cadmium, LCS	22.9	25.0	MG/KG	91.6
		Cobalt, LCS	233	250	MG/KG	93.1
		Chromium, LCS	46.9	50.0	MG/KG	93.8
		Copper, LCS	122	125	MG/KG	97.3
		Iron, LCS	469	500	MG/KG	93.8
		Potassium, LCS	2310	2500	MG/KG	92.5
		Magnesium, LCS	2300	2500	MG/KG	91.9
		Manganese, LCS	72.2	75.0	MG/KG	96.3
		Molybdenum, LCS	451	500	MG/KG	90.1
		Sodium, LCS	2220	2500	MG/KG	88.8
		Nickel, LCS	185	200	MG/KG	92.7
		Lead, LCS	234	250	MG/KG	93.7
		Antimony, LCS	280	300	MG/KG	93.2
		Selenium, LCS	905	1000	MG/KG	90.5
		Silicon, LCS	40.4	500	MG/KG	8.1
		Vanadium, LCS	235	250	MG/KG	93.9
		Zinc, LCS	92.6	100	MG/KG	92.6
LCS1	08C0039-LC1	Mercury, LCS	4.8	2.8	MG/KG	<del>170.2</del> 101.2

*corrected value  
 on 3/6/08*

SAMPLE DIGESTION RECORD

Digestion Batch #: 08L0089  
 Date/Time Initiated: 2/29/08 1130  
 Date/Time Completed: 2/29/08 1800  
 Analyst(s): AW  
 Matrix: Soil Water Other: \_\_\_\_\_  
 Instr. Type: AA CP  
 Parameters: See backlog

SOP: L-SPI-3020 Rev. 00  
 Method: SW 3005A DW 200.7 (1994)  
 (circle) 3010A 200.9  
 3015 3113B  
 3020A  
 7060A (As/Se) MCAWW 200.7 (1982)  
 7760A (Ag) 200 (AA)  
 206.2 (As/Se)  
3050B  
 3051 SM 3030C (NC)  
 CLP ILMO3.0 Other Typha  
 ILMO4.0

Digested / Undigested (circle one)  
 Balance #: B20  
 Balance Cal Verif: 91 NA  
 Hot Plate Temp: 91

TNU

COC Batch #	Spike Vol(s) (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH	Type: To/Sol/TC	Texture	Color/Appearance	Artifact	Turb
08022629-001		1.16 gm	100 mL		TD	coarse	tan / granular	(C track some)	
002		1.11 gm				fine	dark / rocks	rocks	
002R		1.18 gm							
002S	1.0 mL	1.11 gm							
003		1.13 gm							
004		1.06 gm						none	
08022630-001		1.06 gm					tan		
001R		1.08 gm							
001S	1.0 mL	1.06 gm							
002		1.09 gm							
003		1.12 gm							
08022635-001		1.04 gm				coarse	dk. brown / chunks of root (?)		
001R		1.05 gm							
001S	1.0 mL	1.03 gm							
08022644-001		1.04 gm				fine			
001R		1.08 gm							
001S	1.0 mL	1.06 gm							
08L0089-MBI		1.0 gm							
LC1		1.0 gm							

TNU 2/29/08

Spiking IDs:  
 MS #: 8100-04-01  
 \_\_\_\_\_ 02  
 \_\_\_\_\_ 03  
8072-072-01  
 LCS #: \_\_\_\_\_ 02  
 \_\_\_\_\_ 03  
 \_\_\_\_\_ 04  
 \_\_\_\_\_ 05

Reagent IDs:  
 HNO3 \_\_\_\_\_  
 HCL \_\_\_\_\_  
 H2O2 \_\_\_\_\_  
 1:1 HNO3 9789-070-06  
 1:1 HCL \_\_\_\_\_

File ID#: TC008901  
 LIMS Transfer: Ⓞ N  
 Data Review By/Date: PMP, 02/29/08  
Updated



**Washington Closure Hanford**      **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**      Page 1 of 1

Collector: **Welch-Koelling**      Telephone No. **372-9088**      RC-030-070      Price Code **9C**      Data Turnaround **15 Days**

Project Designation: **Remainig Sites Confirmation Sampling - Other Solid**      Project Coordinator: **KESSNER, JH**

SAF No. **RC-030**

Method of Shipment: **Fed Ex**

Bill of Lading/Air Bill No. **sec aspc**

COA **COOFSIA000**      Method of Shipment: **Fed Ex**

Field Logbook No. **EL-1601-2**      Offsite Property No. **A080188**

COA **COOFSIA000**      Method of Shipment: **Fed Ex**

Field Logbook No. **EL-1601-2**      Offsite Property No. **A080188**

**SHIPPED TO**  
EBERLINE SERVICES / LIONVILLE  
POSSIBLE SAMPLE HAZARDOUS REMARKS  
**NONC**

**SPECIAL HANDLING AND/OR STORAGE:**  
**COOL 4°C**

Sample No.	Matrix *	Date/Time	Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Signature/Print Names	Sample Date	Sample Time	Preservation	Note	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Matrix *
J169J5	OTHER SOLID	2/20/08	1445	2/20/08	1445	BHUDSON	BHUDSON	0900		None	G/P	60mL	aG	aG	aG	250mL	S=Soil SE=Soil SO=Solid SW=Sludge W=Water O=Oil A=Air DS=Drum Solid DL=Drum Liquid T=Truck W=Wipe L=Liquid V=Vegetium X=Other
J169J6	OTHER SOLID	2/20/08	1445	2/20/08	1515	1000 #3A	1000 #3A			PCBs - 8082; Pesticides 8081; Chloro- Herbicides - EPA 8151	G/P	60mL	aG	aG	aG	250mL	
J169J7	OTHER SOLID	2/20/08	1445	2/20/08	1515	1000 #3A	1000 #3A			PCBs - 8082; Pesticides 8081; Chloro- Herbicides - EPA 8151	G/P	60mL	aG	aG	aG	250mL	
J169J8	OTHER SOLID	2/20/08	1445	2/20/08	1515	1000 #3A	1000 #3A			PCBs - 8082; Pesticides 8081; Chloro- Herbicides - EPA 8151	G/P	60mL	aG	aG	aG	250mL	
J169J9	OTHER SOLID	2/20/08	1445	2/20/08	1515	1000 #3A	1000 #3A			PCBs - 8082; Pesticides 8081; Chloro- Herbicides - EPA 8151	G/P	60mL	aG	aG	aG	250mL	

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241), Americium-241, Americium-241 & Gross Beta; Nickel-63; Isotope Plutonium-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-2278-2279-2280-2281-2282-2283-2284-2285-2286-2287-2288-2289-2290-2291-2292-2293-2294-2295-2296-2297-2298-2299-2300-2301-2302-2303-2304-2305-2306-2307-2308-2309-2310-2311-2312-2313-2314-2315-2316-2317-2318-2319-2320-2321-2322-2323-2324-2325-2326-2327-2328-2329-2330-2331-2332-2333-2334-2335-2336-2337-2338-2339-2340-2341-2342-2343-2344-2345-2346-2347-2348-2349-2350-2351-2352-2353-2354-2355-2356-2357-2358-2359-2360-2361-2362-2363-2364-2365-2366-2367-2368-2369-2370-2371-2372-2373-2374-2375-2376-2377-2378-2379-2380-2381-2382-2383-2384-2385-2386-2387-2388-2389-2390-2391-2392-2393-2394-2395-2396-2397-2398-2399-2400-2401-2402-2403-2404-2405-2406-2407-2408-2409-2410-2411-2412-2413-2414-2415-2416-2417-2418-2419-2420-2421-2422-2423-2424-2425-2426-2427-2428-2429-2430-2431-2432-2433-2434-2435-2436-2437-2438-2439-2440-2441-2442-2443-2444-2445-2446-2447-2448-2449-2450-2451-2452-2453-2454-2455-2456-2457-2458-2459-2460-2461-2462-2463-2464-2465-2466-2467-2468-246

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

CLIENT: TNU Hartford  
 Project/SAF/SOW/Release #: RC-030

Date: 2-22-08

LvLI Batch #: 0802L644

Sample Custodian: D. Yonick

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or <u>Shipped</u>	Carrier: <u>FedEx</u>	Airbill # <u>7988 7976 2056</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 °C</u>	Cooler # <u>ERC-01-041</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? All samples received on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
10. All sample label information matches COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
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? Short holds taken to wet lab?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<del>N/A</del>
13. VOA, TOC, TOX free of headspace?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<del>N/A</del>
14. QC stickers placed on bottles designated by client?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input 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? Person Contacted _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	<del>N/A</del>
	Date _____	

