

**SAF-RC-007**  
**100-N Ancillary Facilities & 190-DR ETF**  
**Analytical Data Requirements - Liquid**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Amy Hood	X0-18	<u>KW 6/10/08</u> INITIAL/DATE
Tom Edmundson	X0-18	<u>KW 6/10/08</u> INITIAL/DATE

**COMMENTS:**

**SDG K1194**

**SAF-RC-007**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 182-N Basement Sump**

**RECEIVED**  
JUN 12 2008  
EDMC



# EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION  
2030 Wright Avenue  
Richmond, California 94804-3849  
Phone (510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
www.eberlineservices.com

May 7, 2008

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

Reference: **P.O. #S00W235A00**  
**Eberline Services R8-04-145-7805, SDG K1194**



Dear Ms. Kessner:

Enclosed is the data report for one water sample designated under SAF No. RC-007, received at Eberline Services on April 25, 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

**1.0 GENERAL**

Washington Closure Hanford (WCH) Sample Delivery Group K1194 was composed of one water sample designated under SAF No. RC-007 with a Project Designation of: 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re.

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 May 7, 2008.

**2.0 ANALYSIS NOTES**

**2.1 Gross Alpha and Gross Beta Analysis**

No problems were encountered during the course of the analyses.

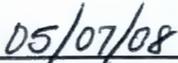
**2.2 Gamma Spectroscopy**

No problems were encountered during the course of the analyses.

**3.0 Case Narrative Certification Statement**

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

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

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP K1194

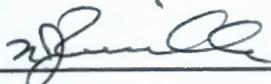
SDG 7805  
Contact Melissa C. Mannion

Client Hanford  
Contract No. S00W235A00  
Case no SDG\_K1194

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

T A B L E   O F   C O N T E N T S

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Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 05/07/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1194

SDG 7805

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. S00W235A00

Case no SDG K1194

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 05/07/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1194

SDG 7805  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. S00W235A00  
Case no SDG K1194

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

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SUMMARY DATA SECTION

Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

SDG 7805  
 Contact Melissa C. Mannion

**LAB SAMPLE SUMMARY**

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1194

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R804145-01	J16MM2	182-N Basemenr Sump	WATER		RC-007	RC-007-025	04/21/08 10:35
R804145-02	Lab Control Sample		WATER		RC-007		
R804145-03	Method Blank		WATER		RC-007		
R804145-04	Duplicate (R804145-01)	182-N Basemenr Sump	WATER		RC-007		04/21/08 10:35

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

SDG 7805  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1194

C BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	DEPARTMENT SAMPLE ID
805	RC-007-025	J16MM2	WATER		1.0 L		04/25/08 4	R804145-01	7805-001
		Method Blank	WATER					R804145-03	7805-003
		Lab Control Sample	WATER					R804145-02	7805-002
		Duplicate (R804145-01)	WATER		1.0 L		04/25/08 4	R804145-04	7805-004

QC SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

SDG 7805  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1194

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
<b>Gas Proportional Counting</b>										
93A	WATER	Gross Alpha in Water	6148-098	20.6	1			1	1	1/1
93B	WATER	Gross Beta in Water	6148-098	11.0	1			1	1	1/1
<b>Gamma Spectroscopy</b>										
GAM	WATER	Gamma Emitters	6148-098	7.0	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.

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

SDG 7805

Contact Melissa C. Mannion

**LAB WORK SUMMARY**

Client Hanford

Contract No. S00W235A00

Case no SDG K1194

AB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION	MATRIX			SUF-					
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
804145-01	J16MM2		7805-001	93A/93		05/03/08	05/05/08	BW	Gross Alpha in Water	
04/21/08	182-N Basemenr Sump		7805-001	93B/93		05/03/08	05/05/08	BW	Gross Beta in Water	
04/25/08	RC-007-025	RC-007	7805-001	GAM		04/29/08	05/01/08	CSS	Gamma Emitters	
804145-02	Lab Control Sample		7805-002	93A/93		05/03/08	05/05/08	BW	Gross Alpha in Water	
			7805-002	93B/93		05/03/08	05/05/08	BW	Gross Beta in Water	
		RC-007	7805-002	GAM		04/30/08	05/01/08	CSS	Gamma Emitters	
804145-03	Method Blank		7805-003	93A/93		05/03/08	05/05/08	BW	Gross Alpha in Water	
			7805-003	93B/93		05/03/08	05/05/08	BW	Gross Beta in Water	
		RC-007	7805-003	GAM		04/30/08	05/01/08	CSS	Gamma Emitters	
804145-04	Duplicate (R804145-01)		7805-004	93A/93		05/03/08	05/05/08	BW	Gross Alpha in Water	
04/21/08	182-N Basemenr Sump		7805-004	93B/93		05/03/08	05/05/08	BW	Gross Beta in Water	
04/25/08		RC-007	7805-004	GAM		04/30/08	05/01/08	CSS	Gamma Emitters	

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	RC-007	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	RC-007	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
GAM	RC-007	Gamma Emitters	GAMMA_GS	1			1	1	1	4
<b>TOTALS</b>				<b>3</b>			<b>3</b>	<b>3</b>	<b>3</b>	<b>12</b>

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LWS

Version 3.06

Report date 05/07/08



**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

7805-002

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7805</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG K1194</u> Contract No. <u>S00W235A00</u>
Lab sample id <u>R804145-02</u> Dept sample id <u>7805-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>WATER</u> SAF No <u>RC-007</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS	TEST	pCi/L	±	(TOTAL)	LIMITS
Gross Alpha	38.9	5.8	2.02	3.00		93A	34.0	1.4	114	56-144 70-130
Gross Beta	32.1	2.5	1.79	4.00		93B	31.1	1.2	103	78-122 80-120
Cobalt 60	432	18	12.9	25.0		GAM	438	18	99	86-114 80-120
Cesium 137	481	19	<u>15.7</u>	15.0		GAM	470	19	102	86-114 80-120

100N AnclryFclts&190DR ETF AnaDataRe

QC-LCS #65509

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>05/07/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

7805-004

J16MM2

**DUPLICATE**

SDG <u>7805</u>	Client/Case no <u>Hanford</u>	SDG <u>K1194</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R804145-04</u>	Lab sample id <u>R804145-01</u>	Client sample id <u>J16MM2</u>
Dept sample id <u>7805-004</u>	Dept sample id <u>7805-001</u>	Location/Matrix <u>182-N Basemenr Sump</u> <u>WATER</u>
	Received <u>04/25/08</u>	Collected/Volume <u>04/21/08 10:35</u> <u>1.0 L</u>
		Custody/SAF No <u>RC-007-025</u> <u>RC-007</u>

ANALYTE	DUPLICATE		MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	DER σ
	pCi/L	2σ ERR (COUNT)					pCi/L	2σ ERR (COUNT)					
Gross Alpha	0.200	0.78	1.48	3.00	U	93A	-0.304	0.82	1.94	U	-	0.9	
Gross Beta	3.96	1.3	1.74	4.00		93B	4.89	1.8	2.83		21	79	0.8
Potassium 40	U		225		U	GAM	U		56.2	U	-		1.5
Cobalt 60	U		7.27	25.0	U	GAM	U		5.53	U	-		0.4
Cesium 137	U		8.00	15.0	U	GAM	U		5.03	U	-		0.6
Radium 226	U		17.1		U	GAM	U		11.1	U	-		0.6
Radium 228	U		36.4		U	GAM	U		21.4	U	-		0.7
Europium 152	U		24.1	50.0	U	GAM	U		12.2	U	-		0.9
Europium 154	U		18.8	50.0	U	GAM	U		16.2	U	-		0.2
Europium 155	U		28.2	50.0	U	GAM	U		11.1	U	-		1.1
Thorium 228	U		15.1		U	GAM	U		7.62	U	-		0.9
Thorium 232	U		36.4		U	GAM	U		21.4	U	-		0.7
Uranium 235	U		43.9		U	GAM	U		17.7	U	-		1.1
Uranium 238	U		818		U	GAM	U		677	U	-		0.3
Americium 241	U		30.5		U	GAM	U		6.83	U	-		1.5
Antimony 125	U		19.8		U	GAM	U		11.3	U	-		0.7
Barium 133	U		9.76		U	GAM	U		5.54	U	-		0.8

100N AnclyrFclts&190DR ETF AnaDataRe

QC-DUP#1 65511

Lab id EBRLNE  
 Protocol Manford  
 Version Ver 1.0  
 Form DVD-DUP  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP K1194**

7805-001

J16MM2

**DATA SHEET**

SDG <u>7805</u>	Client/Case no <u>Hanford</u>	SDG <u>K1194</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>R804145-01</u>	Client sample id <u>J16MM2</u>	
Dept sample id <u>7805-001</u>	Location/Matrix <u>182-N Basemenr Sump</u>	<u>WATER</u>
Received <u>04/25/08</u>	Collected/Volume <u>04/21/08 10:35</u>	<u>1.0 L</u>
	Custody/SAF No <u>RC-007-025</u>	<u>RC-007</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.304	0.82	1.94	3.00	U	93A
Gross Beta	12587-47-2	4.89	1.8	2.83	4.00		93B
Potassium 40	13966-00-2	U		56.2		U	GAM
Cobalt 60	10198-40-0	U		5.53	25.0	U	GAM
Cesium 137	10045-97-3	U		5.03	15.0	U	GAM
Radium 226	13982-63-3	U		11.1		U	GAM
Radium 228	15262-20-1	U		21.4		U	GAM
Europium 152	14683-23-9	U		12.2	50.0	U	GAM
Europium 154	15585-10-1	U		16.2	50.0	U	GAM
Europium 155	14391-16-3	U		11.1	50.0	U	GAM
Thorium 228	14274-82-9	U		7.62		U	GAM
Thorium 232	TH-232	U		21.4		U	GAM
Uranium 235	15117-96-1	U		17.7		U	GAM
Uranium 238	U-238	U		677		U	GAM
Americium 241	14596-10-2	U		6.83		U	GAM
Antimony 125	14234-35-6	U		11.3		U	GAM
Barium 133	13981-41-4	U		5.54		U	GAM

100N AnclryFclts&190DR ETF AnaDataRe

DATA SHEETS

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SUMMARY DATA SECTION

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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>05/07/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

Test 93A Matrix WATER  
 SDG 7805  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1194

**LAB METHOD SUMMARY**

GROSS ALPHA IN WATER  
 GAS PROPORTIONAL COUNTING

**RESULTS**

AB	RAW	SUF-	AMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha
reparation batch 6148-098							
804145-01	93		7805-001		J16MM2		U
804145-02	93		7805-002		Lab Control Sample		ok
804145-03	93		7805-003		Method Blank		U
804145-04	93		7805-004		Duplicate (R804145-01)		- U

ominal values and limits from method RDLs (pCi/L) 3.00  
 00N AnclyFcits&190DR ETF AnaDataRe

**METHOD PERFORMANCE**

AB	RAW	SUF-	AMPLE ID	TEST FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
reparation batch 6148-098 2σ prep error 20.6 % Reference Lab Notebook #6148, pg. 98																	
804145-01	93		J16MM2			1.94	0.300			46		100			12	05/02/08	05/03 GRB-214
804145-02	93		Lab Control Sample			2.02	0.300			61		100				05/02/08	05/03 GRB-109
804145-03	93		Method Blank			1.99	0.300			60		100				05/02/08	05/03 GRB-110
804145-04	93		Duplicate (R804145-01)			1.48	0.300			44		100			12	05/02/08	05/03 GRB-111

ominal values and limits from method 3.00 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHA\_BETA\_GPC  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 1.86 ± 0.508  
 FOR 4 SAMPLES RESIDUE 53 ± 18

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

**LAB METHOD SUMMARY**

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 93B Matrix WATER  
 SDG 7805  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1194

**RESULTS**

LAB	RAW	SUF-	CLIENT SAMPLE ID	Gross Beta
SAMPLE ID	TEST FIX	PLANCHET		
reparation batch 6148-098				
304145-01	93	7805-001	J16MM2	4.89
304145-02	93	7805-002	Lab Control Sample	ok
304145-03	93	7805-003	Method Blank	U
304145-04	93	7805-004	Duplicate (R804145-01)	ok

nominal values and limits from method RDLs (pCi/L) 4.00  
 JON AnclyFclts&190DR ETF AnaDataRe

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
reparation batch 6148-098 2σ prep error 11.0 % Reference Lab Notebook #6148, pg. 98															
804145-01	93	J16MM2	2.83	0.300			46	100				12	05/02/08	05/03	GRB-214
804145-02	93	Lab Control Sample	1.79	0.300			61	100					05/02/08	05/03	GRB-109
804145-03	93	Method Blank	2.13	0.300			60	100					05/02/08	05/03	GRB-110
804145-04	93	Duplicate (R804145-01)	1.74	0.300			44	100				12	05/02/08	05/03	GRB-111

nominal values and limits from method 4.00 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 2.12 ± 1.00  
 FOR 4 SAMPLES RESIDUE 53 ± 18

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 05/07/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP K1194

Test GAM Matrix WATER  
 SDG 7805  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. S00W235A00  
 Contract SDG K1194

**LAB METHOD SUMMARY**

GAMMA EMITTERS  
 GAMMA SPECTROSCOPY

**RESULTS**

AB	RAW	SUF-	AMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
reparation batch 6148-098								
			304145-01		7805-001	J16MM2	U	U
			304145-02		7805-002	Lab Control Sample	ok	ok
			304145-03		7805-003	Method Blank	U	U
			304145-04		7805-004	Duplicate (R804145-01)	- U	- U

Minimal values and limits from method RDLs (pCi/L) 25.0 15.0  
 NON AnclryFcItts&190DR ETF AnaDataRe

**METHOD PERFORMANCE**

AB	RAW	SUF-	AMPLE ID	TEST FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
reparation batch 6148-098 2σ prep error 7.0 % Reference Lab Notebook #6148, pg. 98																	
			304145-01		J16MM2	<u>21.4</u>	0.500					796			8	04/29/08	04/29 01,01,00
			304145-02		Lab Control Sample	<u>15.7</u>	0.500					837				04/29/08	04/30 MB,06,00
			304145-03		Method Blank	<u>21.8</u>	0.500					837				04/29/08	04/30 MB,07,00
			304145-04		Duplicate (R804145-01)	<u>46.7</u>	0.500					304			9	04/29/08	04/30 01,02,00

Minimal values and limits from method 15.0 0.500 100 180

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

AVERAGES ± 2 SD MDA 26.4 ± 27.6  
 FOR 4 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 05/07/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K1194

SDG 7805  
 Contact Melissa C. Mannion

R E P O R T G U I D E

Client Hanford  
 Contract No. S00W235A00  
 Case no SDG K1194

S A M P L E S U M M A R Y

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

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

The following notes apply to these reports:

- \* LAB SAMPLE ID is the lab's primary identification for a sample.
- \* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- \* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- \* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

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

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

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SDG 7805  
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REPORT GUIDE

Client Hanford  
 Contract No. S00W235A00  
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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- \* The preparation batches are shown in the same order as the Method Summary Reports are printed.
- \* Only analyses of planchets relevant to the SDG are included.
- \* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- \* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

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

The following notes apply to this report:

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

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DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

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

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

The following values are underlined to indicate possible problems:

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

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DATA SHEET

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

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

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

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

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Preparation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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E B E R L I N E   S E R V I C E S / R I C H M O N D

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SDG 7805  
 Contact Melissa C. Mannion

G U I D E ,   c o n t .

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M E T H O D   S U M M A R Y

- \* 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

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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.

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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							Price Code	Data Turnaround	
Collector <b>STRICKLAND/SHERMAN</b>	Company Contact Amy Hood	Telephone No. 376-9759	Project Coordinator KESSNER, JH				Price Code	7K	Data Turnaround 15 Days		
Project Designation 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re		Sampling Location 182-N Basement Sump	<b>K1194 (7805)</b>				SAF No. RC-007				
Ice Chest No. <b>ERC-01-041</b>	Field Logbook No. EL-1516-12	COA RD4MXX2F00	Method of Shipment Fed Ex								
Shipped To <b>EBERLINE SERVICES / LIONVILLE</b>		Offsite Property No. <b>A080225</b>	Bill of Lading/Air Bill No. See OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS  Potential Rad			Preservation	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
Special Handling and/or Storage <i>Cool to 4C MA 4/24/08</i>			Type of Container	G/P	G/P	G/P	G/P	P	aG	G	aG
			No. of Container(s)	1	1	1	1	1	4	1	3
			Volume	1000mL	1000mL	60mL	500mL	500mL	1000mL	250mL	1000mL
SAMPLE ANALYSIS				Gross Alpha Gross Beta	See item (1) in Special Instructions.	RCF GEA Shipping Screen	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs #082	Ignitability - 1010	See item (4) in Special Instructions.
				<b>TRC 4-17-08</b>							
Sample No.	Matrix *	Sample Date	Sample Time								
J16MM2	WATER	4/21/08	1035	X	X						
CHAIN OF POSSESSION			Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *
Received By/Store In <i>R. E. Strickland</i>	Date/Time 4/21/08 1130	Received By/Store In <i>J.R. Anderson</i>	Date/Time 4-21-08 1130	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Barium-133, Radium-226, Radium-228) (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (3) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (4) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range); TPH-Diesel Range - WTPH-D - Add On (Total petroleum hydrocarbons - motor oil (high boiling))  Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.				S=Soil SE=Settiment SO=Solid SL=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wl=Wipe L=Liquid V=Vegetation X=Other			
Relinquished By/Removed From <i>J.R. Anderson</i>	Date/Time 4-21-08 1640	Received By/Store In <i>M.L. Mstankovich</i>	Date/Time 4-21-08 1640								
Relinquished By/Removed From <i>M.L. Mstankovich</i>	Date/Time 4/24/08 0945	Received By/Store In <i>Fed Ex</i>	Date/Time 4/24/08 0945								
Relinquished By/Removed From <i>Fed Ex</i>	Date/Time 4/24/08	Received By/Store In <i>Fed Ex</i>	Date/Time 04/25/08 09:30								
Relinquished By/Removed From	Date/Time	Received By/Store In	Date/Time								
LABORATORY SECTION	Received By	Title				Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time					



# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

*JK 4/25/08*

Client: W.C. HANFORD City MCHLAND State WA

Date/Time received 04/25/08 09:30 CoC No. RC-007-025

Container I.D. No. ERC-01-04 Requested TAT (Days) 15 P.O. Received Yes [ ] No [ ]

### INSPECTION

1. Custody seals on shipping container intact? Yes [] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry []
6. Number of samples in shipping container: 1 Sample Matrix W
7. Number of containers per sample: 2 (Or see CoC \_\_\_\_\_)
8. Samples are in correct container Yes [] No [ ]
9. Paperwork agrees with samples? Yes [] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels []
11. Samples are: In good condition [] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [] Not preserved [ ] pH \_\_\_\_\_ Preservative \_\_\_\_\_
13. Describe any anomalies:  
\_\_\_\_\_  
\_\_\_\_\_
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_
15. Inspected by *JK* Date: 04/25/08 Time: 10:30

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
<u>J16MM2</u>	<u>260</u>						

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. 100482 Calibration date 09/24/07



2 June 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 #	0804L002
SDG #	K1194
SAF #	RC-007
Date Received	4/25/08
# Samples	1
Matrix	WATER
Volatiles	
Semivolatiles	
Pest/PCB	X
Glycols	
DRO/KRO/GRO	X
GC Organics	
Herbicides	
Metals	X
Inorganics	X

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.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD RC-007 K1194



DATE RECEIVED: 04/25/08

LVL LOT # : 0804L802

CLIENT ID / ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
----------------------	-------	-----	--------	------------	-----------	----------	------------------

J16MM2

BROMIDE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	
BROMIDE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	
BROMIDE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	
CHLORIDE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	
CHLORIDE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	
CHLORIDE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	
FLUORIDE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	
FLUORIDE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	
FLUORIDE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	
NITRITE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	1930
NITRITE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	1942
NITRITE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	2030
NITRATE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	2006
NITRATE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	2018
NITRATE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	2030
PHOSPHATE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	1930
PHOSPHATE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	1942
PHOSPHATE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	2030
SULFATE BY IC	001	W	08LIC030	04/21/08	04/25/08	04/25/08	2006
SULFATE BY IC	001 REP	W	08LIC030	04/21/08	04/25/08	04/25/08	2018
SULFATE BY IC	001 MS	W	08LIC030	04/21/08	04/25/08	04/25/08	2030
IGNITABILITY	001	W	08LFP009	04/21/08	04/28/08	04/28/08	
PH	001	W	08LPH021	04/21/08	04/25/08	04/25/08	1210
PH	001 REP	W	08LPH021	04/21/08	04/25/08	04/25/08	1212

AB QC:

BROMIDE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08	
BROMIDE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08	
CHLORIDE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08	
CHLORIDE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08	
FLUORIDE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08	
FLUORIDE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08	
NITRITE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08	
NITRITE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08	

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD RC-007 K1194

DATE RECEIVED: 04/25/08

LVL LOT # :0804L002

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRATE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08
NITRATE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08
PHOSPHATE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08
PHOSPHATE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08
SULFATE BY IC	MB1	W	08LIC030	N/A	04/25/08	04/25/08
SULFATE BY IC	MB1 BS	W	08LIC030	N/A	04/25/08	04/25/08



## Analytical Report

Client: TNU-HANFORD RC-007 K1194  
LVL#: 0804L002

W.O.#: 11343-606-001-9999-00  
Date Received: 04-25-08

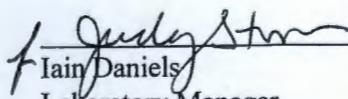
### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

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

Elevated reporting limit for Nitrite is the result of the necessity to dilute the sample to diminish co-elution effects.

3. Sample holding times as required by the method and/or contract were met with the exception of pH, Nitrite, Nitrate and Phosphate that were received past hold (see the sample chronology summary for analyses times for short hold samples).
4. The results presented in this report are derived from a sample that did not meet LvLI's sample acceptance policy with the exception of pH, Nitrite, Nitrate and Phosphate as noted on the Sample Receipt Checklist.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits with the exception of Phosphate that was above the 90-110% control limit however the associated sample results were below the reporting limit and therefore would not be considered biased high.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

  
Date

njp04-002

The results presented in this report relate to the analytical testing and conditions of the samples upon 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 13 pages.

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
idity	305.1		
Alkalinity ___ Bicarbonate ___ Carbonate	310.1		
OD	405.1		5210B (b)
Chromatography:			
Bromide <input checked="" type="checkbox"/> Chloride <input checked="" type="checkbox"/> Fluoride	300.0	9056	
Nitrate <input checked="" type="checkbox"/> Nitrite <input checked="" type="checkbox"/> Phosphate	300.0	9056	
Sulfate ___ Formate ___ Acetate ___ Oxalate	300.0	9056	
loride	325.2	9251	
orine, Residual	330.5 (mod)		
anide, Amenable to Chlorination	335.2	9010B	
anide, Total	335.2	9010B	9014 ILMO4.0 (e)
anide, Weak Acid Dissociable			412 (a) 4500CN-I (t)
OD	410.4(mod)		5220C (b)
lor	110.2		
orrosivity by Coupon		1110(mod)	
romium VI		7196A	3500Cr-D (b)
oride	340.2		4500-FC
rdness, Calcium	215.2		
rdness, Total	130.2		
lide			ASTM D19P202 (1)
rfectant	425.1		
Nitrate-Nitrite ___ Nitrate ___ Nitrite	353.2		
monia	350.3		
tal ___ Kjeldahl ___ Organic Nitrogen	351.3		
tal ___ Organic ___ Inorganic Carbon	415.1	9060	
l & Grease	413.1	9070	
pH ___ pH; paper	150.1	9040B	9041A
roleum Hydrocarbons, Total Recoverable	418.1		
enol	420.1	420.2	9065 9066
Ortho ___ Total Phosphate	365.2		4500-P B C
linity			210A (a) 2520 (b)
ttleable Solids	160.5		
lfide	376.1		9030B/9034 (acid soluble)
active ___ Cyanide ___ Sulfide		Section 7.3	(9014 9030B)
lica	370.1		
lfite	377.1		
lfate	375.4	9038	
ecific Conductance	120.1	9050A	
ecific Gravity			D5057-90 213E (a)
nthetic Precipitation Leach		1312	
tal ___ Dissolved ___ Suspended ___ Solids	160 .1 .2 .3		
tal Organic Halides	450.1	9020B	
rbidity	180.1		
olatile Solids:			
Total ___ Dissolved ___ Suspended	160.4		
ther: Ignitability		Method: SW1010	

# Lionville Laboratory Incorporated

## 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  
LC = Laboratory Control Sample.  
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

### ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
  - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
  - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
  - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
  - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
  - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
  - f. Code of Federal Regulations.

**Inorganic Data Summary Report  
Physical Testing Observation**

**Client:** TNU-HANFORD RC-007 K1194  
**LVL#:** 0804L002

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 04-25-08

**Analyte:**

Ignitability

**Observation:**

Samples J16MM2 and J16MM2 duplicate did not ignite.

The samples were heated to approximately 220°F.

p-Xylene was used to determine the accuracy of the ignitability apparatus. The p-Xylene will ignite at 81°F +/- 1°F. For this test, the p-Xylene ignited at 82°F.

njp\04-002.pt2



000000006

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/08/08

CLIENT: TNUHANFORD RC-007 K1194  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0804L002

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16MM2	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	13.1	MG/L	0.50	2.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.50 u	MG/L	0.50	2.0
		Nitrate by IC	0.57	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	3.3	MG/L	0.25	1.0
		pH	7.6	PH UNIT	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/08/08

CLIENT: TNUHANFORD RC-007 K1194  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0804L002

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	08LIC030-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/08/08

CLIENT: TNUHANFORD RC-007 K1194  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0804L002

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	J16MM2	Bromide by IC	8.6	0.00	10.0	85.8	2.0
		Chloride by IC	35.2	13.1	25.0	88.5	5.0
		Fluoride by IC	8.9	0.12	10.0	87.9	2.0
		Nitrite by IC	10.0	0.50u	10.0	100.4	5.0
		Nitrate by IC	9.31	0.57	10.0	87.4	2.0
		Phosphate by IC	11.1	0.25u	10.0	110.8	2.0
		Sulfate by IC	14.6	3.3	10.0	112.6	2.0
BLANK10	08LIC030-MB1	Bromide by IC	4.9	0.25u	5.0	97.0	1.0
		Chloride by IC	4.8	0.25u	5.0	95.4	1.0
		Fluoride by IC	5.0	0.25u	5.0	101.0	1.0
		Nitrite by IC	4.52	0.25u	5.00	90.3	1.0
		Nitrate by IC	4.91	0.25u	5.00	98.1	1.0
		Phosphate by IC	5.8	0.25u	5.0	115.0	1.0
		Sulfate by IC	5.0	0.25u	5.0	99.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/08/08

CLIENT: TNUHANFORD RC-007 K1194  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0804L002

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J16MM2	Bromide by IC	0.25u	0.25u	NC	1.0
		Chloride by IC	13.1	13.5	3.6	2.0
		Fluoride by IC	0.25u	0.25u	NC	1.0
		Nitrite by IC	0.50u	0.50u	NC	2.0
		Nitrate by IC	0.57	0.58	2.4	1.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	3.3	3.2	2.8	1.0
		pH	7.6	7.6	0.1	1.0



**Washington Closure Hanford**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Collector <b>SRIKLAND/SHERMAN</b>	Company Contact Amy Hood	Telephone No. 376-9759	Project Coordinator KESSNER, JH	Pricing Code <b>7K</b>	Data Turnaround <b>15 Days</b>
Project Designation 100-N Ancillary Facilities & 190-DR ETF Analytical Data Rec	Sampling Location 182-N Basement Sump	Field Logbook No. EL-1516-12	SAF No. RC-007		
Field Cheat No. <b>AFS-04-053</b>	Field Logbook No. EL-1516-12	COA RD4MXX2F00	Method of Shipment Fed Ex		
Shipped To EDERLINE SERVICES (LIONVILLE)	Offsite Property No. <b>A080241</b>	Bill of Lading/Air Bill No. See OSPC			

Possible Sample Hazards/Remarks Potential Rad Special Handling and/or Storage Cool to 4c	Preservation	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
	Type of Container	G/P	G/P	G/P	G/P	P	aG	G	aG
	No. of Container(s)	1	1	1	1	1	4	1	3
	Volume	1000mL	1000mL	60mL	500mL	500mL	1000mL	250mL	1000mL

SAMPLE ANALYSIS	Gross Alpha: Gross Beta	See item (1) in Special Instructions. <b>TRC 4-17-08</b>	RCF GEA Shipping Screen	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Ignitability - 1010	See item (4) in Special Instructions.
-----------------	-------------------------	---	-------------------------	---------------------------------------	---------------------------------------	-------------	---------------------	---------------------------------------

Sample No.	Matrix *	Sample Date	Sample Time	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
18MM2	WATER	4/21/08	1035				X	X	X	X	X

<b>CHAIN OF POSSESSION</b>		<b>Sign/Print Names</b>		<b>SPECIAL INSTRUCTIONS</b>		<b>Matrix *</b> S=Soil SR=Soil/Residue SD=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time Wt=Wipe L=Liquid V=Vegetation X=Other
Received By/Date/Time <i>[Signature]</i> 4/21/08 1130	Received By/Date/Time <i>[Signature]</i> 4-21-08 1130	Received By/Date/Time <i>[Signature]</i> 4-21-08 1640	Received By/Date/Time <i>[Signature]</i> 4-21-08 1640	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Barium-133, Radium-226, Radium-228) (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (3) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (4) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range); TPH-Diesel Range - WTPH-D - Add On (Total petroleum hydrocarbons - motor oil (high boiling))  Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.		
Received By/Date/Time <i>[Signature]</i> 4/24/08 0930						
Received By/Date/Time <i>[Signature]</i> 4-25-08 0955						
Received By/Date/Time <i>[Signature]</i> 4-25-08 0955						
Received By/Date/Time <i>[Signature]</i> 4-25-08 0955						

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

00000012

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

CLIENT: TNU HANFORD  
 Project/SAF/SOW/Release #: RC-007

Date: 4-25-08

LvLI Batch #: 0804L002

Sample Custodian: [Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |   |
|---|---|---|
| 1. Samples Hand Delivered <u>Shipped?</u>   | Carrier <u>FEDEX</u>  | Airbill # <u>798927203313</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 cooled or ambient?  | Temp <u>2°</u> °C   | Cooler # <u>AFS-04-053</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 type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> No Seals   |
| 7. COC (Client & LvLI) signed & dated?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   |   |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   |   |
| 9. All samples on COC received?<br>All samples received on COC?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No            |   |
| 10. All sample label information matches COC?   | <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 checked="" type="checkbox"/> No<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <u>PH, NO<sub>2</sub>, NO<sub>3</sub>, PO<sub>4</sub></u><br><input 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<br><u>18 5-14-08</u>  | <input checked="" type="checkbox"/> No<br><u>see #12</u>                                  |
| 16. Project Manager contacted concerning any discrepancies?<br>Person Contacted _____   | <input type="checkbox"/> Yes  | <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A<br>Date _____         |



Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNU-HANFORD RC-007 *K1194*



DATE RECEIVED: 04/25/08

LVL# LOT# : 08041802

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16MM2						
SILVER, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
SILVER, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
SILVER, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
ALUMINUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
ALUMINUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
ALUMINUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
ARSENIC, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
ARSENIC, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
ARSENIC, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
BARIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
BARIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
BARIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
BERYLLIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
BERYLLIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
BERYLLIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
CALCIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
CALCIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
CALCIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
CADMIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
CADMIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
CADMIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
CHROMIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
CHROMIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
CHROMIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
COPPER, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
COPPER, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
COPPER, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
IRON, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
IRON, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
IRON, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
MERCURY, TOTAL	001	W	08C0077	04/21/08	05/01/01	05/01/01
MERCURY, TOTAL	001 REP	W	08C0077	04/21/08	05/01/01	05/01/01
MERCURY, TOTAL	001 MS	W	08C0077	04/21/08	05/01/01	05/01/01
POTASSIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
POTASSIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNU-HANFORD RC-007

DATE RECEIVED: 04/25/08

LVL LOT # :0804L002

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
POTASSIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
LITHIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
LITHIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
LITHIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
MAGNESIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
MAGNESIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
MAGNESIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
MANGANESE, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
MANGANESE, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
MANGANESE, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
SODIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
SODIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
SODIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
NICKEL, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
NICKEL, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
NICKEL, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
LEAD, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
LEAD, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
LEAD, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
SILICA, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
SILICA, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
SILICA, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
ANTIMONY, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
ANTIMONY, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
ANTIMONY, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
SELENIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
SELENIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
SELENIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
VANADIUM, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
VANADIUM, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
VANADIUM, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08
ZINC, TOTAL	001	W	08L0175	04/21/08	05/01/08	05/01/08
ZINC, TOTAL	001 REP	W	08L0175	04/21/08	05/01/08	05/01/08
ZINC, TOTAL	001 MS	W	08L0175	04/21/08	05/01/08	05/01/08

LAB QC:

SILVER LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
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Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNU-HANFORD RC-007

DATE RECEIVED: 04/25/08

LVL LOT # :0804L002

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
ALUMINUM LABORTORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
ALUMINUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
ARSENIC LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
ARSENIC, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
BARIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
BARIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
BERYLLIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
BERYLLIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
CALCIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
CALCIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
CADMIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
CADMIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
CHROMIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
CHROMIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
COPPER LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
COPPER, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
IRON LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
IRON, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
MERCURY LABORATORY	LC1 BS	W	08C0077	N/A	05/01/01	05/01/01
MERCURY, TOTAL	MB1	W	08C0077	N/A	05/01/01	05/01/01
MERCURY, TCLP LEACHA	MB2	W	08C0077	N/A	05/01/01	05/01/01
MERCURY, TCLP LEACHA	MB3	W	08C0077	N/A	05/01/01	05/01/01
POTASSIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
POTASSIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
LITHIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
LITHIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
MAGNESIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
MAGNESIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
MANGANESE LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
MANGANESE, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
SODIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
SODIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
NICKEL LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
NICKEL, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
LEAD LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
LEAD, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
SILICA LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNU-HANFORD RC-007

DATE RECEIVED: 04/25/08

LVL LOT # :0804L002

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILICA, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
ANTIMONY LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
ANTIMONY, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
SELENIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
SELENIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
VANADIUM LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
VANADIUM, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08
ZINC LABORATORY	LC1 BS	W	08L0175	N/A	05/01/08	05/01/08
ZINC, TOTAL	MB1	W	08L0175	N/A	05/01/08	05/01/08



## Analytical Report

Client: TNU-HANFORD RC-007  
LVL#: 0804L002  
SDG/SAF#: K1194/RC-007

W.O.#: 11343-606-001-9999-00  
Date Received: 04-25-08

### 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.

1. This narrative covers the analysis of 1 water sample.
2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

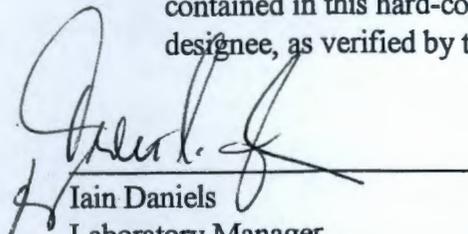
All samples were rerun for Aluminum, Iron, Potassium, Sodium, and Zinc on a different instrument. Potassium, and Sodium were rerun in file PS0501C due to CCVs that were outside the 90-110% control limits. Aluminum, Iron, and Zinc were also rerun in file PS0501C due to sample matrix.

3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) for all data contained within this report.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
7. All preparation/method blanks (MB) were within method criteria {less than the Limit of Quantitation (3-10X the LOD), all sample concentrations were greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

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 19 pages.



10. ~~All matrix spike (MS) recoveries for all analytes were within the 75-125% control limits.~~  
Refer to the Inorganics Accuracy Report.
11. All duplicate analysis for all analytes were within 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

5/13/08  
Date

alm/m04-002

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within the lot#: 0804002

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

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

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

## Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	6010B	200.7			99
Antimony	6010B 7041 <sup>s</sup>	200.7 204.2			99
Arsenic	6010B 7060A <sup>s</sup>	200.7 206.2	3113B		99
Barium	6010B	200.7			99
Beryllium	6010B	200.7		1620	99
Bismuth	6010B <sup>1</sup>	200.7 <sup>1</sup>			99
Boron	6010B	200.7			99
Cadmium	6010B 7131A <sup>s</sup>	200.7 213.2			99
Calcium	6010B	200.7			99
Chromium	6010B 7191 <sup>s</sup>	200.7 218.2			SS17
Cobalt	6010B	200.7			99
Copper	6010B 7211 <sup>s</sup>	200.7 220.2			99
Cron	6010B	200.7			99
Lead	6010B 7421 <sup>s</sup>	200.7 239.2	3113B		99
Lithium	6010B 7430 <sup>4</sup>	200.7		1620	99
Magnesium	6010B	200.7			99
Manganese	6010B	200.7			99
Mercury	7470A <sup>3</sup> 7471A <sup>3</sup>	245.1 <sup>3</sup> 245.5 <sup>2</sup>			99
Molybdenum	6010B	200.7			99
Nickel	6010B	200.7			99
Potassium	6010B 7610 <sup>4</sup>	200.7 258.1 <sup>4</sup>		1620	99
Rare Earths	6010B <sup>1</sup>	200.7 <sup>1</sup>			99
Selenium	6010B 7740 <sup>s</sup>	200.7 270.2	3113B		99
Silicon	6010B <sup>1</sup>	200.7		1620	99
Silica	6010B	200.7		1620	99
Silver	6010B 7761 <sup>s</sup>	200.7 272.2			99
Sodium	6010B 7770 <sup>4</sup>	200.7 273.1 <sup>4</sup>			99
Strontium	6010B	200.7			99
Thallium	6010B 7841 <sup>s</sup>	200.7 279.2 200.9			99
Tin	6010B	200.7			99
Titanium	6010B	200.7		1620	99
Tungsten	6010B <sup>1</sup>	200.7 <sup>1</sup>			99
Vanadium	6010B	200.7			99
Zinc	6010B	200.7		1620	99
Zirconium	6010B <sup>1</sup>	200.7 <sup>1</sup>			99

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 05/05/08

CLIENT: TNU-HANFORD RC-007

LVL LOT #: 0804L002

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J16MM2	Silver, Total	1.0	u UG/L	1.0	1.0
		Aluminum, Total	40.0	u UG/L	40.0	1.0
		Arsenic, Total	5.0	u UG/L	5.0	1.0
		Barium, Total	12.0	UG/L	1.0	1.0
		Beryllium, Total	0.50	u UG/L	0.50	1.0
		Calcium, Total	17900	UG/L	40.0	1.0
		Cadmium, Total	0.50	u UG/L	0.50	1.0
		Chromium, Total	2.0	u UG/L	2.0	1.0
		Copper, Total	6.5	UG/L	2.0	1.0
		Iron, Total	217	UG/L	45.0	1.0
		Mercury, Total	0.06	u UG/L	0.06	1.0
		Potassium, Total	4800	UG/L	493	1.0
		Lithium, Total	2.9	UG/L	0.40	1.0
		Magnesium, Total	681	UG/L	25.0	1.0
		Manganese, Total	2.9	UG/L	0.40	1.0
		Sodium, Total	22100	UG/L	20.0	1.0
		Nickel, Total	2.0	u UG/L	2.0	1.0
		Lead, Total	3.0	u UG/L	3.0	1.0
		SILICA , Total	4020	UG/L	84.0	2.1
		Antimony, Total	3.0	u UG/L	3.0	1.0
		Selenium, Total	6.0	u UG/L	6.0	1.0
		Vanadium, Total	1.4	u UG/L	1.4	1.0
		Zinc, Total	76.4	UG/L	6.0	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/05/08

CLIENT: TNU-HANFORD RC-007

LVL LOT #: 0804L002

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0175-MB1	Silver, Total	1.0	u UG/L	1.0	1.0
		Aluminum, Total	47.6	UG/L	40.0	1.0
		Arsenic, Total	5.0	u UG/L	5.0	1.0
		Barium, Total	1.0	u UG/L	1.0	1.0
		Beryllium, Total	0.50	u UG/L	0.50	1.0
		Calcium, Total	77.4	UG/L	40.0	1.0
		Cadmium, Total	0.50	u UG/L	0.50	1.0
		Chromium, Total	2.0	u UG/L	2.0	1.0
		Copper, Total	2.0	u UG/L	2.0	1.0
		Iron, Total	45.0	u UG/L	45.0	1.0
		Potassium, Total	493	u UG/L	493	1.0
		Lithium, Total	0.40	u UG/L	0.40	1.0
		Magnesium, Total	41.9	UG/L	25.0	1.0
		Manganese, Total	0.44	UG/L	0.40	1.0
		Sodium, Total	227	UG/L	20.0	1.0
		Nickel, Total	2.0	u UG/L	2.0	1.0
		Lead, Total	3.0	u UG/L	3.0	1.0
		SILICA, Total	84.0	u UG/L	84.0	2.1
		Antimony, Total	3.0	u UG/L	3.0	1.0
		Selenium, Total	6.0	u UG/L	6.0	1.0
		Vanadium, Total	1.4	u UG/L	1.4	1.0
		Zinc, Total	6.0	u UG/L	6.0	1.0
BLANK1	08C0077-MB1	Mercury, Total	0.06	u UG/L	0.06	1.0
BLANK2	08C0077-MB2	Mercury, TCLP Leachate	0.06	u UG/L	0.06	1.0
BLANK3	08C0077-MB3	Mercury, TCLP Leachate	0.06	u UG/L	0.06	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/05/08

CLIENT: TNU-HANFORD RC-007

LVL LOT #: 0804L002

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J16MM2	Silver, Total	48.2	1.0 u	50.0	96.4	1.0
		Aluminum, Total	2110	40.0 u	2000	105.6	1.0
		Arsenic, Total	1900	5.0 u	2000	94.8	1.0
		Barium, Total	1980	12.0	2000	98.6	1.0
		Beryllium, Total	48.2	0.50u	50.0	96.4	1.0
		Calcium, Total	41900	17900	25000	96.2	1.0
		Cadmium, Total	47.9	0.50u	50.0	95.8	1.0
		Chromium, Total	195	2.0 u	200	97.4	1.0
		Copper, Total	254	6.5	250	98.8	1.0
		Iron, Total	1240	217	1000	102.6	1.0
		Mercury, Total	0.96	0.06u	1.0	96.0	1.0
		Potassium, Total	31400	4800	25000	106.4	1.0
		Lithium, Total	1090	2.9	1000	108.5	1.0
		Magnesium, Total	24700	681	25000	96.0	1.0
		Manganese, Total	498	2.9	500	99.1	1.0
		Sodium, Total	50000	22100	25000	111.7	1.0
		Nickel, Total	477	2.0 u	500	95.4	1.0
		Lead, Total	478	3.0 u	500	95.7	1.0
		SILICA , Total	5860	4020	2140	86.2	2.1
		Antimony, Total	486	3.0 u	500	97.1	1.0
		Selenium, Total	1710	6.0 u	2000	85.3	1.0
		Vanadium, Total	485	1.4 u	500	97.1	1.0
		Zinc, Total	578	76.4	500	100.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/05/08

CLIENT: TNU-HANFORD RC-007

LVL LOT #: 0804L002

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J16MM2	Silver, Total	1.0 u	1.0 u	NC	1.0
		Aluminum, Total	40.0 u	58.3	NC	1.0
		Arsenic, Total	5.0 u	5.0 u	NC	1.0
		Barium, Total	12.0	11.8	1.7	1.0
		Beryllium, Total	0.50u	0.50u	NC	1.0
		Calcium, Total	17900	18200	1.7	1.0
		Cadmium, Total	0.50u	0.50u	NC	1.0
		Chromium, Total	2.0 u	2.0 u	NC	1.0
		Copper, Total	6.5	6.3	3.1	1.0
		Iron, Total	217	200	8.4	1.0
		Mercury, Total	0.06u	0.06u	NC	1.0
		Potassium, Total	4800	4800	0.15	1.0
		Lithium, Total	2.9	2.6	10.9	1.0
		Magnesium, Total	681	697	2.3	1.0
		Manganese, Total	2.9	2.6	10.9	1.0
		Sodium, Total	22100	22200	0.23	1.0
		Nickel, Total	2.0 u	2.0 u	NC	1.0
		Lead, Total	3.0 u	3.0 u	NC	1.0
		SILICA , Total	4020	4090	1.7	2.1
		Antimony, Total	3.0 u	3.0 u	NC	1.0
		Selenium, Total	6.0 u	6.0 u	NC	1.0
		Vanadium, Total	1.4 u	1.4 u	NC	1.0
		Zinc, Total	76.4	74.3	2.8	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/05/08

CLIENT: TNU-HANFORD RC-007

LVL LOT #: 0804L002

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	08L0175-LC1	Silver, LCS	491	500	UG/L	98.2
		Aluminum, LCS	5210	5000	UG/L	104.2
		Arsenic, LCS	9480	10000	UG/L	94.8
		Barium, LCS	4960	5000	UG/L	99.3
		Beryllium, LCS	243	250	UG/L	97.3
		Calcium, LCS	24800	25000	UG/L	99.3
		Cadmium, LCS	239	250	UG/L	95.7
		Chromium, LCS	487	500	UG/L	97.4
		Copper, LCS	1240	1250	UG/L	98.8
		Iron, LCS	5070	5000	UG/L	101.3
		Potassium, LCS	24900	25000	UG/L	99.6
		Lithium, LCS	5210	5000	UG/L	104.3
		Magnesium, LCS	24300	25000	UG/L	97.3
		Manganese, LCS	744	750	UG/L	99.1
		Sodium, LCS	25900	25000	UG/L	103.6
		Nickel, LCS	1930	2000	UG/L	96.7
		Lead, LCS	2410	2500	UG/L	96.3
		SILICA, LCS	9900	10700	UG/L	92.6
		Antimony, LCS	2910	3000	UG/L	97.0
		Selenium, LCS	9610	10000	UG/L	96.1
		Vanadium, LCS	2440	2500	UG/L	97.6
		Zinc, LCS	1000	1000	UG/L	100.4
LCS1	08C0077-LC1	Mercury, LCS	5.1	5.0	UG/L	102.0

SAMPLE DIGESTION RECORD

SOP: L-SPI-3020 Rev. 00

Digestion Batch #: 08L0175  
 Date/Time Initiated: 5/1/08 1100  
 Date/Time Completed: 5/1/08 1500  
 Analyst(s): MW  
 Matrix: Soil  Water  Other:   
 Instr. Type: AA (ICP)  
 Parameters: See backlog

Method: SW  
 (circle)

3005A

3010A

3015

3020A

7060A (As/Se)

7760A (Ag)

3050B

3051

DW 200.7 (1994)

200.9

3113B

MCAWW 200.7 (1982)

200 (AA)

206.2 (As/Se)

SM 3030C (NC)

Digested /  Undigested (circle one)

Balance #: N/A

Balance Cal Verif: Y (NA)

Hot Plate Temp: 92°

W.E.

CLP ILMO3.0

ILMO4.0

Other filler

MW/ESI-Hco

COC Batch #	Spike Vol(s) (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH	Type: To/Sol/TC	Texture	Color/Appearance	Artifact	Turb
0804L963-001		10ml	50ml	7.2	70	N/A	brown sediment		
001R			100						
001S	1.0ml								
002							trace sediment		
0804L907-001		100ml		7.2			clean/colorless		
001R									
001S	1.0ml								
08L0175-MB1									
LC1	1.0ml								

MW 5/1/08

Spiking IDs:

MS #: 8100-04-01  
02  
03  
6072-78-07  
 LCS #: 08  
09  
10  
11

Reagent IDs:

HNO<sub>3</sub> E46025  
 HCL E45047  
 H<sub>2</sub>O<sub>2</sub>  
 1:1 HNO<sub>3</sub>  
 1:1 HCL

File ID#:

IC017501  
IC017502  
 LIMS Transfer:  Updated  
 Data Review By/Date: PMP, 05/02/08

# MERCURY PREPARATION

Logbook # 422

Instrument ID HL3.1

Prep Batch: 080077

Balance #: (NA)

Worksheet: HL050101

Pipette Calibration (Daily) Y

SOP No. ME-HqCVA, Rev. 02

020  
5/1/08  
 ne/Temp: 13.5 | 98°  
 re/Temp: 15.5 | 98°

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

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

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
Blank	JT			33mL	33mL	
0.2 µg/L	A27	0.0667				
1.0	PC	0.334				
2.0	BLV	0.667				
5.0	508	1.667				
10.0	A1	3.334				
100	194	0.2834	2.5			
CCW	B14	0.167	5.0			
100/100	K17					
MSI	R					PBW177
LLI	A901	0.167	5.0			LCSW177
0804L002-001	WK					
WIR	573					
0015	ET	0.334	1.0			
0804L998-004	76					
004R	154					
0045	R2	0.334	1.0			
009	AP					
014	X0					
0804L023-004	CM					
0804L020-006	L53					
017	71L					
0804L958-004	P18					
0045	297	0.667	2.00			
005	857					
006	N60					
0804L929-002	AIR					

ID	Prep Date/Time
R16077-78-14B	5/1/08 1105
LCS 45602-78-15A	I

Reviewed By/Date: [Signature] 5/1/08

see book # 9368 for std traceability information

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

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

enville Laboratory  
orporated

# MERCURY PREPARATION

Logbook # 422

Analyst: DN  
 Date: 5/11/08  
 Start Time/Temp: \_\_\_\_\_  
 End Time/Temp: 5:00 PM

Instrument ID: HG-3.1  
 Balance #: \_\_\_\_\_  
 Pipette Calibration (Daily) Y  NA

Prep Batch: 08C0077  
 Worksheet: HGAS101  
 SOP No. ME-HgCVAA, Rev. 02

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

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

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
0804L929-002R	H5			33mL	33mL	
002S	B6	0.667	200			
0804L989-003	JS					
003R	5T					
003S	95	0.667	200			
004	S					
0804L991-002	HW			16.5mL		init's vol
002R	55					
002S	TR	0.667	200			
0804L976-002	3T			33mL		
002R	PT					
002S	KX	0.667	200			
08LTD032-LB1	F8					
08LTD034 <sup>5</sup> -LB1	T4					
<u>DN</u> <u>5/11/08</u>						
<u>5/25/08</u>						

Standard:	ID	Prep Date/Time
CAL/MS		
CV/CCV/LCS	<u>See page 090</u>	

Reviewed By/Date: [Signature] 5/17/08

see book # 9368 for std traceability information

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

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



<b>Washington Closure Hanford</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			KCC-001-043	
Director <b>TRICKLAND/SHERMAN</b>		Company Contact Amy Hood	Telephone No. 376-9759	Project Coordinator KESSNER, JH	Price Code <b>7K</b>	Data Turnaround <b>15 Days</b>
Project Designation 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re		Sampling Location 182-N Basement Sump		SAF No. RC-007		
Chest No. <b>AFS-04-053</b>		Field Logbook No. EL-1516-12	COA RD4MXX2F00	Method of Shipment Fed Ex		
Assigned To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. <b>A080241</b>		Bill of Lading/Air Bill No. See OSCP		

<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>  Potential Rad  Special Handling and/or Storage Cool to 4c	<b>Preservation</b>	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
	<b>Type of Container</b>	G/P	G/P	G/P	G/P	P	aG	G	aG
	<b>No. of Container(s)</b>	1	1	1	1	1	4	1	3
	<b>Volume</b>	1000mL	1000mL	60mL	500mL	500mL	1000mL	250mL	1000mL

<b>SAMPLE ANALYSIS</b>				Gross Alpha; Gross Beta	See item (1) in Special Instructions.  TRE 4-17-08	RCF GEA Shipping Screen	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Ignitability - 1010	See item (4) in Special Instructions.
<b>Sample No.</b>	<b>Matrix *</b>	<b>Sample Date</b>	<b>Sample Time</b>								
6MM2	WATER	4/24/08	1035				X	X	X	X	X

CHAIN OF POSSESSION		Sign/Print Names	
Received By/Date/Time	Received By/Date/Time	Received By/Date/Time	Received By/Date/Time
<i>[Signature]</i> 4/21/08 1130	<i>[Signature]</i> 4-21-08 1130	<i>[Signature]</i> 4-21-08 1640	<i>[Signature]</i> 4-21-08 1640
<i>[Signature]</i> 4-21-08 1640	<i>[Signature]</i> 4-21-08 1640	<i>[Signature]</i> 4/24/08 0930	<i>[Signature]</i> 4/24/08 0930
<i>[Signature]</i> 4/24/08 0930	<i>[Signature]</i> 4/24/08 0930	<i>[Signature]</i> 4/25/08 0955	<i>[Signature]</i> 4-25-08 0955
<i>[Signature]</i> 4-25-08 0955	<i>[Signature]</i> 4-25-08 0955		

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Barium-133, Radium-226, Radium-228)

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)

(3) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040

(4) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range); TPH-Diesel Range - WTPH-D - Add On (Total petroleum hydrocarbons - motor oil (high boiling))

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

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

000000018

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

CLIENT: TNU Hanford  
Project/SAF/SOW/Release #: RC-007

Date: 4-25-06

LvLI Batch #: 0804L002

Sample Custodian: [Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |  |
|---|---|--|
| 1. Samples Hand Delivered or <u>Shipped?</u>  | Carrier <u>Fed Ex</u>                   | Airbill # <u>7989 2720 3313</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 <i>Comments:</i>                                   |
| 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 cooled or ambient?  | Temp <u>2°</u>                          | °C      Cooler # <u>AFS-04-053</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? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No <u>PH</u>                               |
| 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.  
DRO ANALYTICAL DATA PACKAGE FOR  
TNU-HANFORD RC-007 **K1194**

DATE RECEIVED: 04/25/08

LVL LOT # : 08049-002

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16MM2	001	W	08LE0205	04/21/08	04/28/08	05/03/08
J16MM2	001 MS	W	08LE0205	04/21/08	04/28/08	05/03/08
J16MM2	001 MSD	W	08LE0205	04/21/08	04/28/08	05/03/08

LAB QC:

BLK	MB1	W	08LE0205	N/A	04/28/08	05/02/08
BLK	MB1 BS	W	08LE0205	N/A	04/28/08	05/02/08



## Case Narrative

Client: TNU-HANFORD RC-007  
LVL #: 0804L002  
SDG/SAF # *K1194* / RC-007

W.O. #: 11343-606-001-9999-00  
Date Received: 04-25-2008

### DIESEL RANGE ORGANICS

One (1) water samples was collected on 04-21-2008.

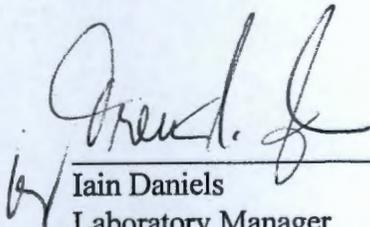
The sample and its associated QC samples were extracted on 04-28-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 05-02,03-2008. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8015B.

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. All required holding times for extraction and analysis have been met..
2. The method blank was below the reporting limits for all target compounds.
3. All surrogate recoveries were within acceptance criteria.
4. The blank spike recoveries were within acceptance criteria.
5. The matrix spike recoveries were within acceptance criteria.
6. All initial calibrations associated with this data set were within acceptance criteria.
7. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
8. 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.



9. 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

5/13/08  
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.



SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 04/28/08

Extraction Batch No: 08LE0205

Analyst: MF

Method: CONT3520

Test: ODRO

Cleanup Date:

Analyst:

Client: TNU-HANFORD RC-007

LIMS Report Date: 05/02/08

Solvent: DCM, HEXANE

Adsorbent:

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
0804L002-	TNU-HANFORD RC-007										
001	J16MM2	2	1000	1.0		1.0		1.0	N	0.0	1.00
001 -S	J16MM2	2	1000	1.0	1.0	1.0		1.0	N	0.0	1.00
001 -T	J16MM2	2	500	1.0	1.0	1.0		1.0	N	0.0	2.00
0804L978-	TNU-HANFORD RC007										
001	J16MM4	2	1000	1.0		1.0		1.0	N	0.0	1.00
08LE0205-MB1	BLK	7	1000	1.0		1.0		1.0	N	0.0	1.00
08LE0205-MB1 -S	BLK	7	1000	1.0	1.0	1.0		1.0	N	0.0	1.00

Comments:

Surrogate: 1.0 ML ODRO SURR 86971901

Spike: 1.0 ML ODRO DIESEL SPIKE 86971902

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
<i>all</i>	<i>[Signature]</i>	<i>5/2/08 15:15</i>	<i>SZ</i>	<i>5/2/08 15:15</i>	<i>GC</i>

000000006



<b>Washington Closure Hanford</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				Price Code <b>7K</b>		Data Turnaround <b>15 Days</b>		
Collector <b>STRICKLAND/SHERMAN</b>	Company Contact Amy Hood	Telephone No. 376-9759	Project Coordinator KESSNER, JH		SAF No. RC-007					
Project Designation 100-N Ancillary Facilities & 190-DR ETF Analytical Data Re	Sampling Location 182-N Basement Sump		Method of Shipment Fed Ex							
Chest No. <b>AFS-04-053</b>	Field Logbook No. EL-1516-12	COA RD4MXX2F00		Bill of Lading/Air Bill No. See OSPC						
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. <b>A080241</b>								

POSSIBLE SAMPLE HAZARDS/REMARKS  Potential Rad  Special Handling and/or Storage Cool to 4c	Preservation	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
	Type of Container	G/P	G/P	G/P	G/P	P	aG	G	aG
	No. of Container(s)	1	1	1	1	1	4	1	3
	Volume	1000mL	1000mL	60mL	500mL	500mL	1000mL	250mL	1000mL

SAMPLE ANALYSIS				Gross Alpha; Gross Beta	See item (1) in Special Instructions.	RCF GEA Shipping Screen	See item (2) in Special Instructions.	See item (3) in Special Instructions.	PCBs - 8082	Ignitability - 1010	See item (4) in Special Instructions.
					TRE 4-17-08						

Sample No.	Matrix *	Sample Date	Sample Time							
16MM2	WATER	4/21/08	1035			X	X	X	X	X

CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Received By <i>[Signature]</i>	Date/Time 4/21/08 1130	Received By/Store In <i>[Signature]</i>	Date/Time 4-21-08 1130	(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Barium-133, Radium-226, Radium-228) (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (3) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040 (4) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range); TPH-Diesel Range - WTPH-D - Add On (Total petroleum hydrocarbons - motor oil (high boiling))  Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.		S=Soil SS=Soil/Sludge SO=Soil SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace WI=Wipe L=Liquid V=Vegetation X=Other	
Received By/Removed From <i>[Signature]</i>	Date/Time 4-21-08 1640	Received By/Store In <i>[Signature]</i>	Date/Time 4-21-08 1640				
Received By/Removed From <i>[Signature]</i>	Date/Time 4/24/08 0930	Received By/Store In <i>[Signature]</i>	Date/Time 4/24/08 0930				
Received By/Removed From <i>[Signature]</i>	Date/Time 4/24/08 0930	Received By/Store In <i>[Signature]</i>	Date/Time 4/24/08 0930				
Received By/Removed From <i>[Signature]</i>	Date/Time 4-25-08 0955	Received By/Store In <i>[Signature]</i>	Date/Time 4-25-08 0955				

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

0000000000

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

CLIENT: TNU HANFORD  
 Project/SAF/SOW/Release #: RC-007

Date: 4-25-06

LvLI Batch #: 0804002

Sample Custodian: [Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |  |
|---|---|--|
| 1. Samples Hand Delivered <u>or Shipped?</u>  | Carrier <u>FEDEX</u>                    | Airbill # <u>798927203313</u>                    |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated?  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No Seals                |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes | 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 cooled or ambient?  | Temp <u>2°</u> °C                       | Cooler # <u>AFS-04-053</u>                       |
| How was the temperature taken?  | <input checked="" type="checkbox"/> IR  | <input type="checkbox"/> Temp. Blank             |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> Other (Specify):        |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes | <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? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No <u>PH</u> |
| 13. VOA, TOC, TOX free of headspace?  | <input type="checkbox"/> Yes            | <input type="checkbox"/> No <u>N/A</u>           |
| 14. QC stickers placed on bottles designated by client?   | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No <u>N/A</u>           |
| 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 <u>N/A</u>           |
| Person Contacted _____  | Date _____                              |  |



Lionville Laboratory, Inc.  
PCB ANALYTICAL DATA PACKAGE FOR  
TNU-HANFORD RC-007 *K1194*



DATE RECEIVED: 04/25/08

LVL LOT# : 0804L002

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J16MM2	001	W	08LE0202	04/21/08	04/28/08	04/30/08
J16MM2	001 MS	W	08LE0202	04/21/08	04/28/08	04/30/08
J16MM2	001 MSD	W	08LE0202	04/21/08	04/28/08	04/30/08

LAB QC:

PBLKPR	MB1	W	08LE0202	N/A	04/28/08	04/30/08
PBLKPR	MB1 BS	W	08LE0202	N/A	04/28/08	04/30/08



## Case Narrative

**Client:** TNU-HANFORD RC-007  
**LVL #:** 0804L002  
**SDG/SAF #** *K11941* RC-007

**W.O. #:** 11343-606-001-9999-00  
**Date Received:** 04-25-2008

### PCB

One (1) water sample was collected on 04-21-2008.

The sample and its associated QC samples were extracted on 04-28-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 04-30-2008. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8082.

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:

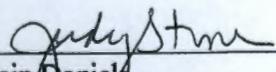
1. The sample was extracted and analyzed within required holding time
2. The sample and its associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. The matrix spike analyses are associated with LvLI lot 0804L002.
7. The initial calibrations associated with this data set were within acceptance criteria.
8. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

k:\group\data\post\0804-002kw1.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. 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

5/7/08  
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.

RFW Batch Number: 0804L002

Client: TNU-HANFORD RC-007

Work Order: 11343606001 Page: 1

Sample Information	Cust ID:	J16MM2	J16MM2	J16MM2	PBLKPR	PBLKPR BS
	RFW#:	001	001 MS	001 MSD	08LE0202-MB1	08LE0202-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate:	Tetrachloro-m-xylene	94 %	100 %	98 %	93 %	93 %
	Decachlorobiphenyl	59 %	57 %	63 %	91 %	95 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl-----						
Aroclor-1016		0.40 U	95 %	97 %	0.40 U	89 %
Aroclor-1221		0.40 U	0.57 U	0.40 U	0.40 U	0.40 U
Aroclor-1232		0.40 U	0.57 U	0.40 U	0.40 U	0.40 U
Aroclor-1242		0.40 U	0.57 U	0.40 U	0.40 U	0.40 U
Aroclor-1248		0.40 U	0.57 U	0.40 U	0.40 U	0.40 U
Aroclor-1254		0.40 U	0.57 U	0.40 U	0.40 U	0.40 U
Aroclor-1260		0.40 U	92 %	95 %	0.40 U	91 %

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

000000005

Extract. Date: 04/28/08

Extraction Batch No: 08LE0202

Analyst: MF

Method: CONT3520

Test: OPCB

Cleanup Date: 04/30/08

Analyst: MF

Client: TNU-HANFORD RC-007

LIMS Report Date: 04/30/08

Solvent: DCM,HEXANE

Adsorbent: H2SO4

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
0804L002-	TNU-HANFORD RC-007										
001	J16MM2	7	1000	1.0		10		1.0	N	0.0	10.00
001 -S	J16MM2	7	700	1.0	1.0	10		1.0	N	0.0	14.29
001 -T	J16MM2	7	1000	1.0	1.0	10		1.0	N	0.0	10.00
0804L975-	BJC BYWO02387A										
003	EMWGW2578	7	1000	1.0		10		1.0	N	0.0	10.00
008	EMWGW2626	7	1000	1.0		10		1.0	N	0.0	10.00
014	EMWGW2635	7	1000	1.0		10		1.0	N	0.0	10.00
014 -S	EMWGW2635	7	1000	1.0	1.0	10		1.0	N	0.0	10.00
014 -T	EMWGW2635	7	1000	1.0	1.0	10		1.0	N	0.0	10.00
015	EMWGW2636	7	1000	1.0		10		1.0	N	0.0	10.00
0804L977-	TNU-HANFORD RC-012										
001	J16MM3	7	1000	1.0		10		1.0	N	0.0	10.00
0804L978-	TNU-HANFORD RC007										
001	J16MM4	7	1000	1.0		10		1.0	N	0.0	10.00
0804L998-	BJC BYWO02387A										
003	EMWGW2657	7	1000	1.0		10		1.0	N	0.0	10.00
008	EMWGW2689	7	1000	1.0		10		1.0	N	0.0	10.00
013	EMWGW2673	7	1000	1.0		10		1.0	N	0.0	10.00
08LE0202-MB1	PBLKPR	7	1000	1.0		10		1.0	N	0.0	10.00
08LE0202-MB1 -S	PBLKPR	7	1000	1.0	1.0	10		1.0	N	0.0	10.00

Comments:

Surrogate: 250 UL OLM PSURR 89916406

Spike: 250 UL AR1660 89916602

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
<i>all</i>	<i>[Signature]</i>	4/30/08 1430	SZ	4/30/08 14:50	GC

000000006



**Washington Closure Hanford**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Collector  
**STRICKLAND/SHERMAN**

Project Designation  
100-N Ancillary Facilities & 190-DR ETF Analytical Data Re

Company Contact  
Amy Hood

Telephone No.  
376-9759

Project Coordinator  
KESSNER, JH

Price Code **7K**

Data Turnaround

**15 Days**

Chest No.:  
**AFS-04-053**

Field Logbook No.  
EL-1516-12

COA  
RD4MXX2F00

Method of Shipment  
Fed Ex

Shipped To  
EBERLINE SERVICES (LIONVILLE)

Offsite Property No.  
**A080241**

Bill of Lading/Air Bill No.  
See OSCP

**POSSIBLE SAMPLE HAZARDS/REMARKS**

Potential Rad

Special Handling and/or Storage

Cool to 4c

Preservation	HNO3 to pH <2	HNO3 to pH <4	None	HNO3 to pH <2	Cool 4C	Cool 4C	None	HCl to pH <2 Cool 4C
Type of Container	G/P	G/P	G/P	G/P	P	aG	G	aG
No. of Container(s)	1	1	1	1	1	4	1	3
Volume	1000mL	1000mL	60mL	500mL	500mL	1000mL	250mL	1000mL

**SAMPLE ANALYSIS**

Gross Alpha: Gross Beta

See item (1) in Special Instructions  
**TRE 4-17-08**

RCF GEA Shipping Screen

See item (2) in Special Instructions

See item (3) in Special Instructions

PCBs - 8082

Ignitability - 1010

See item (4) in Special Instructions

Sample No.	Matrix *	Sample Date	Sample Time						
18MM2	WATER	4/21/08	1035		X	X	X	X	X

**CHAIN OF POSSESSION**

**Sign/Print Names**

Received By/Removed From <i>[Signature]</i>	Date/Time 4/24/08 1130	Received By/Removed From <i>[Signature]</i>	Date/Time 4-21-08 1130
Received By/Removed From <i>[Signature]</i>	Date/Time 4-21-08 1640	Received By/Removed From <i>[Signature]</i>	Date/Time 4-21-08 1640
Received By/Removed From <i>[Signature]</i>	Date/Time 4/24/08 0930	Received By/Removed From <i>[Signature]</i>	Date/Time 4/24/08 0930
Received By/Removed From <i>[Signature]</i>	Date/Time 4-25-08 0955	Received By/Removed From <i>[Signature]</i>	Date/Time 4-25-08 0955

**SPECIAL INSTRUCTIONS**

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Antimony-125, Barium-133, Radium-226, Radium-228)

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Antimony, Beryllium, Calcium, Copper, Iron, Lithium, Magnesium, Manganese, Nickel, Potassium, Silica, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV)

(3) IC Anions - 300.0 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); pH (Water) - 9040

(4) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - diesel range); TPH-Diesel Range - WTPH-D - Add On (Total petroleum hydrocarbons - motor oil (high boiling))

Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.

**Matrix \***

B-Soil  
SB-Sediment  
SO-Solid  
SL-Sludge  
W - Water  
O-Oil  
A-Air  
DS-Drum Solids  
DL-Drum Liquids  
T-Tissue  
WI-Wipe  
L-Liquid  
V-Vegetation  
X-Other

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

0000000000

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

CLIENT: TNU HANFORD  
 Project (SAF/SOW/Release #: RC-007

Date: 4-25-06

LvLI Batch #: 08046002

Sample Custodian: [Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |  |
|---|---|--|
| 1. Samples Hand Delivered or <u>Shipped?</u>  | Carrier <u>Fed Ex</u>                   | Airbill # <u>7989 2720 3313</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 <b>Comments:</b>                                   |
| 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 cooled or ambient?  | Temp <u>2</u> °C                        | Cooler # <u>AFS-04-053</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? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No <u>PH</u> <input 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?   | <input type="checkbox"/> Yes            | <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A            |
| Person Contacted _____  | Date _____                              |  |

