0078934

SAF-RC-074
100-D/DR Burial Grounds & Remaining Sites – Soil Quick Turn
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 10/16/08
INITIAL/DATE

COMMENTS:

RECEIVED
OCT 2 2 2008
EDMC

SDG K1321 SAF RC-074

Rad only Chem only X Rad & Chem

X Complete Partial

Waste Sites: 118-D-3 in-process sampling, stained soil

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

September 15, 2008

RECEIVED
SEP 2008

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

Reference: **P.O. #S00W235A00**
Eberline Services R8-09-049-7883, SDG K1321

Dear Ms. Kessner:

Enclosed is a data report for one solid (soil) sample designated under SAF No. RC-074 received at Eberline Services on September 5, 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 Mannion

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1321 was composed of one solid (soil) sample designated under SAF No. RC-074 with a Project Designation of: 100-D/DR Burial Grounds & Remaining Site-Soil Quick Turn.

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 September 12, 2008.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analysis

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 Mannion

Melissa C. Mannion
Senior Program Manager

09/15/08

Date

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP K1321

SDG	7883
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. S00W235A00
Case no	SDG_K1321

SUMMARY DATA SECTION

TABLE OF CONTENTS

About this section	1
Sample Summaries	3
Prep Batch Summary	5
Work Summary	6
Method Blanks	7
Lab Control Samples	8
Duplicates	9
Data Sheets	10
Method Summaries	11
Report Guides	16
End of Section	30

Prepared by

Melissa Mannion

Reviewed by

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	09/12/08

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.

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

SDG 7883
:act Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1321

LE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
049-01	J17HM1	118D3 in-procStainedSoil	SOLID		RC-074	RC-074-090	09/02/08 08:30
049-02	Lab Control Sample		SOLID		RC-074		
049-03	Method Blank		SOLID		RC-074		
049-04	Duplicate (R809049-01)	118D3 in-procStainedSoil	SOLID		RC-074		09/02/08 08:30

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 09/12/08

BERLINE SERVICES/RICHMOND

SDG 7883
:act Melissa C. Mannion

SAMPLE DELIVERY GROUP K1321

QC SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1321

CH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
	RC-074-090	J17HM1	SOLID	93.4	275 g		09/05/08	3	R809049-01	7883-001
		Method Blank	SOLID						R809049-03	7883-003
		Lab Control Sample	SOLID						R809049-02	7883-002
		Duplicate (R809049-01)	SOLID	93.4	275 g		09/05/08	3	R809049-04	7883-004

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

SDG 7883
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1321

EST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
lpha Spectroscopy												
U	SOLID	Plutonium, Isotopic in Solids	6169-021	8.0	1			1	1	1/1		
eta Counting												
R	SOLID	Total Strontium in Solids	6169-021	10.4	1			1	1	1/1		
iquid Scintillation Counting												
:	SOLID	Carbon 14 in Solids	6169-021	10.0	1			1	1	1/1		
I	SOLID	Tritium in Solids	6169-021	10.0	1			1	1	1/1		
NI_L	SOLID	Nickel 63 in Solids	6169-021	11.2	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 Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

SDG 7883
:act Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1321

MPLE ECTED EIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
9-01	J17HM1			7883-001	C		09/11/08	09/12/08	BW	Carbon 14 in Solids
02/08	118D3 in-procStainedSoil		SOLID	7883-001	H		09/12/08	09/12/08	BW	Tritium in Solids
05/08	RC-074-090	RC-074		7883-001	NI_L		09/10/08	09/11/08	BW	Nickel 63 in Solids
				7883-001	PU		09/10/08	09/11/08	BW	Plutonium, Isotopic in Solids
				7883-001	SR		09/09/08	09/11/08	BW	Total Strontium in Solids
9-02	Lab Control Sample			7883-002	C		09/11/08	09/12/08	BW	Carbon 14 in Solids
			SOLID	7883-002	H		09/12/08	09/12/08	BW	Tritium in Solids
		RC-074		7883-002	NI_L		09/10/08	09/11/08	BW	Nickel 63 in Solids
				7883-002	PU		09/10/08	09/11/08	BW	Plutonium, Isotopic in Solids
				7883-002	SR		09/09/08	09/11/08	BW	Total Strontium in Solids
19-03	Method Blank			7883-003	C		09/11/08	09/12/08	BW	Carbon 14 in Solids
			SOLID	7883-003	H		09/11/08	09/12/08	BW	Tritium in Solids
		RC-074		7883-003	NI_L		09/10/08	09/11/08	BW	Nickel 63 in Solids
				7883-003	PU		09/10/08	09/11/08	BW	Plutonium, Isotopic in Solids
				7883-003	SR		09/09/08	09/11/08	BW	Total Strontium in Solids
49-04	Duplicate (R809049-01)			7883-004	C		09/11/08	09/12/08	BW	Carbon 14 in Solids
/02/08	118D3 in-procStainedSoil		SOLID	7883-004	H		09/12/08	09/12/08	BW	Tritium in Solids
/05/08		RC-074		7883-004	NI_L		09/10/08	09/11/08	BW	Nickel 63 in Solids
				7883-004	PU		09/10/08	09/11/08	BW	Plutonium, Isotopic in Solids
				7883-004	SR		09/09/08	09/11/08	BW	Total Strontium in Solids

COUNTS OF TESTS BY SAMPLE TYPE

;T	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
	RC-074	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1	4
	RC-074	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1	4
_L	RC-074	Nickel 63 in Solids	NI63_LSC	1			1	1	1	4
	RC-074	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
	RC-074	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TALS				5			5	5	5	20

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

7883-003

Method Blank

METHOD BLANK

SDG	7883	Client/Case no	Hanford SDG_K1321
Contact	Melissa C. Mannion	Contract	No. S00W235A00
Lab sample id	R809049-03	Client sample id	Method Blank
Dept sample id	7883-003	Material/Matrix	SOLID
		SAF No	RC-074

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-2.47	2.8	5.02	400	U	H
Carbon 14	14762-75-5	-0.197	2.0	3.40	50.0	U	C
Nickel 63	13981-37-8	-1.14	1.9	3.26	30.0	U	NI_L
Total Strontium	SR-RAD	0.027	0.17	0.335	1.00	U	SR
Plutonium 238	13981-16-3	0.015	0.091	0.202	1.00	U	PU
Plutonium 239/240	PU-239/240	0.045	0.060	0.115	1.00	U	PU

100D/DR BurialGrnd&RemainSite-SoilQT

QC-BLANK #67194

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

7883-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7883
Contact Melissa C. Mannion

Client/Case no Hanford SDG K1321
Contract No. S00W235A00

Lab sample id R809049-02
Dept sample id 7883-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No RC-074

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	570	14	7.72	400		H	605	24	94	84-116	80-120
Carbon 14	1740	15	3.53	50.0		C	1600	64	109	83-117	80-120
Nickel 63	249	6.2	3.18	30.0		NI_L	264	11	94	83-117	80-120
Total Strontium	10.1	0.59	0.275	1.00		SR	10.2	0.41	99	81-119	80-120
Plutonium 238	21.5	1.7	0.195	1.00		PU	25.8	1.0	83	85-115	80-120
Plutonium 239/240	25.5	1.9	0.121	1.00		PU	29.0	1.2	88	84-116	80-120

100D/DR BurialGrnd&RemainSite-SoilQT

QC-LCS #67193

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

7883-004

J17HM1

DUPLICATE

SDG	7883			Client/Case no	Hanford SDG K1321
Contact	Melissa C. Mannion			Contract	No. S00W235A00
	DUPLICATE		ORIGINAL		
ab sample id	R809049-04	Lab sample id	R809049-01	Client sample id	J17HM1
pt sample id	7883-004	Dept sample id	7883-001	Location/Matrix	118D3 in-procStainedSoil SOLID
		Received	09/05/08	Collected/Weight	09/02/08 08:30 275 g
% solids	93.4	% solids	93.4	Custody/SAF No	RC-074-090 RC-074

ALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
ritium	4.61	3.0	4.87	400	U	H	0	2.8	4.82	U	-		2.2
arbon 14	1.52	1.9	3.07	50.0	U	C	0.576	1.9	3.14	U	-		0.7
ckel 63	13.3	2.6	3.64	30.0		NI_L	14.3	2.6	3.67		7	47	0.5
otal Strontium	5.86	0.45	0.263	1.00		SR	5.58	0.43	0.242		5	27	0.5
lutonium 238	0.196	0.14	0.214	1.00	U	PU	0.258	0.16	0.198		27	142	0.6
lutonium 239/240	3.92	0.52	0.107	1.00		PU	4.04	0.56	0.124		3	33	0.3

00D/DR BurialGrnd&RemainSite-SoilQT

C-DUP#1 67195

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

7883-001 J17HM1

DATA SHEET

SDG	7883	Client/Case no	Hanford SDG_K1321
Contact	Melissa C. Mannion	Contract	No. S00W235A00
Lab sample id	R809049-01	Client sample id	J17HM1
Dept sample id	7883-001	Location/Matrix	118D3 in-procStainedSoil SOLID
Received	09/05/08	Collected/Weight	09/02/08 08:30 275 g
% solids	93.4	Custody/SAF No	RC-074-090 RC-074

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0	2.8	4.82	400	U	H
Carbon 14	14762-75-5	0.576	1.9	3.14	50.0	U	C
Nickel 63	13981-37-8	14.3	2.6	3.67	30.0		NI_L
Total Strontium	SR-RAD	5.58	0.43	0.242	1.00		SR
Plutonium 238	13981-16-3	0.258	0.16	0.198	1.00		PU
Plutonium 239/240	PU-239/240	4.04	0.56	0.124	1.00		PU

100D/DR BurialGrnd&RemainSite-SoilQT

Lab id	EBRLNE
Protocol	Hanford1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

Test PU Matrix SOLID
SDG 7883
tact Melissa C. Mannion

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1321

ULTS

ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240
ation batch 6169-021							
9-01			7883-001	J17HM1	0.258		4.04
9-02			7883-002	Lab Control Sample	LOW		ok
9-03			7883-003	Method Blank	U		U
9-04			7883-004	Duplicate (R809049-01)	ok	U	ok
l values and limits from method				RDLs (pCi/g)	1.00		1.00
R BurialGrnd&RemainSite-SoilQT							

HOD PERFORMANCE

E ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
ration batch 6169-021			2σ prep error 8.0 % Reference Lab Notebook #6169, pg. 21													
49-01			J17HM1	0.198	0.500			93		171			8	09/10/08	09/10	SS-028
49-02			Lab Control Sample	0.195	0.500			97		172				09/10/08	09/10	SS-032
49-03			Method Blank	0.202	0.500			88		172				09/10/08	09/10	SS-033
49-04			Duplicate (R809049-01)	0.214	0.500			89		171			8	09/10/08	09/10	SS-035
al values and limits from method				1.00	0.500			20-105		100	100		180			

OCEDURES	REFERENCE	PUISO_PLATE_AEA
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 3
	CP-008	Heavy Element Electroplating, rev 12

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.202 ± 0.017
YIELD 92 ± 8

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

'est SR Matrix SOLID
SDG 7883
:act Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS
BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K1321

ULTS

ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
ation batch 6169-021					
9-01			7883-001	J17HM1	5.58
9-02			7883-002	Lab Control Sample	ok
9-03			7883-003	Method Blank	U
9-04			7883-004	Duplicate (R809049-01)	ok

ıl values and limits from method RDLs (pCi/g) 1.00
)R BurialGrnd&RemainSite-SoilQT

'HOD PERFORMANCE

E ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
ration batch 6169-021			2σ prep error 10.4 % Reference Lab Notebook #6169, pg. 21													
49-01			J17HM1	0.242	1.00			98		100			7	09/09/08	09/09	GRB-203
49-02			Lab Control Sample	0.275	1.00			93		100				09/09/08	09/09	GRB-204
49-03			Method Blank	0.335	1.00			87		100				09/09/08	09/09	GRB-223
49-04			Duplicate (R809049-01)	0.263	1.00			97		100			7	09/09/08	09/09	GRB-207
ıal values and limits from method				1.00	1.00			30-105		100			180			

)CEDURES

REFERENCE	SRTOT_SEP_PRECIP_GPC
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5
SPP-062	Sample Aliquoting, rev 0
CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.279 ± 0.080
YIELD 94 ± 10

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

:est C Matrix SOLID
SDG 7883
:act Melissa C. Mannion

Client Hanford
Contract No. S00W235A00
Contract SDG K1321

ULTS

ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
ation batch 6169-021						
9-01			7883-001	J17HM1	U	
9-02			7883-002	Lab Control Sample	ok	
9-03			7883-003	Method Blank	U	
9-04			7883-004	Duplicate (R809049-01)	-	U
ıl values and limits from method				RDLs (pCi/g)	50.0	

)R BurialGrnd&RemainSite-SoilQT

'HOD PERFORMANCE

E ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
ration batch 6169-021			2σ prep error 10.0 % Reference Lab Notebook #6169, pg. 21													
49-01			J17HM1	3.14	0.446			100		50			9	09/11/08	09/11	LSC-004
49-02			Lab Control Sample	3.53	0.400			100		50				09/11/08	09/11	LSC-004
49-03			Method Blank	3.40	0.400			100		50				09/11/08	09/11	LSC-004
49-04			Duplicate (R809049-01)	3.07	0.446			100		50			9	09/11/08	09/11	LSC-004
ıal values and limits from method				50.0	0.400					10			180			

)CEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD MDA 3.28 ± 0.433
FOR 4 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test H Matrix SOLID
SDG 7883
tact Melissa C. Mannion

Client Hanford
Contract No. S00W235A00
Contract SDG K1321

ULTS

ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
ation batch 6169-021						
9-01			7883-001	J17HM1	U	
9-02			7883-002	Lab Control Sample	ok	
9-03			7883-003	Method Blank	U	
9-04			7883-004	Duplicate (R809049-01)	-	U

l values and limits from method RDLs (pCi/g) 400
R BurialGrnd&RemainSite-SoilQT

HOD PERFORMANCE

E ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
ration batch 6169-021			2σ prep error 10.0 % Reference Lab Notebook #6169, pg. 21													
49-01			J17HM1	4.82	0.446			100		50			10	09/11/08	09/12	LSC-005
49-02			Lab Control Sample	7.72	0.400			100		50				09/11/08	09/12	LSC-005
49-03			Method Blank	5.02	0.400			100		50				09/11/08	09/11	LSC-005
49-04			Duplicate (R809049-01)	4.87	0.446			100		50			10	09/11/08	09/12	LSC-005
al values and limits from method				400	0.400					25			180			

OCEDURES REFERENCE TRITIUM_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD MDA 5.61 ± 2.82
FOR 4 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
SDG 7883
tact Melissa C. Mannion

Client Hanford
Contract No. S00W235A00
Contract SDG K1321

ULTS

ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63
ation batch 6169-021					
9-01			7883-001	J17HM1	14.3
9-02			7883-002	Lab Control Sample	ok
9-03			7883-003	Method Blank	U
9-04			7883-004	Duplicate (R809049-01)	ok
l values and limits from method				RDLs (pCi/g)	30.0
R BurialGrnd&RemainSite-SoilQT					

HOD PERFORMANCE

E ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
ration batch 6169-021			2σ prep error 11.2 % Reference Lab Notebook #6169, pg. 21													
49-01			J17HM1	3.67	0.500			86		50			8	09/09/08	09/10	LSC-004
49-02			Lab Control Sample	3.18	0.500			98		50				09/09/08	09/10	LSC-004
49-03			Method Blank	3.26	0.500			96		50				09/09/08	09/10	LSC-004
49-04			Duplicate (R809049-01)	3.64	0.500			86		50			8	09/09/08	09/10	LSC-004
al values and limits from method				30.0	0.500			30-105		25			180			

OCEDURES	REFERENCE	NI63_LSC
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5
	CP-280	Nickel-63 Purification, rev 3

AVERAGES ± 2 SD	MDA	3.44	± 0.507
FOR 4 SAMPLES	YIELD	92	± 13

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/12/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1321

SDG 7883
ontact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

SDG 7883
ntact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

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.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

SDG 7883
ontact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

WORK SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

SDG 7883
ontact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

DATA SHEET

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

The following notes apply to this report:

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

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

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

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

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

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

The following qualifiers are defined by the DVD system:

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

SDG 7883
ontact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

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.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

SDG 7883
ontact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

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.

DUPLICATE

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

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

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

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

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

SDG 7883
ontact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1321

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

SDG 7883
ontact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG_K1321

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.

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/12/08

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

  MDAs are underlined if greater than the printed RDL.

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-074-090 | Page 1 of 1

Collector SEC D.W. Shea/Sub-contractor D. Ross	**Company Contact** D.W.Shea	**Telephone No.** 521-6014	**Project Coordinator** KESSNER, JH
Price Code 8T	**Data Turnaround** 7 days		
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Soil Quick Tu	**Sampling Location** 118-D-3 in-process sampling, stained soil K1321 (7883)		**SAF No.** RC-074
Ice Chest No. SML-5 SET 24 no 9/4/08	**Field Logbook No.** EL-1607-4	**COA** R118D32600	**Method of Shipment** Fed Ex — Fed Ex
Shipped To EBERLINE SERVICES / LIONVILLE	**Offsite Property No.** See OPSC A080		**Bill of Lading/Air Bill No.** See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None	None	None				
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P				
No. of Container(s)	1	1	1	1	1	1				
Volume	60mL	60mL	60mL	60mL	60mL	60mL				
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Carbon-14; Tritium - H3	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Plutonium	See item (2) in Special Instructions.				

Sample No.	Matrix *	Sample Date	Sample Time									
J17HM1	SOIL	9/2/08	0830		DWS 9/2/08	✓	✓	✓	DWS 9/2/08			

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

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Tamar R. Ross	9-2-08 0856	DWShea DWSHEA	9/2/08 0856
DWShea DWSHEA	9/2/08 1700	DWShea Fridge 1B	9/3/08 9/2/08 1700
1060/1B	9/4/08 1030	MSHankovich	9/4/08 1030
MSHankovich	9/4/08 1030	Fed Ex	

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc}
(2) RCF GEA Shipping Screen {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

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

note: samples placed into Fridge 1B on 9/2/08 @ 1700 but this fact was not noted on chain. Custody tape verified intact when seen was noticed & corrected DWShea 9/3/08

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

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

WCH-EE-011

EBERLINE

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

tk 9/05/08

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 09/05/08 09:15 CoC No. RC-074-090

Container I.D. No. SML-524 Requested TAT (Days) 7 P.O. Received Yes [ ] No [ ]

INSPECTION

1 Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]

2 Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]

3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]

4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]

5 Packing material is: Wet [ ] Dry [X]

6 Number of samples in shipping container 1 Sample Matrix S

7 Number of containers per sample: 3 (Or see CoC _____)

8. Samples are in correct container Yes [X] No [ ]

9 Paperwork agrees with samples? Yes [X] No [ ]

10 Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]

11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]

12 Samples are Preserved [ ] Not preserved [ ] pH _____ Preservative _____

13. Describe any anomalies:

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

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

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
J17HM1	<60						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100485 Calibration date 10JUL08

Form SCP-02, 07-30-07

"over 55 years of quality nuclear services"

LvLI
LIONVILLE LABORATORY INC.

RECEIVED
OCT 2008

14 October 2008

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

Subject: Analytical Data Package

Dear Ms. Kessner:

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

LvLI Batch #	0809L034
SDG #	K1321
SAF #	RC-074
Date Received	9/05/08
# Samples	1
Matrix	SOIL
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
GC Alcohols	
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
d:\k1328.doc

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J17HM1						
SILVER, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
SILVER, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
SILVER, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
ALUMINUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
ALUMINUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
ALUMINUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
ARSENIC, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
ARSENIC, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
ARSENIC, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
BORON, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
BORON, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
BORON, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
BARIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
BARIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
BARIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
BERYLLIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
BERYLLIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
BERYLLIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
BISMUTH, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
BISMUTH, TOTAL REP	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
BISMUTH, TOTAL SPIKE	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
CALCIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
CALCIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
CALCIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
CADMIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
CADMIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
CADMIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
COBALT, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
COBALT, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
COBALT, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
CHROMIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
CHROMIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
CHROMIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
COPPER, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
COPPER, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
IRON, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
IRON, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
IRON, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
MERCURY, TOTAL	001	S	08C0157	09/02/08	09/10/08	09/10/08
MERCURY, TOTAL	001 REP	S	08C0157	09/02/08	09/10/08	09/10/08
MERCURY, TOTAL	001 MS	S	08C0157	09/02/08	09/10/08	09/10/08
POTASSIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
POTASSIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
POTASSIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
LITHIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
LITHIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
LITHIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
MAGNESIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
MAGNESIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
MAGNESIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
MANGANESE, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
MANGANESE, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
MANGANESE, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
MOLYBDENUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
MOLYBDENUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
MOLYBDENUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
SODIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
SODIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
SODIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
NICKEL, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
NICKEL, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
NICKEL, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
PHOSPHORUS, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
PHOSPHORUS, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
PHOSPHORUS, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
LEAD, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
LEAD, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
LEAD, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
ANTIMONY, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
ANTIMONY, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
ANTIMONY, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
SELENIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
SELENIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
SILICON, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
SILICON, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
SILICON, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
TIN, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
TIN, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
TIN, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
STRONTIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
STRONTIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
STRONTIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
THALLIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
THALLIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
THALLIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
URANIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
URANIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
URANIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
VANADIUM, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
VANADIUM, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
VANADIUM, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08
ZINC, TOTAL	001	S	08L0331	09/02/08	09/10/08	09/12/08
ZINC, TOTAL	001 REP	S	08L0331	09/02/08	09/10/08	09/12/08
ZINC, TOTAL	001 MS	S	08L0331	09/02/08	09/10/08	09/12/08

LAB QC:

SILVER LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
SILVER, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
ALUMINUM LABORTORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
ALUMINUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
ARSENIC LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
ARSENIC, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
BORON LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
BORON, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
BARIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
BARIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
BERYLLIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
BERYLLIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BISMUTH, LCS	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
BISMUTH, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
CALCIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
CALCIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
CADMIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
CADMIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
COBALT LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
COBALT, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
CHROMIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
CHROMIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
COPPER LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
COPPER, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
IRON LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
IRON, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
MERCURY LABORATORY	LC1 BS	S	08C0157	N/A	09/10/08	09/10/08
MERCURY, TOTAL	MB1	S	08C0157	N/A	09/10/08	09/10/08
POTASSIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
POTASSIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
LITHIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
LITHIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
MAGNESIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
MAGNESIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
MANGANESE LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
MANGANESE, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
MOLYBDENUM LABORATOR	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
MOLYBDENUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
SODIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
SODIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
NICKEL LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
NICKEL, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
PHOSPHORUS LCS	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
PHOSPHORUS, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
LEAD LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
LEAD, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
ANTIMONY LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
ANTIMONY, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
SELENIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
SELENIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILICON LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
SILICON, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
TIN LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
TIN, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
STRONTIUM LCS STANDA	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
STRONTIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
THALLIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
THALLIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
URANIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
URANIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
VANADIUM LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
VANADIUM, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08
ZINC LABORATORY	LC1 BS	S	08L0331	N/A	09/10/08	09/12/08
ZINC, TOTAL	MB1	S	08L0331	N/A	09/10/08	09/12/08

LIONVILLE LABORATORY INC.

Analytical Report

Client: WC-HANFORD RC-074
LVL#: 0809L034
SDG/SAF#: K1321/RC-074

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

METALS CASE NARRATIVE

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

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

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

   The sample was run with a 3-fold dilution for ICP metals due to sample matrix.

   The sample was run on a different instrument for Phosphorous.

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

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

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

6. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a). The MB result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and the sample read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample result was reported herein "uncorrected" for the levels found in the MB.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 20 pages.

8. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon (24.2%). The sample result may be biased low. Refer to the Inorganics Laboratory Control Standards Report.

9. The matrix spike (MS) recoveries for 6 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J17HM1	Aluminum	30,000	100.2
	Calcium	30,000	93.9
	Iron	60,000	84.8
	Antimony	300	94.3
	Silicon	3,300	101.3
	Manganese	3,000	103.2

11. The duplicate analysis for 4 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/15/08
Date

alm/m09-034

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

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

: 08091034

:hing Procedure: __1310 __1311 __1312 __Other:_____

' Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

als Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
minum	✓6010B		__200.7				__99
:imony	✓6010B	__7041 [5]	__200.7	__204.2			__99
:enic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
-ium	✓6010B		__200.7				__99
yllium	✓6010B		__200.7				__99
muth	✓6010B [1]		__200.7 [1]			__1620	__99
ron	✓6010B		__200.7				__99
dmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
lcium	✓6010B		__200.7				__99
ıromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
balt	✓6010B		__200.7				__99
pper	✓6010B	__7211 [5]	__200.7	__220.2			__99
on	✓6010B		__200.7				__99
ad	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
thium	✓6010B	__7430 [4]	__200.7			__1620	__99
agnesium	✓6010B		__200.7				__99
anganese	✓6010B		__200.7				__99
ercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
olybdenum	✓6010B		__200.7				__99
ickel	✓6010B		__200.7				__99
otassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
are Earths	__6010B [1]		__200.7 [1]			__1620	__99
elenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
ilicon	✓6010B [1]		__200.7			__1620	__99
ilica	__6010B		__200.7			__1620	__99
ilver	✓6010B	__7761 [5]	__200.7	__272.2			__99
odium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
trontium	✓6010B		__200.7				__99
hallium	✓6010B	__7841 [5]	__200.7	__279.2__200.9			__99
in	✓6010B		__200.7				__99
itanium	__6010B		__200.7				__99
Jranium	✓6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

... _Phosphorous Method: 6010B

L-W000000008

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/12/08

LIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034

ORK ORDER: 60049-001-001-0001-00

AMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J17HM1	Silver, Total	0.24	u	MG/KG	0.24	3.0
		Aluminum, Total	2970		MG/KG	9.7	3.0
		Arsenic, Total	1.5		MG/KG	1.2	3.0
		Boron, Total	1.2	u	MG/KG	1.2	3.0
		Barium, Total	36.7		MG/KG	0.24	3.0
		Beryllium, Total	0.12	u	MG/KG	0.12	3.0
		Bismuth, Total	2.6		MG/KG	1.5	3.0
		Calcium, Total	3260		MG/KG	9.7	3.0
		Cadmium, Total	0.26		MG/KG	0.12	3.0
		Cobalt, Total	7.2		MG/KG	0.48	3.0
		Chromium, Total	28.1		MG/KG	0.48	3.0
		Copper, Total	12.2		MG/KG	0.48	3.0
		Iron, Total	26500		MG/KG	10.9	3.0
		Mercury, Total	0.1		MG/KG	0.01	1.0
		Potassium, Total	313		MG/KG	9.7	3.0
		Lithium, Total	2.4		MG/KG	0.1	3.0
		Magnesium, Total	3110		MG/KG	6.1	3.0
		Manganese, Total	230		MG/KG	0.1	3.0
		Molybdenum, Total	0.92		MG/KG	0.73	3.0
		Sodium, Total	204		MG/KG	4.8	3.0
		Nickel, Total	5.2		MG/KG	0.48	3.0
		Phosphorus, Total	1240		MG/KG	12.1	3.0
		Lead, Total	17.8		MG/KG	0.73	3.0
		Antimony, Total	0.73	u	MG/KG	0.73	3.0
		Selenium, Total	1.5	u	MG/KG	1.5	3.0
		Silicon, Total	155		MG/KG	9.7	3.0
		Tin, Total	1.5	u	MG/KG	1.5	3.0
		Strontium, Total	9.8		MG/KG	0.07	3.0
		Thallium, Total	1.5	u	MG/KG	1.5	3.0
		Uranium, Total	4.8	u	MG/KG	4.8	3.0
		Vanadium, Total	68.0		MG/KG	0.34	3.0
		Zinc, Total	47.3		MG/KG	1.5	3.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/12/08

CLIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034

WORK ORDER: 60049-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	08L0331-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Aluminum, Total	4.0 u	MG/KG	4.0	1.0
		Arsenic, Total	0.50 u	MG/KG	0.50	1.0
		Boron, Total	0.50 u	MG/KG	0.50	1.0
		Barium, Total	0.10 u	MG/KG	0.10	1.0
		Beryllium, Total	0.05 u	MG/KG	0.05	1.0
		Bismuth, Total	0.60 u	MG/KG	0.60	1.0
		Calcium, Total	6.0	MG/KG	4.0	1.0
		Cadmium, Total	0.05 u	MG/KG	0.05	1.0
		Cobalt, Total	0.20 u	MG/KG	0.20	1.0
		Chromium, Total	0.20 u	MG/KG	0.20	1.0
		Copper, Total	0.20 u	MG/KG	0.20	1.0
		Iron, Total	4.5 u	MG/KG	4.5	1.0
		Potassium, Total	4.0 u	MG/KG	4.0	1.0
		Lithium, Total	0.07	MG/KG	0.04	1.0
		Magnesium, Total	2.5 u	MG/KG	2.5	1.0
		Manganese, Total	0.04	MG/KG	0.04	1.0
		Molybdenum, Total	0.30 u	MG/KG	0.30	1.0
		Sodium, Total	17.9	MG/KG	2.0	1.0
		Nickel, Total	0.20 u	MG/KG	0.20	1.0
		Phosphorus, Total	5.0 u	MG/KG	5.0	1.0
		Lead, Total	0.30 u	MG/KG	0.30	1.0
		Antimony, Total	0.30 u	MG/KG	0.30	1.0
		Selenium, Total	0.60 u	MG/KG	0.60	1.0
		Silicon, Total	4.0 u	MG/KG	4.0	1.0
		Tin, Total	0.72	MG/KG	0.60	1.0
		Strontium, Total	0.03 u	MG/KG	0.03	1.0
		Thallium, Total	0.60 u	MG/KG	0.60	1.0
		Uranium, Total	2.0 u	MG/KG	2.0	1.0
		Vanadium, Total	0.14 u	MG/KG	0.14	1.0
		Zinc, Total	0.60 u	MG/KG	0.60	1.0
BLANK1	08C0157-MB1	Mercury, Total	0.01 u	MG/KG	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/12/08

CLIENT: WC-HANFORD RC-074 K1321

WORK ORDER: 60049-001-001-0001-00

LVL LOT #: 0809L034

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J17HM1	Silver, Total	3.9	0.24u	4.0	97.5	3.0
		Aluminum, Total	4460	2970	160	926.5*	3.0
		Arsenic, Total	149	1.5	160	92.0	3.0
		Boron, Total	73.7	1.2 u	80.1	92.0	3.0
		Barium, Total	194	36.7	160	97.9	3.0
		Beryllium, Total	3.5	0.12u	4.0	87.5	3.0
		Bismuth, Total	380	2.6	400	94.2	3.0
		Calcium, Total	6070	3260	2000	140.2	3.0
		Cadmium, Total	4.0	0.26	4.0	93.4	3.0
		Cobalt, Total	45.7	7.2	40.1	96.0	3.0
		Chromium, Total	47.9	28.1	16.0	123.8	3.0
		Copper, Total	31.8	12.2	20.0	98.0	3.0
		Iron, Total	28600	26500	80.1	2593 *	3.0
		Mercury, Total	0.26	0.1	0.15	108.7	1.0
		Potassium, Total	2200	313	2000	94.2	3.0
		Lithium, Total	81.8	2.4	80.1	99.1	3.0
		Magnesium, Total	5120	3110	2000	100.3	3.0
		Manganese, Total	298	230	40.1	170.6*	3.0
		Molybdenum, Total	74.8	0.92	80.1	92.2	3.0
		Sodium, Total	2170	204	2000	98.0	3.0
		Nickel, Total	43.3	5.2	40.1	95.0	3.0
		Phosphorus, Total	1700	1240	400	115.8	3.0
		Lead, Total	57.9	17.8	40.1	100	3.0
		Antimony, Total	19.9	0.73u	40.1	49.6	3.0
		Selenium, Total	127	1.5 u	160	79.2	3.0
		Silicon, Total	209	155	80.1	67.5	3.0
		Tin, Total	73.4	1.5 u	80.1	91.6	3.0
		Strontium, Total	90.3	9.8	80.1	100.5	3.0
		Thallium, Total	151	1.5 u	160	94.1	3.0
		Uranium, Total	374	4.8 u	400	93.3	3.0
		Vanadium, Total	112	68.0	40.1	109.0	3.0
		Zinc, Total	90.9	47.3	40.1	108.7	3.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/12/08

CLIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034

WORK ORDER: 60049-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J17HM1	Silver, Total	0.24u	0.23u	NC	3.0
		Aluminum, Total	2970	3540	17.3	3.0
		Arsenic, Total	1.5	1.3	14.3	3.0
		Boron, Total	1.2 u	1.1 u	NC	3.0
		Barium, Total	36.7	40.5	9.8	3.0
		Beryllium, Total	0.12u	0.11u	NC	3.0
		Bismuth, Total	2.6	1.8	36.4	3.0
		Calcium, Total	3260	3450	5.7	3.0
		Cadmium, Total	0.26	0.19	34.8	3.0
		Cobalt, Total	7.2	7.1	1.4	3.0
		Chromium, Total	28.1	30.7	8.8	3.0
		Copper, Total	12.2	13.4	9.4	3.0
		Iron, Total	26500	26200	1.2	3.0
		Mercury, Total	0.1	0.12	15.0	1.0
		Potassium, Total	313	353	12.1	3.0
		Lithium, Total	2.4	3.0	22.2	3.0
		Magnesium, Total	3110	3290	5.5	3.0
		Manganese, Total	230	236	2.6	3.0
		Molybdenum, Total	0.92	1.3	33.7	3.0
		Sodium, Total	204	233	13.2	3.0
		Nickel, Total	5.2	6.3	19.1	3.0
		Phosphorus, Total	1240	1240	0.48	3.0
		Lead, Total	17.8	17.5	1.7	3.0
		Antimony, Total	0.73u	0.68u	NC	3.0
		Selenium, Total	1.5 u	1.4 u	NC	3.0
		Silicon, Total	155	131	16.7	3.0
		Tin, Total	1.5 u	1.4 u	NC	3.0
		Strontium, Total	9.8	11.2	13.3	3.0
		Thallium, Total	1.5 u	1.4 u	NC	3.0
		Uranium, Total	4.8 u	4.5 u	NC	3.0
		Vanadium, Total	68.0	69.4	2.0	3.0
		Zinc, Total	47.3	49.7	4.9	3.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/12/08

LIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034

ORK ORDER: 60049-001-001-0001-00

AMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
CS1	08L0331-LC1	Silver, LCS	47.3	50.0	MG/KG	94.6
		Aluminum, LCS	474	500	MG/KG	94.8
		Arsenic, LCS	889	1000	MG/KG	88.9
		Boron, LCS	440	500	MG/KG	88.1
		Barium, LCS	470	500	MG/KG	94.1
		Beryllium, LCS	23.1	25.0	MG/KG	92.4
		Bismuth, LCS	460	500	MG/KG	91.9
		Calcium, LCS	2320	2500	MG/KG	93.0
		Cadmium, LCS	22.6	25.0	MG/KG	90.4
		Cobalt, LCS	231	250	MG/KG	92.3
		Chromium, LCS	46.8	50.0	MG/KG	93.6
		Copper, LCS	120	125	MG/KG	95.8
		Iron, LCS	466	500	MG/KG	93.2
		Potassium, LCS	2260	2500	MG/KG	90.3
		Lithium, LCS	500	500	MG/KG	99.9
		Magnesium, LCS	2280	2500	MG/KG	91.2
		Manganese, LCS	70.7	75.0	MG/KG	94.3
		Molybdenum, LCS	456	500	MG/KG	91.1
		Sodium, LCS	2300	2500	MG/KG	92.1
		Nickel, LCS	186	200	MG/KG	92.9
		Phosphorus, LCS	440	500	MG/KG	88.1
		Lead, LCS	229	250	MG/KG	91.6
		Antimony, LCS	270	300	MG/KG	89.9
		Selenium, LCS	866	1000	MG/KG	86.6
		Silicon, LCS	121	500	MG/KG	24.2
		Tin, LCS	454	500	MG/KG	90.9
		Strontium, LCS	472	500	MG/KG	94.4
		Thallium, LCS	924	1000	MG/KG	92.4
		Uranium, LCS	465	500	MG/KG	93.1
		Vanadium, LCS	234	250	MG/KG	93.6
		Zinc, LCS	93.4	100	MG/KG	93.4
LCS1	08C0157-LC1	Mercury, LCS	4.7	4.7	MG/KG	99.3

SAMPLE DIGESTION RECORD

SOP: L-SPI-3020 Rev. 00

Digestion Batch #: 08L0331
Date/Time Initiated: 9/10/08 1245
Date/Time Completed: 9/10/08 2030
Analyst(s): MW
Matrix: (Soil) Water Other:
Instr. Type: AA (ICP)
Parameters: HSL + B-, Bi, Li, Mo, P-, Si, Sn, Sr, U-

(Digested) / Undigested (circle one)
Balance #: B20
Balance Cal Verif: (Y) NA
Hot Plate Temp: 92°

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)
CLP ILMO3.0, ILMO4.0
Other tyfler

TNW

COC Batch #	Spike Vol(s) (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/So/TC	Texture	Color/Appearance	Artifact	Turb
0809L034-001		1.30 gm	100 ml	<2	TO	coarse	dk. brown mud	rocks	RAD
001R		1.39 gm	↓	↓	↓	↓	↓	↓	↓
001S	1.0 ml *	1.31 gm	↓	↓	↓	↓	↓	↓	↓
0809L053-001		1.27 gm	↓	↓	↓	↓	brown soil	↓	↓
001R		1.22 gm	↓	↓	↓	↓	↓	↓	↓
001S	1.0 ml *	1.28 gm	↓	↓	↓	↓	↓	↓	↓
002		1.25 gm	↓	↓	↓	↓	↓	↓	↓
003		1.26 gm	↓	↓	↓	↓	↓	↓	↓
08L0331-MB1		1.0 gm	↓	↓	↓	↓	boiling chips		
LC1	1.0 ml *	1.0 gm	↓	↓	↓	↓	↓		

MW 9/10/08

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

Reagent IDs:
HNO_3 G07057
HCL G15040
H_2O_2 G15A18
1:1 HNO_3 9789-083-08
1:1 HCL

File ID#: IC033101
LIMS Transfer: (Y) N updated
Data Review By/Date: RMR, 09/11/08

* also 0.5 ml 6072-076-11 (Bi)
0.5 ml 6072-079-14 (P-)
0.5 ml 6072-078-01 (U-)

Lionville Laboratory
Incorporated

MERCURY PREPARATION

Logbook # 498

Analyst: TEB
Date 9/10/08
Start Time/Temp: 1005 / 92°
End Time/Temp: 1035 / 92°

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

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

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

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

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
Blank	500			10mL	50mL	
0.2 µg/L	3VG	0.100				
1.0	PC	0.500				
2.0	Gd	1.000				
5.0	R	2.500				
10.0	11A	5.000				
ICV	H3	0.125	2.5			
CCV	8	0.250	5.0			
ICB/CCB	PA/NJ					9.80L
MB1	JC			0.30		PBS157 100.0
LCS	NR	*	*	0.30		LCSS157
0809L034-001	1721			0.33		R 95.35
001R	K17			0.38		
001S	6J	0.500	1.0	0.35		
0809L006-001	L15			0.33		100.00
001R	NB			0.39		
001S	E7	0.500	1.0	0.33		
0809L021-001	31			0.41		99.98
002	537			0.31		96.97
002R	N2			0.35		
002S	KX	0.500	1.0	0.31		
003	P3			0.31		96.99
004	CM			0.31		92.34
0809L022-001	S14			0.31		99.97
002	AP			0.32		98.08
002R	114			0.36		
002S	816	0.500	1.0	0.32		

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

Reviewed By/Date: [signature] 9/12/08

see book # 9368 for std traceability information

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

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

ME-HgCVAA-Prep1007

Page #:

000000016

ionville Laboratory
ncorporated

MERCURY PREPARATION

Logbook # 498

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

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

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

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

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

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
0809L022-003	P1			0.35	50mL	98.07
0809L035-001	40			0.31	↓	78.28
W1R	L53			0.32	↓	↓
W1S	UT	0.500	1.0	0.31	↓	↓
002	205			0.35	↓	82.56
0809L036-001	DX			0.36	↓	98.31
W1R	H2			0.32	↓	↓
W1S	41	0.500	1.0	0.37	↓	↓
002	RU			0.31	↓	97.75
W3	194			0.41	↓	99.95

EA 9/10/08

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

Reviewed By/Date: [signature] 9/12/08

see book # 9368 for std traceability information

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

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

ME-HgCVAA-Prep1007

Page #:

000000017

nville Laboratory Use Only

)809L034

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

nt Washington Closure Hanford RC-074

Final Proj. Sampling Date

ect# 60049-001-001-0001

ect Contact/Phone#

nville Laboratory Project Manager Dilotte Johnson

8W846 Del 8-7 TAT 7 days

e Rec'd 9.5.08 Date Due 9-12-08

		A		B									
Refrigerator #		3		3									
#/Type Container	Liquid												
	Solid	1gl		1gl									
Volume	Solid	60		60									
Preservatives													
ANALYSES REQUESTED →	ORGANIC: VOA												
	ORGANIC: BNA												
	ORGANIC: Pest/PCB												
	ORGANIC: Herb												
	INORG: Metal + Hg	CT		CT									
	INORG: CN												
Lionville Laboratory Use Only		METD		ICP6									

RIX ES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP, Leachate, Wipe, Other, Fish	001	J17HM1	✓	✓	S	9.2.08	0830							X		X				

cial Instructions:

TD = HSL + B-, Bi, Li, Mo, P, Si, Sn, Sr, U-

Special Instructions:

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

elinquished by	Received by	Date	Time
eDEx	D Smith	9.5.08	0950

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
	ORIGINAL REWRITTEN		

COMPOSITE WASTE

000000018

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-074-090 | Page 1 of 1

llector SEC D.W. Shea/Sub-contractor D. Ross	Company Contact D.W.Shea	Telephone No. 521-6014	Project Coordinator KESSNER, JH
Price Code 8J	Data Turnaround 7 days		
ɔject Designation 100-D/DR Burial Grounds & Remaining Sites - Soil Quick Tu	Sampling Location 118-D-3 in-process sampling, stained soil		SAF No. RC-074
Chest No. AFS-04-054	Field Logbook No. EL-1607-4	COA R118D32600	Method of Shipment Fed Ex
ipped To EBERLINE SERVICES/LIONVILLE	Offsite Property No. See OPSC A080345		Bill of Lading/Air Bill No. SCC OSPC

OSSIBLE SAMPLE HAZARDS/REMARKS

otentially radioactive

pecial Handling and/or Storage

Preservation	None	Cool 4C	None	None	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	60mL	60mL	60mL	60mL	60mL	60mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Carbon-14; Tritium - H3	Nickel-63; Strontium-89,90 – Total Sr	Isotopic Plutonium	See item (2) in Special Instructions.					
Sample No. / Matrix * / Sample Date / Sample Time											
7HM1 / SOIL / 9/2/08 / 0830	✓	✓		DWSHEA 9/2/08							

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
nquished By/Removed From [signature] Date/Time 9-2-08 0854	Received By/Stored In DWShea DWSHEA 9/2/08 Date/Time 0854	(1) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc} and Hg via CVAA
nquished By/Removed From DWS 9/3/08 DWSHEA 9/2/08 1700	Received By/Stored In DWShea 9/3/08 Fridge 1B Date/Time 9/2/08 1700	(2) RCF GEA Shipping Screen {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}
nquished By/Removed From 60/1B Date/Time 1015 SEP 04 2008	Received By/Stored In MStankovich SEP 04 2008 Date/Time 1015	Sampler unavailable to remove samples from controlled storage. Shipper removed samples from storage location taking custody of samples for shipment to lab.
nquished By/Removed From MStankovich Date/Time 1015 SEP 04 2008	Received By/Stored In Fed Ex Date/Time	note: samples placed into Fridge 1B on 9/2/08 @ 1700 but this fact was not noted on chain. Custody tape verified intact when seen noticed & corrected DWS 9/3/08
nquished By/Removed From Fed Ex Date/Time 9.5.08/0950	Received By/Stored In [signature] 9.5.08/0950 Date/Time	
nquished By/Removed From Date/Time	Received By/Stored In Date/Time	

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

ABORATORY SECTION	Received By	Title	Date/Time
NAL SAMPLE ISPOSITION	Disposal Method	Disposed By	Date/Time

000000019

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hamford

Project/SAF/SOW/Release #: RC-074

Date: 9.5.08

LvLI Batch #: OP09L034

Sample Custodian: D. Smith

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 798005761115
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 2.2 °C		Cooler # AFS-04-054
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvLI) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A
Person Contacted _____		Date _____	

LvLI

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-074 K1321

DATE RECEIVED: 09/05/08 LVL LOT # :0809L034

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J17HM1						
% SOLIDS	001	S	08L%S073	09/02/08	09/08/08	09/09/08
% SOLIDS	001 REP	S	08L%S073	09/02/08	09/08/08	09/09/08
CHROMIUM VI	001	S	08LVI062	09/02/08	09/10/08	09/10/08
CHROMIUM VI	001 REP	S	08LVI062	09/02/08	09/10/08	09/10/08
CHROMIUM VI	001 MS	S	08LVI062	09/02/08	09/10/08	09/10/08
CHROMIUM VI	001 MSD	S	08LVI062	09/02/08	09/10/08	09/10/08
B QC:						
CHROMIUM VI	MB1	S	08LVI062	N/A	09/10/08	09/10/08
CHROMIUM VI	MB1 BS	S	08LVI062	N/A	09/10/08	09/10/08
CHROMIUM VI	MB1 BSD	S	08LVI062	N/A	09/10/08	09/10/08

LIONVILLE LABORATORY INC.

Analytical Report

Client: WC-HANFORD RC-074 K1321
LVL#: 0809L034

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

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

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

3. Sample holding times as required by the method and/or contract were met.

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

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

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

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

10/3/08
Date

njp\i09-034

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 11 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: **Method:**

Other: **Method**

L-WI-034/B-01/01

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.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/08

LIENT: WC-HANFORD RC-074 K1321

LVL LOT #: 0809L034

ORK ORDER: 60049-001-001-0001-00

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
001	J17HM1	% Solids	95.3	%	0.01	1.0
		Chromium VI	2.8	MG/KG	0.21	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/26/08

:LIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034

'ORK ORDER: 60049-001-001-0001-00

:AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
:LANK10	08LVI062-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/26/08

CLIENT: WC-HANFORD RC-074 K1321

LVL LOT #: 0809L034

WORK ORDER: 60049-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J17HM1	Soluble Chromium VI	7.4	2.8	4.2	107.9	1.0
		Insoluble Chromium VI	1430	2.8	1160	122.6	100
BLANK10	08LVI062-MB1	Soluble Chromium VI	4.2	0.20u	4.0	104.9	1.0
		Insoluble Chromium VI	1070	0.20u	1150	93.0	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/26/08

LIENT: WC-HANFORD RC-074 K1321 LVL LOT #: 0809L034
ORK ORDER: 60049-001-001-0001-00

AMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
001REP	J17HM1	% Solids	95.3	94.7	0.59	1.0
		Chromium VI	2.8	2.8	2.0	1.0

nville Laboratory Use Only
)809L034

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

nt Washington Closure Hanford RC-074
Final Proj. Sampling Date
ect# 60049-001-001-0001
ect Contact/Phone#
ville Laboratory Project Manager Arlitta Johnson
8W846 Del 8-7 TAT 7 days
Rec'd 9.5.08 Date Due 9-12-08

		A	B
Refrigerator #		3	3
#/Type Container	Liquid / Solid	1gl	1gl
Volume	Solid	60	60
Preservatives		—	Cr+6
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb		
	INORG: Metal + Hg, CN	METO	ICP6

RIX ES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only													
Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP, Leachate, Wipe, Other, Fish	001	J17HM1	✓	✓	S	9.2.08	0830								X		X				

cial Instructions:
① = HSL + B⁻, Bi, Li, Mo, P, Si, Sn, Sr, U⁻

Special Instructions:
1.
2.
3.
4.
5.
6.

elinquished by	Received by	Date	Time
FedEx	SSmith	9.5.08	0950

Relinquished by	Received by	Date	Time

Relinquished by	Received	Date	Time
	ORIGINAL REWRITTEN		

"COMPOSITE WASTE"

000000009

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-074-090 | Page 1 of 1

llector: SEC D.W. Shea/Sub-contractor: D. Rios	Company Contact: D.W.Shea Telephone No.: 521-6014	Project Coordinator: KESSNER, JH	Price Code: 8J Data Turnaround: 7 days
ıject Designation: 100-D/DR Burial Grounds & Remaining Sites - Soil Quick Tu	Sampling Location: 118-D-3 in-process sampling, stained soil	SAF No.: RC-074	
Chest No.: AFS-04-054	Field Logbook No.: EL-1607-4 COA: R118D32600	Method of Shipment: Fed Ex	
ipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A080345 See OPSC	Bill of Lading/Air Bill No.: SCC OSPC	

OSSIBLE SAMPLE HAZARDS/REMARKS

ıtentially radioactive

ıecial Handling and/or Storage

Preservation	None	Cool 4C	None	None	None	None					
Type of Container	G/P	G/P	G/P	G/P	G/P	G/P					
No. of Container(s)	1	1	1	1	1	1					
Volume	60mL	60mL	60mL	60mL	60mL	60mL					
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196	Carbon-14; Tritium - H3	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Plutonium	See item (2) in Special Instructions.					
Sample No.	Matrix *	Sample Date	Sample Time								
7HM1	SOIL	9/2/08	0830	✓	✓		DWShea 9/2/08				

CHAIN OF POSSESSION	Sign/Print Names		
ıquished By/Removed From	Date/Time 9-2-08 BSL	Received By/Stored In DWShea DWSHEA	Date/Time 9/2/08 0855
ıquished By/Removed From DWS DWSHEA	Date/Time 9/2/08 1700	Received By/Stored In DWShea DWSHEA	Date/Time 9/3/08 9/2/08 1700
ıquished By/Removed From 60/1B	Date/Time 1015 SEP 04 2008	Received By/Stored In MStankovich	Date/Time 1015 SEP 04 2008
ıquished By/Removed From MStankovich	Date/Time 1015 SEP 04 2008	Received By/Stored In Fed Ex	Date/Time
ıquished By/Removed From Fed Ex	Date/Time 9.5.08/0950	Received By/Stored In	Date/Time 9.5.08/0950
ıquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010 (Full List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc} and Hg via CVAA
(2) RCF GEA Shipping Screen {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

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

note: samples placed into Fridge 1B on 9/2/08 @ 1700 but this fact was not noted on chain. Custody was verified intact when sent noted & corrected DWS 9/3/08

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

.BORATORY SECTION	Received By	Title	Date/Time
NAL SAMPLE ISPOSITION	Disposal Method	Disposed By	Date/Time

VW

000000010.

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hamford Date: 9.5.08

Project/SAF/SOW/Release #: RC.074

LvLI Batch #: OP09L034 Sample Custodian: D. Smith

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier Fed Ex		Airbill # 798005761112
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 2.2 °C		Cooler # AFS-04-054
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify):
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvLI) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no, then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☑ Yes	☐ No	☐ N/A
15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A
Person Contacted _____		Date _____	

LvLI