

# River Corridor Closure Contract

---

## Annual Report for Gravity Collection Lysimeter Monitoring Plan – ERDF Cells 5 and 6

March 2006

**Washington Closure Hanford**

Prepared for the U.S. Department of Energy, Richland Operations Office  
Office of Assistant Manager for River Corridor



**TRADEMARK DISCLAIMER**

---

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

---

This report has been reproduced from the best available copy. Available in paper copy and microfiche.

Available for a processing fee to U.S. Department of Energy and its contractors from:  
U.S. Department of Energy  
Office of Scientific and Technical Information  
P.O. Box 62  
Oak Ridge, TN 37831-0062  
(865) 576-8401  
fax: (865) 576-5728  
email: [reports@adonis.osti.gov](mailto:reports@adonis.osti.gov)  
online ordering: <http://www.doe.gov/bridge>

Available for sale to the public, in paper, from:  
U.S. Department of Commerce  
National Technical Information Service  
5285 Port Royal Road  
Springfield, VA 22161  
(800) 553-6847  
fax: (703) 605.6900  
email: [orders@ntis.fedworld.gov](mailto:orders@ntis.fedworld.gov)  
online ordering: <http://www.ntis.gov/ordering.htm>

Printed in the United States of America

DISCLM-5.CHP (11/99)

WCH-R & DC mjp 04/04/06

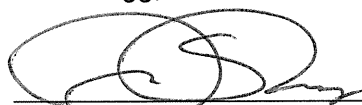
WCH-42  
Rev. 0  
OU: N/A  
TSD: N/A  
ERA: N/A

**STANDARD APPROVAL PAGE**

**Title:** Annual Report for Gravity Collection Lysimeter Monitoring Plan –  
ERDF Cells 5 and 6

**Author Name:** M. L. Proctor

**Approval:** J. E. Rugg, Environmental Lead

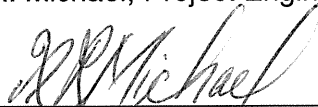


Signature

4/03/06

Date

A. R. Michael, Project Engineer, Waste Operations Project



Signature

4/3/06

Date

*The approval signatures on this page indicate that this document has been authorized for information release to the public through appropriate channels. No other forms or signatures are required to document this information release.*



**River Corridor  
Closure Contract** 

---

**Annual Report for Gravity  
Collection Lysimeter Monitoring  
Plan – ERDF Cells 5 and 6**

**March 2006**

Author:

**M. L. Proctor**

**Washington Closure Hanford**

Prepared for the U.S. Department of Energy, Richland Operations Office  
Office of Assistant Manager for River Corridor





## TABLE OF CONTENTS

1.0	PURPOSE AND SCOPE .....	1
2.0	MONITORING AND SAMPLING.....	1
3.0	DEWATERING .....	1

### APPENDIX

A	SAF-B05-039 ERDF LYSIMETER SAMPLING FINAL DATA PACKAGE.....	A-i
---	---	-----





## 1.0 PURPOSE AND SCOPE

This report has been prepared in accordance with the *Gravity Collection Lysimeter Monitoring Plan – ERDF Cells 5 and 6* (Monitoring Plan), dated March 30, 2005. As identified in Section 4 of the Monitoring Plan, the objectives of the annual report are to:

- Describe changes in the volume of liquid seen in each lysimeter (if any).
- Describe concentrations and changes or trends in the concentrations of leachate-indicator constituents in any liquids accumulated in each lysimeter.
- Summarize the finding in regard to the presence or absence of leachate in each lysimeter.
- Make recommendations, if any, limited to vadose-zone study-related variables.

The data and analyses contained in this report reflect the initial characterization of construction and consolidation water in Cells 5 and 6 lysimeters. Therefore, the scope of this report will be to establish constituent levels and document dewatering activities completed to date.

## 2.0 MONITORING AND SAMPLING

Initial sampling and analysis efforts on lysimeters in Cells 5 and 6 at ERDF took place August 23, 24, and 25, 2005. The samples were analyzed for the following four constituents:

- Chloride
- Gross Alpha
- Technicium 99
- Gross Beta.

The analysis (included as Appendix A) was conducted in order to establish a baseline representative of the construction and consolidation water present in the lysimeters. If water is discovered during future monitoring activities (after dewatering is complete) a representative sample will be taken, analyzed for the constituents identified above, and compared to the initial baseline.

## 3.0 DEWATERING

The Monitoring Plan recommends the lysimeters be dewatered. The Monitoring Plan also recognizes the fact that the construction water will fully draw down and come to equilibrium very slowly due to the fairly low hydraulic conductivity of the backfill, especially near the bottom of the prism and because of the very low head that will be driving the last volumes of construction water. Because of these conditions, recharge is occurring at an unknown rate and full drying of the lysimeters will not occur until full equilibrium is reached. Therefore, dewatering of the

lysimeters at Cells 5 and 6 will occur over time through a series of pumping activities, anticipated to take place in the spring and fall of each year. Once it is determined that all water that can be removed via pumping has occurred, a follow on drying activity will take place with rags or some other innovative means to fully dry the lysimeters.

The initial dewatering effort was met with a number of challenges. The cold weather made pumping activities difficult due to freezing of water transport lines and compressor equipment. In addition, the weather lead to technical difficulties with the pump, leading to unanticipated stops. Lastly, it was determined that the amount of water contained within the lysimeters was a great deal more than first estimated.

The initial dewatering effort for the Cell 6 lysimeter began December 6, 2005, and ended on December 20, 2005. A total of 2,302 gal were removed from the Cell 6 lysimeter. Dewatering of Cell 5 lysimeter began January 4, 2006, and ended January 5, 2006. A total of 1,651 gal were removed from the Cell 5 lysimeter.

It is anticipated that the next dewatering round for both Cells 5 and 6 will begin summer 2006. The Monitoring Plan states that routine lysimeter inspections and sampling of any wet lysimeters be conducted semi-annually for the first two years and then annually thereafter. Due to the ongoing dewatering efforts planned, the semi-annual/annual sampling efforts will not begin until all dewatering series are completed.

**APPENDIX A**

**SAF-B05-039**

**ERDF LYSIMETER SAMPLING**

**FINAL DATA PACKAGE**





October 7, 2005

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3190 George Washington Way  
MSIN H9-02  
Richland, WA 99352

Reference: **P.O. #630**  
**Eberline Services R5-08-231-7300, SDG H3340**

Dear Ms. Kessner:

Enclosed is a data report for one water sample designated under SAF No. B05-039 received at Eberline Services on August 29, 2005. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/

Enclosure: Data Package

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

Eberline Services  
W.O. No. R5-08-231-7300

Bechtel Hanford Inc.  
SDG H3340

Case Narrative

Page 1 of 1

## 1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3340 was composed of one water sample designated under SAF No. B05-039 with a Project Designation of: ERDF Lysimeter Sampling.

Equal parts (by weight) of sample J03X89 (water) and J03X90 (soil) were thoroughly mixed together for four hours. The slurry was then filtered using 0.45-micron filters and then analyzed for gross alpha/beta and Tc-99. The filtered slurry sample was called J03X89.

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 BHI via e-mail on October 5, 2005.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

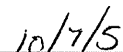
### 2.2 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

### Case Narrative Certification Statement

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

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

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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

T A B L E   O F   C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	11
Report Guides	.	.	.	14
End of Section	.	.	.	28

Melissa Mannion  
Prepared by  
Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05



EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES  
Page 2  
SUMMARY DATA SECTION  
Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R508231-01	J03X89	ERDF Add-Mix/Raw Water	WATER		B05-039	B05-039-2	05/25/05 10:45
R508231-02	Lab Control Sample		WATER		B05-039		
R508231-03	Method Blank		WATER		B05-039		
R508231-04	Duplicate (R508231-01)	ERDF Add-Mix/Raw Water	WATER		B05-039		05/25/05 10:45

LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7300	B05-039-2	J03X89	WATER		0.98 L		08/29/05 96	R508231-01	7300-001
		Method Blank	WATER					R508231-03	7300-003
		Lab Control Sample	WATER					R508231-02	7300-002
		Duplicate (R508231-01)	WATER		0.98 L		08/29/05 96	R508231-04	7300-004

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-QS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED					QUALI- FIERS
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	
Beta Counting										
TC	WATER	Technetium 99 in Water	7136-100	10.0	1			1	1	1/1
Gas Proportional Counting										
93A	WATER	Gross Alpha in Water	7136-100	20.0	1			1	1	1/1
93B	WATER	Gross Beta in Water	7136-100	15.0	1			1	1	1/1

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

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-PBS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB SAMPLE	CLIENT SAMPLE ID	COLLECTED	LOCATION	MATRIX	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD
RECEIVED	CUSTODY	SAF No					FIX				
R508231-01	J03X89				7300-001	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water
05/25/05	ERDF Add-Mix/Raw Water			WATER	7300-001	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water
08/29/05	B05-039-2	B05-039			7300-001	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water
R508231-02	Lab Control Sample				7300-002	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water
				WATER	7300-002	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water
		B05-039			7300-002	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water
R508231-03	Method Blank				7300-003	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water
				WATER	7300-003	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water
		B05-039			7300-003	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water
R508231-04	Duplicate (R508231-01)				7300-004	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water
05/25/05	ERDF Add-Mix/Raw Water			WATER	7300-004	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water
08/29/05		B05-039			7300-004	TC		09/20/05	09/28/05	MWT	Technetium 99 in Water

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	B05-039	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
93B/93	B05-039	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1		4
TC	B05-039	Technetium 99 in Water	TC99_TR_SEP_LSC	1			1	1	1		4
TOTALS				3			3	3	3		12

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LWS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7300-003

Method Blank

METHOD BLANK

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508231-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7300-003</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B05-039</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.163	0.59	1.4	3.0	U	93A
Gross Beta	12587-47-2	0.638	1.1	1.9	4.0	U	93B
Technetium 99	14133-76-7	<u>-1.64</u>	1.4	5.4	15	U	TC

ERDF Lysimeter Sampling

QC-BLANK 54349
----------------

METHOD BLANKS  
Page 1  
SUMMARY DATA SECTION  
Page 7

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

7300-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508231-02</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7300-002</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B05-039</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMES (TOTAL)	PROTOCOL LIMITS
Gross Alpha	27.1	3.6	1.3	3.0	93A	34.0	1.4	80	71-129	70-130
Gross Beta	35.1	2.6	2.0	4.0	93B	33.1	1.3	106	73-127	80-120
Technetium 99	1070	71	5.9	15	TC	1090	44	98	81-119	80-120

ERDF Lysimeter Sampling

QC-LCS 54348

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 8

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

7300-004

J03X89

DUPLICATE

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R508231-04</u>	Lab sample id <u>R508231-01</u>	Client sample id <u>J03X89</u>
Dept sample id <u>7300-004</u>	Dept sample id <u>7300-001</u>	Location/Matrix <u>ERDF Add-Mix/Raw Water</u> <u>WATER</u>
	Received <u>08/29/05</u>	Collected/Volume <u>05/25/05 10:45</u> <u>0.98 L</u>
		Custody/SAF No <u>B05-039-2</u> <u>B05-039</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TSST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT LIMIT	PROT
Gross Alpha	0.086	1.3	2.8	3.0	U	93A	2.12	1.6	1.8		184	286	
Gross Beta	5.12	1.4	2.0	4.0		93B	4.87	1.5	2.0		5	69	
Technetium 99	1.45	2.2	4.7	15	U	TC	-0.607	1.4	3.9	U	-		

ERDF Lysimeter Sampling

QC-DUP#1 54350

Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>



EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7300-001

J03X89

DATA SHEET

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508231-01</u>	Client sample id <u>J03X89</u>	
Dept sample id <u>7300-001</u>	Location/Matrix <u>ERDF Add-Mix/Raw Water</u>	<u>WATER</u>
Received <u>08/29/05</u>	Collected/Volume <u>05/25/05 10:45</u>	<u>0.98 L</u>
	Custody/SAF No <u>B05-039-2</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	2.12	1.6	1.8	3.0		93A
Gross Beta	12587-47-2	4.87	1.5	2.0	4.0		93B
Technetium 99	14133-76-7	-0.607	1.4	3.9	15	U	TC

ERDF Lysimeter Sampling

DATA SHEETS  
Page 1  
SUMMARY DATA SECTION  
Page 10

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test TC Matrix WATER  
SDG 7300  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN WATER  
BETA COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB	RAW	SUF-			Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		99
Preparation batch 7136-100					
R508231-01		7300-001	J03X89		U
R508231-02		7300-002	LCS (QC ID=54348)		ok
R508231-03		7300-003	BLK (QC ID=54349)		U
R508231-04		7300-004	Duplicate (R508231-01)		- U

Nominal values and limits from method RDLs (pCi/L) 15  
ERDF Lysimeter Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7136-100 2σ prep error 10.0 % Reference Lab Notebook 7136 pg. 100															
R508231-01		J03X89	3.9	0.100			95		100			117	09/13/05	09/19	GRB-204
R508231-02		LCS (QC ID=54348)	5.9	0.100			91		50				09/13/05	09/19	GRB-201
R508231-03		BLK (QC ID=54349)	5.4	0.100			95		50				09/13/05	09/19	GRB-202
R508231-04		Duplicate (R508231-01) (QC ID=54350)	4.7	0.100			94		66			118	09/13/05	09/20	GRB-221

Nominal values and limits from method 15 0.100 20-105 50 180

PROCEDURES REFERENCE TC99\_TR\_SEP\_LSC  
CP-431 Technetium-99 Purification of Soil or Resin by  
Extraction Chromatography, rev 2  
CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 5.0 ± 1.7  
FOR 4 SAMPLES YIELD 94 ± 4

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test 93A Matrix WATER  
SDG 7300  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN WATER  
GAS PROPORTIONAL COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB RAW SUF-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Alpha

Preparation batch 7136-100

R508231-01	93	7300-001	J03X89	2.12
R508231-02	93	7300-002	LCS (QC ID=54348)	ok
R508231-03	93	7300-003	BLK (QC ID=54349)	U
R508231-04	93	7300-004	Duplicate (R508231-01)	ok U

Nominal values and limits from method RDLs (pCi/L) 3.0

ERDF Lysimeter Sampling

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- RESID EFF COUNT FWHM DRIFT DAYS ANAL-  
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/L L FAC TION mg % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7136-100 2σ prep error 20.0 % Reference Lab Notebook 7136 pg. 100

R508231-01	93	J03X89	1.8	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-216
R508231-02	93	LCS (QC ID=54348)	1.3	0.300	60	100		09/27/05	09/27	GRB-105
R508231-03	93	BLK (QC ID=54349)	1.4	0.300	58	100		09/27/05	09/27	GRB-210
R508231-04	93	Duplicate (R508231-01) (QC ID=54350)	2.8	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-211

Nominal values and limits from method 3.0 0.300 5-250 100 180

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

AVERAGES ± 2 SD MDA 1.8 ± 1.4  
FOR 4 SAMPLES RESIDUE 104 ± 105

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test 93B Matrix WATER  
SDG 7300  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS BETA IN WATER  
GAS PROPORTIONAL COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB RAW SUP-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Beta

Preparation batch 7136-100

R508231-01	93		7300-001	J03X89	4.87
R508231-02	93		7300-002	LCS (QC ID=54348)	ok
R508231-03	93		7300-003	BLK (QC ID=54349)	U
R508231-04	93		7300-004	Duplicate (R508231-01)	ok

Nominal values and limits from method RDLs (pCi/L) 4.0  
ERDF Lysimeter Sampling

METHOD PERFORMANCE

LAB RAW SUP- MDA ALIQ PREP DILU- RESID EFF COUNT FWHM DRIFT DAYS ANAL-  
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/L L FAC TION mg % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7136-100 2σ prep error 15.0 % Reference Lab Notebook 7136 pg. 100

R508231-01	93		J03X89	2.0	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-216
R508231-02	93		LCS (QC ID=54348)	2.0	0.300	60	100		09/27/05	09/27	GRB-105
R508231-03	93		BLK (QC ID=54349)	1.9	0.300	58	100		09/27/05	09/27	GRB-210
R508231-04	93		Duplicate (R508231-01) (QC ID=54350)	2.0	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-211

Nominal values and limits from method 4.0 0.300 5-250 100 180

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

AVERAGES ± 2 SD MDA 2.0 ± 0.10  
FOR 4 SAMPLES RESIDUE 104 ± 105

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 14

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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 Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

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.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 16

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

R E P O R T   G U I D E

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

D A T A   S H E E T

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES  
Page 4  
SUMMARY DATA SECTION  
Page 17

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05



EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

DATA SHEET

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

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

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

The following values are underlined to indicate possible problems:

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

REPORT GUIDES

Page 5

SUMMARY DATA SECTION

Page 18

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

DATA SHEET

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

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 19

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.  
  
If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 20

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 21

Lab id EBRINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 630  
Case no SDG H3340

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.

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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 Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

R E P O R T   G U I D E

Client Hanford  
Contract No. 630  
Case no SDG H3340

M E T H O D   S U M M A R Y

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

The following notes apply to this report:

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

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

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

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

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

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

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

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05



EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

METHOD SUMMARY

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
  - \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- \* Aliquots are underlined if less than the nominal value specified for the method.
  - \* Preparation factors are underlined if greater than the nominal value specified for the method.
  - \* Dilution factors are underlined if greater than the nominal value specified for the method.
  - \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
  - \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
  - \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 26

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

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

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

METHOD SUMMARY

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

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

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

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

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 28


Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05



"Weiss, Richard L"  
<richard.weiss@wch-rcc.com  
>  
09/01/2005 07:30 AM

To "mmannion@eberlineservices.com"  
<mmannion@eberlineservices.com>  
cc "Kessner, Joan H" <joan.kessner@wch-rcc.com>  
bcc

Subject "Mud Pie" Sample

History:  This message has been forwarded.

Melissa,

This applies to samples J03X89 and J03X90 on SAF B05-039.

I did get information from the project, but we cannot match the true "field" conditions. The field specification is for 20% moisture and that would not yield any usable liquid for testing.

So, the following is based on the typical protocols for determining things like pH and soluble ions in soil samples.

Perform the contact using a 1:1 liquid/solid ratio based on weight. If you can get this mixture to stir using a beaker and stir-bar, do that for 1 hour. If the beaker method doesn't work, mix the liquid and solid in a jar, shake and continue shaking to thoroughly a couple times an hour for 4 hours. Then separate the liquid from the solid (any process is acceptable) and analyze the liquid. Use sample number J03X89 for the analysis results. Please remember that you need to ship a least 100ml off to Lionville for chloride analysis.

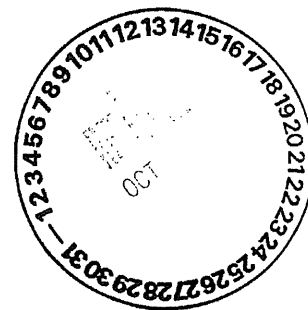
If any of this doesn't make sense, let me know.

Rich Weiss  
509-372-9631

Also, did you need my input on something else?

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-2		Page 1 of 1	
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code	
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF ADD-MIX/RAW WATER		H3340 (7299)		SAF No. B05-039		Data Turnaround 45 Days	
Ice Chest No. AF304 029		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX		Air Quality <input type="checkbox"/>	
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A050 402		Bill of Lading/Air Bill No. SEE OSFC					
POSSIBLE SAMPLE HAZARDS/REMARKS NONE				Preservation		None		None	
Special Handling and/or Storage NONE				Type of Container		G/P		P	
				No. of Container(s)		2		1	
				Volume		1000mL		500mL	
SAMPLE ANALYSIS				Gross Alpha; Gross Beta; Technetium-99		IC Anions - 300.0 (Chloride)			
Sample No.		Matrix *	Sample Date	Sample Time					
J03X88		WATER	8-25-05	1045	X1	6/8 8:50J			
J03X90		Soil	8-25-05	1050	X2				
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS CONTACT JOAN KESSNER UPON RECEIPT			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix *	
S. GALE		08/25/05 1330		FED EX				S=Soil; SE=Soilment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trasue Wl=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		X1 = 5 GALLONS IN CUBITAINER	
FED EX		08/26/05		JFU		08/26/05 07:30		X2 = 3 LITERS IN POLY BAG	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		NOTE: UPON COMPLETION OF ANALYSIS	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		TRANSHIP TO LIONVILLE FOR FURTHER	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		ANALYSIS.	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			





October 7, 2005

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3190 George Washington Way  
MSIN H9-02  
Richland, WA 99352

Reference: **P.O. #630**  
**Eberline Services R5-08-192-7298, SDG H3340**

Dear Ms. Kessner:

Enclosed is a data report for four water samples designated under SAF No. B05-039 received at Eberline Services on August 25, 2005. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/njv

Enclosure: Data Package

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

Eberline Services  
W.O. No. R5-08-192-7298

Bechtel Hanford Inc.  
SDG H3340

Case Narrative

Page 1 of 1

## 1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3340 was composed of four water samples designated under SAF No. B05-039 with a Project Designation of: ERDF Lysimeter Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-mail on September 29, 2005.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analyses

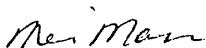
No problems were encountered during the course of the analyses.

### 2.2 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

### Case Narrative Certification Statement

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

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

10/7/05  
\_\_\_\_\_  
Date



EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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

T A B L E   O F   C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	14
Report Guides	.	.	.	17
End of Section	.	.	.	31

Melissa Mannion  
Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES  
Page 1  
SUMMARY DATA SECTION  
Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R508192-01	J03X48	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 08:30
R508192-02	J03X49	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 08:40
R508192-03	J03X50	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 10:45
R508192-04	J03X51	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 10:55
R508192-05	Lab Control Sample		WATER		B05-039		
R508192-06	Method Blank		WATER		B05-039		
R508192-07	Duplicate (R508192-01)	ERDF Cells 5&6	WATER		B05-039		08/24/05 08:30

Lab id EBRLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SAMPLE SOLIDS	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7298	B05-039-1	J03X48	WATER		2.0 L	08/25/05	1 R508192-01	7298-001
		J03X49	WATER		1.1 L	08/25/05	1 R508192-02	7298-002
		J03X50	WATER		2.0 L	08/25/05	1 R508192-03	7298-003
		J03X51	WATER		1.3 L	08/25/05	1 R508192-04	7298-004
		Method Blank	WATER				R508192-06	7298-006
		Lab Control Sample	WATER				R508192-05	7298-005
		Duplicate (R508192-01)	WATER		2.0 L	08/25/05	1 R508192-07	7298-007

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-QS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Beta Counting										
TC	WATER	Technetium 99 in Water	7136-098	10.0	4			1	1	1/1
Gas Proportional Counting										
93A	WATER	Gross Alpha in Water	7136-098	20.0	4			1	1	1/1
93B	WATER	Gross Beta in Water	7136-098	15.0	4			1	1	1/1

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

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-PBS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
R508192-01 08/24/05 08/25/05	J03X48 ERDF Cells 5&6 B05-039-1	B05-039	WATER	7298-001	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-02 08/24/05 08/25/05	J03X49 ERDF Cells 5&6 B05-039-1	B05-039	WATER	7298-002	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-03 08/24/05 08/25/05	J03X50 ERDF Cells 5&6 B05-039-1	B05-039	WATER	7298-003	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-04 08/24/05 08/25/05	J03X51 ERDF Cells 5&6 B05-039-1	B05-039	WATER	7298-004	93A/93 93B/93 TC		09/27/05 09/27/05 09/12/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-05	Lab Control Sample	B05-039	WATER	7298-005	93A/93 93B/93 TC		09/28/05 09/28/05 09/12/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-06	Method Blank	B05-039	WATER	7298-006	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-07 08/24/05 08/25/05	Duplicate (R508192-01) ERDF Cells 5&6	B05-039	WATER	7298-007	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	B05-039	Gross Alpha in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
93B/93	B05-039	Gross Beta in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
TC	B05-039	Technetium 99 in Water	TC99_TR_SEP_LSC	4			1	1	1		7
TOTALS				12			3	3	3		21

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LWS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-006

METHOD BLANK

Method Blank

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7298-006</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B05-039</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.502	0.80	1.4	3.0	U	93A
Gross Beta	12587-47-2	0.045	1.1	1.9	4.0	U	93B
Technetium 99	14133-76-7	0.090	1.6	5.5	15	U	TC

ERDF Lysmeter Sampling

QC-BLANK 54234
----------------

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>



EBERLINE SERVICES/RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-05</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7298-005</u>	Material/Matrix _____	<u>WATER</u>
	SAF No <u>B05-039</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	52.4	5.0	1.4	3.0	93A	71.3	2.9	73	75-125	70-130
Gross Beta	63.8	3.4	2.0	4.0	93B	66.3	2.7	96	76-124	80-120
Technetium 99	1060	27	5.6	15	TC	1090	44	97	84-116	80-120

ERDF Lysmeter Sampling

QC-LCS 54233

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

7298-007

J03X48

DUPLICATE

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R508192-07</u>	Lab sample id <u>R508192-01</u>	Client sample id <u>J03X48</u>
Dept sample id <u>7298-007</u>	Dept sample id <u>7298-001</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u> <u>WATER</u>
	Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 08:30</u> <u>2.0 L</u>
		Custody/SAF No <u>B05-039-1</u> <u>B05-039</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	-0.121	2.1	<u>4.4</u>	3.0	U	93A	0.361	2.1	<u>3.8</u>	U	-		
Gross Beta	14.2	2.0	2.3	4.0		93B	16.9	2.3	2.5		17	43	
Technetium 99	-0.588	1.6	5.5	15	U	TC	-0.617	1.4	3.8	U	-		

ERDF Lysmeter Sampling

QC-DUP#1 54235

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-001

J03X48

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-01</u>	Client sample id <u>J03X48</u>	
Dept sample id <u>7298-001</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 08:30</u>	<u>2.0 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.361	2.1	<u>3.8</u>	3.0	U	93A
Gross Beta	12587-47-2	16.9	2.3	2.5	4.0		93B
Technetium 99	14133-76-7	-0.617	1.4	3.8	15	U	TC

ERDF Lysmeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-002

J03X49

DATA SHEET

SDG. <u>7298</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508192-02</u>	Client sample id <u>J03X49</u>	
Dept sample id <u>7298-002</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 08:40</u>	<u>1.1 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.908	1.5	<u>3.5</u>	3.0	U	93A
Gross Beta	12587-47-2	16.1	2.4	2.7	4.0		93B
Technetium 99	14133-76-7	<u>-3.33</u>	2.1	6.5	15	U	TC

ERDF Lysmeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-003

J03X50

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508192-03</u>	Client sample id <u>J03X50</u>	
Dept sample id <u>7298-003</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 10:45</u>	<u>2.0 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.262	2.2	<u>4.1</u>	3.0	U	93A
Gross Beta	12587-47-2	15.4	2.4	2.8	4.0		93B
Technetium 99	14133-76-7	0.230	1.6	3.8	15	U	TC

ERDF Lysmeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

7298-004

J03X51

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508192-04</u>	Client sample id <u>J03X51</u>	
Dept sample id <u>7298-004</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 10:55</u>	<u>1.3 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.345	1.7	<u>3.6</u>	3.0	U	93A
Gross Beta	12587-47-2	15.2	2.4	2.7	4.0		93B
Technetium 99	14133-76-7	-0.629	1.6	5.6	15	U	TC

ERDF Lysmeter Sampling

DATA SHEETS

Page 4

SUMMARY DATA SECTION

Page 13

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test TC Matrix WATER  
SDG 7298  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN WATER  
BETA COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB	RAW	SUF-			Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT	SAMPLE ID	99
Preparation batch 7136-098					
R508192-01		7298-001	J03X48		U
R508192-02		7298-002	J03X49		U
R508192-03		7298-003	J03X50		U
R508192-04		7298-004	J03X51		U
R508192-05		7298-005	LCS (QC ID=54233)		ok
R508192-06		7298-006	BLK (QC ID=54234)		U
R508192-07		7298-007	Duplicate (R508192-01)		- U
Nominal values and limits from method			RDLs (pCi/L)	15	
ERDF Lysmeter Sampling					

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-			
SAMPLE ID	TEST FIX	CLIENT	SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7136-098		2σ prep error 10.0 %		Reference Lab Notebook 7136 pg. 098												
R508192-01		J03X48		3.8	0.100			93		100			20	09/08/05	09/13	GRB-218
R508192-02		J03X49		6.5	0.100			60		100			20	09/08/05	09/13	GRB-219
R508192-03		J03X50		3.8	0.100			92		100			20	09/08/05	09/13	GRB-220
R508192-04		J03X51		5.6	0.100			91		50			19	09/08/05	09/12	GRB-220
R508192-05		LCS (QC ID=54233)		5.6	0.100			92		50				09/08/05	09/12	GRB-221
R508192-06		BLK (QC ID=54234)		5.5	0.100			91		50				09/08/05	09/13	GRB-222
R508192-07		Duplicate (R508192-01)		5.5	0.100			92		50			20	09/08/05	09/13	GRB-223
		(QC ID=54235)														
Nominal values and limits from method			15	0.100			20-105	50		180						

PROCEDURES REFERENCE TC99\_TR\_SEP\_LSC  
CP-431 Technetium-99 Purification of Soil or Resin by  
Extraction Chromatography, rev 2  
CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 5.2 ± 2.0  
FOR 7 SAMPLES YIELD 87 ± 24

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test 93A Matrix WATER  
SDG 7298  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN WATER  
GAS PROPORTIONAL COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB	RAW	SUF-			Gross Alpha
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		
Preparation batch 7136-098					
R508192-01	93	7298-001	J03X48		U
R508192-02	93	7298-002	J03X49		U
R508192-03	93	7298-003	J03X50		U
R508192-04	93	7298-004	J03X51		U
R508192-05	93	7298-005	LCS (QC ID=54233)		<u>LOW</u>
R508192-06	93	7298-006	BLK (QC ID=54234)		U
R508192-07	93	7298-007	Duplicate (R508192-01)		- U

Nominal values and limits from method RDLs (pCi/L) 3.0  
ERDF Lysometer Sampling

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7136-098 2σ prep error 20.0 % Reference Lab Notebook 7136 pg. 098															
R508192-01	93	J03X48	<u>3.8</u>	<u>0.275</u>			240	100				34	09/27/05	09/27	GRB-105
R508192-02	93	J03X49	<u>3.5</u>	<u>0.225</u>			177	100				34	09/27/05	09/27	GRB-109
R508192-03	93	J03X50	<u>4.1</u>	<u>0.260</u>			230	100				34	09/27/05	09/27	GRB-110
R508192-04	93	J03X51	<u>3.6</u>	<u>0.225</u>			201	100				34	09/27/05	09/27	GRB-111
R508192-05	93	LCS (QC ID=54233)	1.4	0.300			59	100					09/27/05	09/28	GRB-105
R508192-06	93	BLK (QC ID=54234)	1.4	0.300			59	100					09/27/05	09/27	GRB-210
R508192-07	93	Duplicate (R508192-01) (QC ID=54235)	<u>4.4</u>	<u>0.275</u>			238	100				34	09/27/05	09/27	GRB-211
Nominal values and limits from method			3.0	0.300			5-250	100				180			

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

AVERAGES ± 2 SD MDA 3.2 ± 2.5  
FOR 7 SAMPLES RESIDUE 172 ± 161

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/29/05



EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3340

Test 93B Matrix WATER  
SDG 7298  
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS BETA IN WATER  
GAS PROPORTIONAL COUNTING

Client Hanford  
Contract No. 630  
Contract SDG H3340

RESULTS

LAB RAW SUF-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Beta

Preparation batch 7136-098

R508192-01	93	7298-001	J03X48	16.9
R508192-02	93	7298-002	J03X49	16.1
R508192-03	93	7298-003	J03X50	15.4
R508192-04	93	7298-004	J03X51	15.2
R508192-05	93	7298-005	LCS (QC ID=54233)	ok
R508192-06	93	7298-006	BLK (QC ID=54234)	U
R508192-07	93	7298-007	Duplicate (R508192-01)	ok

Nominal values and limits from method RDLs (pCi/L) 4.0  
ERDF Lysmeter Sampling

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- RESID EFF COUNT FWHM DRIFT DAYS ANAL-  
SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/L L FAC TION mg % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7136-098 2σ prep error 15.0 % Reference Lab Notebook 7136 pg. 098

R508192-01	93	J03X48	2.5	<u>0.275</u>	240	100	34	09/27/05	09/27	GRB-105
R508192-02	93	J03X49	2.7	<u>0.225</u>	177	100	34	09/27/05	09/27	GRB-109
R508192-03	93	J03X50	2.8	<u>0.260</u>	230	100	34	09/27/05	09/27	GRB-110
R508192-04	93	J03X51	2.7	<u>0.225</u>	201	100	34	09/27/05	09/27	GRB-111
R508192-05	93	LCS (QC ID=54233)	2.0	0.300	59	100		09/27/05	09/28	GRB-105
R508192-06	93	BLK (QC ID=54234)	1.9	0.300	59	100		09/27/05	09/27	GRB-210
R508192-07	93	Duplicate (R508192-01) (QC ID=54235)	2.3	<u>0.275</u>	238	100	34	09/27/05	09/27	GRB-211

Nominal values and limits from method 4.0 0.300 5-250 100 180

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

AVERAGES ± 2 SD MDA 2.4 ± 0.72  
FOR 7 SAMPLES RESIDUE 172 ± 161

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 16

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

R E P O R T   G U I D E

Client Hanford  
Contract No. 630  
Case no SDG H3340

S A M P L E   S U M M A R Y

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

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

The following notes apply to these reports:

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

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

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 17

Lab id EBRLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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 Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 19

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

R E P O R T   G U I D E

Client Hanford  
Contract No. 630  
Case no SDG H3340

D A T A   S H E E T

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES  
Page 4  
SUMMARY DATA SECTION  
Page 20

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 630  
Case no SDG H3340

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.

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

DATA SHEET

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

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05



EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 24

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

DUPLICATE

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

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

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

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

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

R E P O R T   G U I D E

Client Hanford  
Contract No. 630  
Case no SDG H3340

M A T R I X   S P I K E

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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

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

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 26

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

MATRIX SPIKE

for the recovery.

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

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

REPORT GUIDES

Page 11

SUMMARY DATA SECTION

Page 27

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 28

Lab id EBRINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

METHOD SUMMARY

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
  - \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- \* Aliquots are underlined if less than the nominal value specified for the method.
  - \* Preparation factors are underlined if greater than the nominal value specified for the method.
  - \* Dilution factors are underlined if greater than the nominal value specified for the method.
  - \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
  - \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
  - \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 29

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

METHOD SUMMARY

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

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

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

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

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

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

REPORT GUIDES  
Page 14  
SUMMARY DATA SECTION  
Page 30

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

METHOD SUMMARY

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

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

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

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

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 31

Lab id EBRLINE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/29/05





Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1	
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code	
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		H3340 (7298)		SAF No. B05-039		Data Turnaround 45 Days	
Ice Chest No. ERC 01 030		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX		Air Quality <input type="checkbox"/>	
Shipped To EBERLINE SERVICES/ LIONVILLE		Offsite Property No. A050 310				Bill of Lading/Air Bill No. SEE OSPC			
POSSIBLE SAMPLE HAZARDS/REMARKS ACIDIC NONE 4/28/05					Preservation NONE ADG 82305 PH 2	Cool 4C			
Special Handling and/or Storage NONE					Type of Container G/P	P			
					No. of Container(s) 2	1			
					Volume 1000mL	-500mL L 4/28/05			
SAMPLE ANALYSIS					Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300.0 (Chloride)			
Sample No.	Matrix *	Sample Date	Sample Time						
J03X48	4/28/05 WATER								
J03X49	WATER	8-24-05	0840	X					
J03X50	4/28/05 WATER								
J03X51	WATER								
CHAIN OF POSSESSION					SPECIAL INSTRUCTIONS				
Relinquished By/Removed From		Date/Time		Sign/Print Names		Date/Time		Matrix *	
SJ GALE		8/24/05 1400		FED EX				S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other	
FED EX		08/25/05		RFM		08/25/05 9:20			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION	Received By	Title				Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time			

A-70

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1	
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code	
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		H3340 (7298)		SAF No. B05-039		Air Quality <input type="checkbox"/>	
Ice Chest No. <sup>07030</sup> ERC 050 310 #824		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX			
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A050 310		Bill of Lading/Air Bill No. SEE OSPC					
POSSIBLE SAMPLE HAZARDS/REMARKS ACIDIC			Preservation	HNO3 to pH <2	Cool 4C				
Special Handling and/or Storage NONE			Type of Container	G/P	P				
			No. of Container(s)	2	1				
			Volume	1000mL	500mL				
SAMPLE ANALYSIS			Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300.0 (Chloride)					
Sample No.	Matrix *	Sample Date	Sample Time						
J03X48	WATER								
J03X49	WATER								
J03X50	WATER	8-24-05	1045	X					
J03X51	WATER								
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
S. GALE		8/24/05 1400	FED EX						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
FED EX		08/25/05	MEM		08/25/05 9:20				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
LABORATORY SECTION		Received By			Title	Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method			Disposed By	Date/Time			

Matrix \*

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

A-71

WCH-42  
Rev. 0

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			<b>B05-039-1</b>	Page 1 of 1
Collector SJ, GALE	Company Contact KESSNER, JH	Telephone No. 375-4688	Project Coordinator KESSNER, JH		Price Code	Data Turnaround
Project Designation ERDF Lysimeter Sampling	Sampling Location ERDF CELLS 5&6	<b>H 3340 (7298)</b>		SAF No. B05-039	Air Quality <input type="checkbox"/>	<b>45 Days</b>
Ice Chest No. <b>ERC 01 030</b>	Field Logbook No. EL-1518-2	COA RERDF22560	Method of Shipment FED EX			
Shipped To <b>EBERLINE SERVICES LIONVILLE</b>	Offsite Property No. <b>A050310</b>	Bill of Lading/Air Bill No. SEE OSPC				

<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> ACIDIC NONE SA 82305  <b>Special Handling and/or Storage</b> NONE	Preservation	<i>note</i> MS 8225 HNO3 to pH -2	Cool 4C							
	Type of Container	G/P	P							
	No. of Container(s)	2	1							
	Volume	1000mL	<del>500mL</del> IL SA 82305							

<b>SAMPLE ANALYSIS</b>										
Gross Alpha:	Gross Beta:	Technetium-99	IC Anions -	300.0	(Chloride)					

Sample No.	Matrix *	Sample Date	Sample Time							
J03X48	WATER									
J03X49	WATER									
J03X50	WATER									
J03X51	WATER	8/24/05	1055	X						

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS	Matrix *
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time		
<i>[Signature]</i>	8/24/05 1400	FED EX			
FED EX	08/25/05	MEM	08/25/05 9:30		

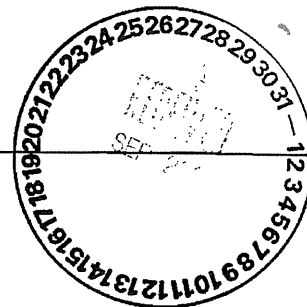
<b>LABORATORY SECTION</b>	Received By	Title	Date/Time
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method	Disposed By	Date/Time

A-72





27 September 2005



Joan Kessner  
Bechtel-Hanford, Inc.  
3190 Washington Way  
MSIN H9-03  
Richland, WA 99352

**Subject: Contract No. 630  
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 #	0508L223
SDG #	H3340
SAF #	<del>B05-004</del> B05-039 NB
Date Received	8-25-05
# Samples	4
Matrix	Water
Volatiles	
Semivolatiles	
Pest/PCB	
PAH	
DRO/KRO/GRO	
GC Alcohols	
Herbicides	
Metals	
Inorganics	X

10/4/05

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

Sincerely,  
Lionville Laboratory Incorporated

Orlette S. Johnson  
Project Manager

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

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B05-039 H3340

DATE RECEIVED: 08/25/05

LVL LOT # :0508L223

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J03X48						
CHLORIDE BY IC	001	W	05LICA67	08/24/05	09/06/05	09/06/05
CHLORIDE BY IC	001 REP	W	05LICA67	08/24/05	09/06/05	09/06/05
CHLORIDE BY IC	001 MS	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X49						
CHLORIDE BY IC	002	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X50						
CHLORIDE BY IC	003	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X51						
CHLORIDE BY IC	004	W	05LICA67	08/24/05	09/06/05	09/06/05
LAB QC:						
CHLORIDE BY IC	MB1	W	05LICA67	N/A	09/06/05	09/06/05
CHLORIDE BY IC	MB1 BS	W	05LICA67	N/A	09/06/05	09/06/05



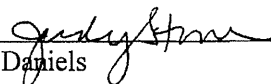
**Analytical Report**

**Client:** TNU-HANFORD B05-039 H3340  
**LVL#:** 0508L223

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 08-25-05

**INORGANIC NARRATIVE**

1. This narrative covers the analysis of 4 water samples.
2. The samples were prepared and analyzed in accordance with the method checked on the attached glossary.  
  
LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank was within the method criteria.
6. The Laboratory Control Sample (LCS) was within the laboratory control limits.
7. The matrix spike recovery was within the 75-125% control limits.
8. The replicate analysis was within the 20% Relative Percent Difference (RPD) control limit.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory Incorporated

9/13/05  
Date

njp\08-223

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 14 pages.



Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	305.1		
___Alkalinity ___Bicarbonate ___Carbonate	310.1		
BOD	405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide <input checked="" type="checkbox"/> Chloride ___Fluoride	<input checked="" type="checkbox"/> 300.0	___ 9056	
___Nitrate ___Nitrite ___Phosphate	300.0	___ 9056	
___Sulfate ___Formate ___Acetate ___Oxalate	300.0	___ 9056	
Chloride	325.2	___ 9251	
Chlorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	___ 9010B	
Cyanide, Total	335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (b)
COD	410.4(mod)		___ 5220C (b)
Color	110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	340.2		___ 4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	353.2		
Ammonia	350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	351.3		
Total ___ Organic ___ Inorganic Carbon	415.1	___ 9060	
Oil & Grease	413.1	___ 9070	
___ pH ___ pH; paper	150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	418.1		
Phenol	420.1	___ 420.2 ___ 9065 ___ 9066	
___Ortho ___Total Phosphate	365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	160.5		
Sulfide	376.1		___ 9030B/9034 (acid soluble)
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (___9014___9030B)	
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	___ 9038	
Specific Conductance	120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		___ 1312	
Total ___Dissolved ___Suspended ___Solids	160 ___ .1 ___ .2 ___ .3		
Total Organic Halides	450.1	___ 9020B	
Turbidity	180.1		
Volatile Solids:			
___Total ___Dissolved ___Suspended	160.4		
Other:		Method:	

## 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 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03X48	Chloride by IC	62.8	MG/L	2.5	10.0
-002	J03X49	Chloride by IC	79.0	MG/L	2.5	10.0
-003	J03X50	Chloride by IC	23.8	MG/L	2.5	10.0
-004	J03X51	Chloride by IC	30.6	MG/L	2.5	10.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LICA67-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J03X48	Chloride by IC	160	62.8	100	97.5	20.0
BLANK10	05LICA67-MB1	Chloride by IC	4.7	0.25u	5.0	94.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J03X48	Chloride by IC	62.8	57.4	9.0	10.0



Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1	
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code	
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		SAF No. B05-039		Air Quality <input type="checkbox"/>		Data Turnaround <b>45 Days</b>	
Ice Chest No. <i>ERC 02 501</i>		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX			
Shipped To EBERLINE SERVICES <u>LIONVILLE</u>		Offsite Property No. <i>A050361</i>				Bill of Lading/Air Bill No. SEE OSPC			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>ACIDIC</i>			Preservation	HNO3 to pH 2	Cool 4C				
Special Handling and/or Storage <i>NONE</i>			Type of Container	G/P	P				
			No. of Container(s)	2	1				
			Volume	1000mL	500mL				
SAMPLE ANALYSIS				Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300.0 (Chloride)				
Sample No.	Matrix *	Sample Date	Sample Time						
J03X48	WATER	8-24-05	0830		X				
<del>J03X49</del> <i>11/22/05</i>	<del>WATER</del>								
<del>J03X50</del> <i>11/22/05</i>	<del>WATER</del>								
<del>J03X51</del> <i>11/22/05</i>	<del>WATER</del>								
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time	Matrix * S=Soil; SE=Sediment SO=Solid SI=Sediment W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other			
<i>SJ GALE</i>		<i>82405 1400</i>	<i>FED EX</i>						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
<i>REP EX</i>			<i>[Signature]</i>		<i>8/25/05 0905</i>				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
LABORATORY SECTION		Received By		Title		Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

BHI-EE-011 (03/01/2002)



Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1	
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code	
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		SAF No. B05-039		Air Quality <input type="checkbox"/>		Data Turnaround <b>45 Days</b>	
Ice Chest No. <i>ERC 02 501</i>		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX			
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. <i>A050361</i>				Bill of Lading/Air Bill No. SEE OSPC			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>ACIDIC NONE 4/10/05</i>				Preservation <i>NIDP NO 1234 -2</i>	Cool 4C				
Special Handling and/or Storage <i>NONE</i>				Type of Container G/P	P				
				No. of Container(s) 2	1				
				Volume 1000mL	<del>500mL</del> <i>L 4/10/05</i>				
SAMPLE ANALYSIS				Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300.0 (Chloride)				
Sample No.	Matrix *	Sample Date	Sample Time						
<del>J03X48</del>	<del>WATER</del>								
J03X49	WATER	8-24-05	0840		X				
<del>J03X50</del>	<del>WATER</del>								
J03X51	WATER								
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>SJ GALE</i>		Date/Time <i>8/24/05 1400</i>	Received By/Stored In <i>FED EX</i>		Date/Time	Matrix * S=Soil SE=Soilment 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			
Relinquished By/Removed From <i>FED EX</i>		Date/Time	Received By/Stored In <i>[Signature]</i>		Date/Time <i>8/25/05 0905</i>				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time				
LABORATORY SECTION	Received By		Title			Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method		Disposed By			Date/Time			

BHI-EE-011 (03/01/2002)

A-85

MCH-42  
Rev. 0

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1		
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code Data Turnaround		
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		SAF No. B05-039		Air Quality <input type="checkbox"/>		45 Days		
Ice Chest No. ERC 02501		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX				
Shipped To EBERLINE SERVICES (LIONVILLE)		Offsite Property No. A050361				Bill of Lading/Air Bill No. SEE OSPC				
POSSIBLE SAMPLE HAZARDS/REMARKS ACIDIC				Preservation	HNO3 to pH 2	Cool 4C				
				Type of Container	G/P	P				
				No. of Container(s)	2	1				
				Volume	1000mL	500mL				
Special Handling and/or Storage NONE										
SAMPLE ANALYSIS				Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300.0 (Chloride)					
Sample No.	Matrix *	Sample Date	Sample Time							
J03X48	WATER									
J03X49	WATER									
J03X50	WATER	8/24/05	1045		X					
J03X51	WATER									
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time W=Wipe L=Liquid V=Vegetation X=Other
S. GALE		8/21/05 1400		FED EX						
P. DEB				J. K...		8/25/05 0905				
LABORATORY SECTION	Received By	Title				Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time				

BHI-EE-011 (03/01/2002)

A-86

MCH-42 Rev. 0

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-039-1		Page 1 of 1		
Collector SJ, GALE		Company Contact KESSNER, JH		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code		
Project Designation ERDF Lysimeter Sampling		Sampling Location ERDF CELLS 5&6		SAF No. B05-039		Air Quality <input type="checkbox"/>		Data Turnaround 45 Days		
Ice Chest No. ERC 02 501		Field Logbook No. EL-1518-2		COA RERDF22560		Method of Shipment FED EX				
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A050361				Bill of Lading/Air Bill No. SEE OSPC				
POSSIBLE SAMPLE HAZARDS/REMARKS NONE				Preservation Cool 4C						
Special Handling and/or Storage NONE				Type of Container G/P		P				
				No. of Container(s) 2		1				
				Volume 1000mL		500mL		1L of A050361		
SAMPLE ANALYSIS				Gross Alpha; Gross Beta; Technetium-99		IC Anion - 300.0 (Chloride)				
Sample No.	Matrix *	Sample Date	Sample Time							
J03X48	WATER									
J03X49	WATER									
J03X50	WATER									
J03X51	WATER	8-24-05	1055		X					
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				S=Soil SB=Sediment SO=Solid SI=Sedgc W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Time WI=Wipe L=Liquid V=Vegetation X=Other
S. J. GALE		8/24/05 1400		FED EX						
Fed Ex				K. J. J.		8/25/05 0905				
LABORATORY SECTION	Received By	Title				Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time				

Lionville Laboratory Incorporated  
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: *TNU Hartford*

Date: *8/25/05*

Purchase Order / Project# /  
SAF# / SOW# / Release #: *B05-039*

LvLI Batch #: *0508L223*

Sample Custodian: *[Signature]*

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |  |  |   |  |
|---|--|--|---|--|
| 1. Samples Hand Delivered or <u>Shipped</u>   | Carrier  | <i>FedEx</i>                           | Airbill#                                  | <i>7925 0983 5512</i>  |
| 2. Custody seals on coolers or shipping container intact, signed and dated?   | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> No Seals         | Comments   |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 5. Samples received <u>cooled</u> or ambient?   | Temp   | <i>1.9 °C</i>                          | Cooler #                                  | <i>ERC-02-051</i><br><i>JPstbster</i><br><i>501</i>            |
| 6. Custody seals on sample containers intact, signed and dated?   | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> No Seals         |  |
| 7. coc signed and dated?  | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 8. Sample containers are intact?  | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 9. All samples on coc received? All samples received on coc?  | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 10. All sample label information matches coc?   | <del><input checked="" type="checkbox"/> Yes</del> | <input checked="" type="checkbox"/> No |   | <i>002, 004 - CDC says matrix is water, samples are solids</i> |
| 11. Samples properly preserved?   | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   | <i>water absorbed in "foam"</i>                                |
| 12. Samples received within hold times? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            |   |  |
| 13. VOA, TOC, TOX free of headspace?  | <input type="checkbox"/> Yes                       | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A   |  |
| 14. QC stickers placed on bottles designated by client?   | <input type="checkbox"/> Yes                       | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A   |  |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)     | <input checked="" type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |   | <i>not 9-12-05 → liquid analyzed</i>                           |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)                             | <input checked="" type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input type="checkbox"/> No Discrepancies |  |

SR-002-B



## DISTRIBUTION

### Washington Closure Hanford

K. R. Fecht	H9-01
S. J. Gale	H0-23
J. R. James	T2-03
A. R. Michael	T2-03
M. L. Proctor	H9-03
J. E. Rugg	T2-03

Records and Document Control	H0-30
DOE-RL Public Reading Room	H2-53
Hanford Technical Library	P8-55

