



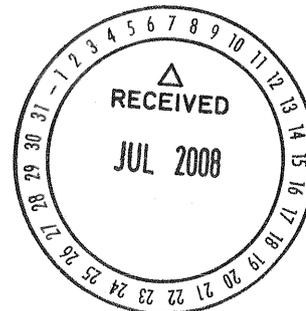
# EBERLINE SERVICES

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July 3, 2008

Mr. Steve Trent  
Fluor Hanford Inc.  
1200 Jadwin Avenue  
Richland, WA 99352

Reference: **P.O. #33677**  
**Eberline Services R8-05-181-7099, SDG H3743**



Dear Mr. Trent:

Enclosed is the report for three solid (soil) samples designated under SAF No. F08-031 received at Eberline Services on May 22, 2008. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

FOR Melissa C. Mannion  
Senior Program Manager

MCM/njv

Enclosure: Data Package

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## 1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3743 was composed of three solid (soil) samples designated under SAF No. F08-031 with a Project Designation of: 216-B-55 Supplemental Characterization.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

## 2.0 ANALYSIS NOTES

### 2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

### 2.2 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

### 2.3 Total Strontium Analysis

No problems were encountered during the course of the analyses.

### 2.4 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

### 2.5 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

### 2.6 Isotopic Uranium Analysis

The U-232 tracer yield for the QC LCS was 109%, greater than the control limit of 105%. No other problems were encountered during the course of the analyses.

### 2.7 Neptunium-237 Analysis

No problems were encountered during the course of the analyses.

### 2.8 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

### 2.9 Americium-241 Analysis

No problems were encountered during the course of the analyses.

**2.10 Gamma Spectroscopy**

No problems were encountered during the course of the analyses.

**3.0 Case Narrative Certification Statement**

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

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

*7/3/08*  
\_\_\_\_\_  
**Date**

E B E R L I N E   S E R V I C E S / R I C H M O N D  
S A M P L E   D E L I V E R Y   G R O U P   H 3 7 4 3

SDG 7099  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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	.	.	.	9
Lab Control Samples	.	.	.	11
Duplicates	.	.	.	12
Data Sheets	.	.	.	14
Method Summaries	.	.	.	17
Report Guides	.	.	.	27
End of Section	.	.	.	41

\_\_\_\_\_  
Prepared by *MJ*

\_\_\_\_\_  
Reviewed by *MJ*

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 07/03/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000005

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SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 33677  
Case no SDG H3743

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 Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000006

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

LAB	CLIENT	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
SAMPLE ID	SAMPLE ID						
R805181-01	B1VDM1	C6743, I-001	SOLID		F08-031	F08-031-150	05/12/08 09:15
R805181-02	B1VDR8	C6743, I-002	SOLID		F08-031	F08-031-156	05/12/08 10:45
R805181-03	B1VDT1	C6743, I-002-DUP	SOLID		F08-031	F08-031-161	05/12/08 10:45
R805181-04	Lab Control Sample		SOLID		F08-031		
R805181-05	Method Blank		SOLID		F08-031		
R805181-06	Duplicate (R805181-01)	C6743, I-001	SOLID		F08-031		05/12/08 09:15

LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 07/03/08

00000007

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7099	F08-031-150	B1VDM1	SOLID	93.2	590 g		05/22/08 10		R805181-01	7099-001
	F08-031-156	B1VDR8	SOLID	90.7	620 g		05/22/08 10		R805181-02	7099-002
	F08-031-161	B1VDT1	SOLID	91.7	645 g		05/22/08 10		R805181-03	7099-003
		Method Blank	SOLID						R805181-05	7099-005
		Lab Control Sample	SOLID						R805181-04	7099-004
		Duplicate (R805181-01)	SOLID	93.2	590 g		05/22/08 10		R805181-06	7099-006

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 07/03/08

00000008

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI- FIERS
			BATCH	2σ %	CLIENT MORE	RE BLANK	LCS DUP/ORIG MS/ORIG		
<b>Alpha Spectroscopy</b>									
AM	SOLID	Americium 241 in Solids	6150-098	8.0	3	1	1	1/1	
NP	SOLID	Neptunium in Solids	6150-098	14.8	3	1	1	1/1	
PU	SOLID	Plutonium, Isotopic in Solids	6150-098	8.0	3	1	1	1/1	
TH	SOLID	Thorium, Isotopic in Solids	6150-098	8.0	3	1	1	1/1	
U	SOLID	Uranium, Isotopic in Solids	6150-098	8.0	3	1	1	1/1	
<b>Beta Counting</b>									
SR	SOLID	Total Strontium in Solids	6150-098	10.4	3	1	1	1/1	
TC	SOLID	Technetium 99 in Solids	6150-098	13.2	3	1	1	1/1	
<b>Gamma Spectroscopy</b>									
GAM	SOLID	Gamma Scan	6150-098	7.0	3	1	1	1/1	
<b>Liquid Scintillation Counting</b>									
H	SOLID	Tritium in Solids	6150-098	10.0	3	1	1	1/1	
NI_L	SOLID	Nickel 63 in Solids	6150-098	11.2	3	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 Fluor  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 07/03/08

00000009

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

**LAB WORK SUMMARY**

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION		MATRIX		SUF-					
RECEIVED	CUSTODY	SAF No		PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
R805181-01	B1VDM1			7099-001	AM		06/24/08	06/26/08	BW	Americium 241 in Solids
05/12/08	C6743, I-001		SOLID	7099-001	GAM		06/11/08	06/30/08	CSS	Gamma Scan
05/22/08	F08-031-150	F08-031		7099-001	H		07/01/08	07/03/08	BW	Tritium in Solids
				7099-001	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids
				7099-001	NP		06/27/08	07/01/08	BW	Neptunium in Solids
				7099-001	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids
				7099-001	SR		06/23/08	06/24/08	BW	Total Strontium in Solids
				7099-001	TC		06/23/08	06/25/08	BW	Technetium 99 in Solids
				7099-001	TH		06/17/08	06/19/08	BW	Thorium, Isotopic in Solids
				7099-001	U		06/18/08	06/18/08	BW	Uranium, Isotopic in Solids
R805181-02	B1VDR8			7099-002	AM		06/26/08	06/26/08	BW	Americium 241 in Solids
05/12/08	C6743, I-002		SOLID	7099-002	GAM		06/11/08	06/30/08	CSS	Gamma Scan
05/22/08	F08-031-156	F08-031		7099-002	H		07/01/08	07/03/08	BW	Tritium in Solids
				7099-002	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids
				7099-002	NP		06/27/08	07/01/08	BW	Neptunium in Solids
				7099-002	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids
				7099-002	SR		06/23/08	06/24/08	BW	Total Strontium in Solids
				7099-002	TC		06/21/08	06/25/08	BW	Technetium 99 in Solids
				7099-002	TH		06/17/08	06/19/08	BW	Thorium, Isotopic in Solids
				7099-002	U		06/17/08	06/18/08	BW	Uranium, Isotopic in Solids
R805181-03	B1VDT1			7099-003	AM		06/25/08	06/26/08	BW	Americium 241 in Solids
05/12/08	C6743, I-002-DUP		SOLID	7099-003	GAM		06/11/08	06/30/08	CSS	Gamma Scan
05/22/08	F08-031-161	F08-031		7099-003	H		07/01/08	07/03/08	BW	Tritium in Solids
				7099-003	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids
				7099-003	NP		06/27/08	07/01/08	BW	Neptunium in Solids
				7099-003	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids
				7099-003	SR		06/23/08	06/24/08	BW	Total Strontium in Solids
				7099-003	TC		06/23/08	06/25/08	BW	Technetium 99 in Solids
				7099-003	TH		06/17/08	06/19/08	BW	Thorium, Isotopic in Solids
				7099-003	U		06/17/08	06/18/08	BW	Uranium, Isotopic in Solids

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 07/03/08

00000010

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

**WORK SUMMARY, cont.**

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION	MATRIX			SUF-					
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
805181-04	Lab Control Sample		7099-004	AM		06/25/08	06/26/08	BW	Americium 241 in Solids	
		SOLID	7099-004	GAM		06/11/08	06/30/08	CSS	Gamma Scan	
		F08-031	7099-004	H		07/01/08	07/03/08	BW	Tritium in Solids	
			7099-004	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids	
			7099-004	NP		06/27/08	07/01/08	BW	Neptunium in Solids	
			7099-004	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids	
			7099-004	SR		06/23/08	06/24/08	BW	Total Strontium in Solids	
			7099-004	TC		06/21/08	06/25/08	BW	Technetium 99 in Solids	
			7099-004	TH		06/17/08	06/19/08	BW	Thorium, Isotopic in Solids	
			7099-004	U		06/17/08	06/18/08	BW	Uranium, Isotopic in Solids	
805181-05	Method Blank		7099-005	AM		06/25/08	06/26/08	BW	Americium 241 in Solids	
		SOLID	7099-005	GAM		06/11/08	06/30/08	CSS	Gamma Scan	
		F08-031	7099-005	H		07/01/08	07/03/08	BW	Tritium in Solids	
			7099-005	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids	
			7099-005	NP		06/27/08	07/01/08	BW	Neptunium in Solids	
			7099-005	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids	
			7099-005	SR		06/23/08	06/24/08	BW	Total Strontium in Solids	
			7099-005	TC		06/21/08	06/25/08	BW	Technetium 99 in Solids	
			7099-005	TH		06/17/08	06/19/08	BW	Thorium, Isotopic in Solids	
			7099-005	U		06/17/08	06/18/08	BW	Uranium, Isotopic in Solids	
805181-06	Duplicate (R805181-01)		7099-006	AM		06/25/08	06/26/08	BW	Americium 241 in Solids	
05/12/08	C6743, I-001	SOLID	7099-006	GAM		06/11/08	06/30/08	CSS	Gamma Scan	
05/22/08		F08-031	7099-006	H		07/01/08	07/03/08	BW	Tritium in Solids	
			7099-006	NI_L		06/20/08	06/26/08	BW	Nickel 63 in Solids	
			7099-006	NP		06/27/08	07/01/08	BW	Neptunium in Solids	
			7099-006	PU		06/25/08	06/26/08	BW	Plutonium, Isotopic in Solids	
			7099-006	SR		06/23/08	06/24/08	BW	Total Strontium in Solids	
			7099-006	TC		06/25/08	06/25/08	BW	Technetium 99 in Solids	
			7099-006	TH		06/18/08	06/19/08	BW	Thorium, Isotopic in Solids	
			7099-006	U		06/17/08	06/18/08	BW	Uranium, Isotopic in Solids	

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

Page 7

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 07/03/08

00000011

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

**WORK SUMMARY, cont.**

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	F08-031	Americium 241 in Solids	AMCMISO_IE_PLATE_AEA	3			1	1	1	6
GAM	F08-031	Gamma Scan	GAMMA_GS	3			1	1	1	6
H	F08-031	Tritium in Solids	TRITIUM_COX_LSC	3			1	1	1	6
NI_L	F08-031	Nickel 63 in Solids	NI63_LSC	3			1	1	1	6
NP	F08-031	Neptunium in Solids	NP237_LLE_PLATE_AEA	3			1	1	1	6
PU	F08-031	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	3			1	1	1	6
SR	F08-031	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	3			1	1	1	6
TC	F08-031	Technetium 99 in Solids	TC99_TR_SEP_GPC	3			1	1	1	6
TH	F08-031	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	3			1	1	1	6
U	F08-031	Uranium, Isotopic in Solids	UIISO_PLATE_AEA	3			1	1	1	6
<b>TOTALS</b>				<b>30</b>			<b>10</b>	<b>10</b>	<b>10</b>	<b>60</b>

WORK SUMMARY

Page 3

SUMMARY DATA SECTION

Page 8

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 07/03/08

00000012

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3743

7099-005

Method Blank

METHOD BLANK

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG <u>H3743</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R805181-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7099-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F08-031</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.931	1.9	3.09	400	U	H
Nickel 63	13981-37-8	0.591	1.7	2.89	30.0	U	NI_L
Total Strontium	SR-RAD	-0.042	0.15	0.330	1.00	U	SR
Technetium 99	14133-76-7	0.029	0.16	0.353	12.0	U	TC
Thorium 228	14274-82-9	0	0.17	0.322	1.00	U	TH
Thorium 230	14269-63-7	0	0.17	0.222	1.00	U	TH
Thorium 232	TH-232	-0.029	0.058	0.222	1.00	U	TH
Uranium 233/234	U-233/234	0.025	0.050	0.189	1.00	U	U
Uranium 235	15117-96-1	0.030	0.060	0.229	1.00	U	U
Uranium 238	U-238	0	0.049	0.189	1.00	U	U
Neptunium 237	13994-20-2	0.095	0.19	0.286	1.00	U	NP
Americium 241	14596-10-2	-0.041	0.083	0.317	1.00	U	AM
Plutonium 238	13981-16-3	0	0.060	0.228	1.00	U	PU
Plutonium 239/240	PU-239/240	-0.030	0.060	0.228	1.00	U	PU
Beryllium 7	13966-02-4	U		0.708		U	GAM
Potassium 40	13966-00-2	U		2.67		U	GAM
Cobalt 60	10198-40-0	U		0.092	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.752		U	GAM
Antimony 125	14234-35-6	U		0.233		U	GAM
Cesium 134	13967-70-9	U		0.114		U	GAM
Cesium 137	10045-97-3	U		0.091	0.100	U	GAM
Europium 152	14683-23-9	U		0.255	0.100	U	GAM
Europium 154	15585-10-1	U		0.276	0.100	U	GAM
Europium 155	14391-16-3	U		0.208	0.100	U	GAM
Niobium 94	14681-63-1	U		0.089		U	GAM
Radium 226	13982-63-3	U		0.210		U	GAM
Radium 228	15262-20-1	U		0.429		U	GAM
Sodium 22	13966-32-0	U		0.093		U	GAM

216-B-55 Supplemental Charactrization

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000013

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

7099-005

Method Blank

BLANK, cont.

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG <u>H3743</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R805181-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7099-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F08-031</u>	

QC-BLANK #66012

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

7099-004

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7099</u>	Client/Case no <u>Hanford</u> <span style="float:right">SDG <u>H3743</u></span>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>
Lab sample id <u>R805181-04</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7099-004</u>	Material/Matrix <u>SOLID</u>
	SAF No <u>F08-031</u>

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	572	9.4	3.35	400		H	610	24	94	85-115	80-120
Nickel 63	214	5.7	2.88	30.0		NI_L	220	8.8	97	82-118	80-120
Total Strontium	9.88	0.61	0.308	1.00		SR	9.31	0.37	106	80-120	80-120
Technetium 99	104	1.7	0.368	12.0		TC	109	4.4	95	80-120	80-120
Thorium 230	37.3	3.8	0.263	1.00		TH	37.8	1.5	99	80-120	80-120
Uranium 233/234	16.5	1.8	0.857	1.00		U	18.6	0.74	89	81-119	80-120
Uranium 235	13.4	1.6	0.217	1.00		U	15.1	0.60	89	80-120	80-120
Uranium 238	17.0	1.9	0.818	1.00		U	20.2	0.81	84	82-118	80-120
Neptunium 237	21.4	2.4	0.184	1.00		NP	19.8	0.79	108	69-131	80-120
Americium 241	19.2	2.6	0.349	1.00		AM	20.4	0.82	94	77-123	80-120
Plutonium 238	23.5	2.3	0.192	1.00		PU	23.4	0.94	100	80-120	80-120
Plutonium 239/240	26.4	2.5	0.192	1.00		PU	26.4	1.1	100	80-120	80-120
Cobalt 60	1.91	0.18	<u>0.122</u>	0.050		GAM	1.96	0.078	97	82-118	80-120
Cesium 137	2.19	0.17	<u>0.127</u>	0.100		GAM	2.13	0.085	103	83-117	80-120

216-B-55 Supplemental Charactrization

QC-LCS #66011
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LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 11

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000015

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

7099-006

B1VDM1

**DUPLICATE**

SDG <u>7099</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R805181-06</u> Dept sample id <u>7099-006</u> % solids <u>93.2</u>	Client/Case no <u>Hanford</u> SDG <u>H3743</u> Contract <u>No. 33677</u> ORIGINAL Lab sample id <u>R805181-01</u> Dept sample id <u>7099-001</u> Received <u>05/22/08</u> % solids <u>93.2</u>	Client sample id <u>B1VDM1</u> Location/Matrix <u>C6743, I-001</u> <u>SOLID</u> Collected/Weight <u>05/12/08 09:15</u> <u>590 g</u> Custody/SAF No <u>F08-031-150</u> <u>F08-031</u>
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ANALYTE	DUPLICATE		MDA	RDL	QUALI-	TEST	ORIGINAL		MDA	QUALI-	RPD	3σ	DER
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Tritium	0.091	1.5	2.63	400	U	H	0.946	1.6	2.63	U	-	0.8	
Nickel 63	2.38	1.9	3.10	30.0	U	NI_L	2.50	1.9	3.10	U	-	0.1	
Total Strontium	0.010	0.15	0.305	1.00	U	SR	-0.019	0.15	0.325	U	-	0.3	
Technetium 99	0.107	0.15	0.385	12.0	U	TC	0.045	0.20	0.368	U	-	0.5	
Thorium 228	0.218	0.26	0.418	1.00	U	TH	0.453	0.28	0.348		70	172	1.2
Thorium 230	0.348	0.35	0.333	1.00		TH	0.254	0.23	0.271	U	31	209	0.4
Thorium 232	0.697	0.35	0.333	1.00		TH	0.707	0.29	0.216		1	99	0
Uranium 233/234	0.244	0.11	0.081	1.00		U	0.263	0.18	0.224		7	126	0.2
Uranium 235	0	0.026	0.098	1.00	U	U	0	0.071	0.271	U	-	0	
Uranium 238	0.308	0.11	0.081	1.00		U	0.409	0.24	0.224		28	112	0.8
Neptunium 237	0.047	0.094	0.140	1.00	U	NP	-0.039	0.078	0.298	U	-	1.4	
Americium 241	-0.070	0.14	0.532	1.00	U	AM	-0.013	0.11	0.206	U	-	0.6	
Plutonium 238	0.025	0.10	0.190	1.00	U	PU	-0.035	0.14	0.390	U	-	0.7	
Plutonium 239/240	0.075	0.10	0.190	1.00	U	PU	0	0.071	0.270	U	-	1.2	
Beryllium 7	U		0.567		U	GAM	U		0.427	U	-	0.4	
Potassium 40	10.6	1.1	0.587			GAM	10.5	0.87	0.336		1	25	0.1
Cobalt 60	U		0.048	0.050	U	GAM	U		0.042	U	-	0.2	
Ruthenium 106	U		0.493		U	GAM	U		0.394	U	-	0.3	
Antimony 125	U		0.123		U	GAM	U		0.103	U	-	0.2	
Cesium 134	U		0.072		U	GAM	U		0.063	U	-	0.2	
Cesium 137	U		0.045	0.100	U	GAM	U		0.042	U	-	0.1	
Europium 152	U		<u>0.168</u>	0.100	U	GAM	U		<u>0.138</u>	U	-	0.3	
Europium 154	U		<u>0.164</u>	0.100	U	GAM	U		<u>0.116</u>	U	-	0.5	
Europium 155	U		<u>0.170</u>	0.100	U	GAM	U		<u>0.137</u>	U	-	0.3	
Niobium 94	U		0.043		U	GAM	U		0.038	U	-	0.2	
Radium 226	0.458	0.11	0.111			GAM	0.463	0.094	0.093		1	49	0.1
Radium 228	0.665	0.25	0.243			GAM	0.554	0.17	0.175		18	76	0.7
Sodium 22	U		0.056		U	GAM	U		0.040	U	-	0.5	

216-B-55 Supplemental Characterization

**DUPLICATES**

Page 1

**SUMMARY DATA SECTION**

Page 12

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000016

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3743

7099-006

B1VDM1

DUPLICATE, cont.

SDG <u>7099</u>		Client/Case no <u>Hanford</u>	<u>SDG H3743</u>
Contact <u>Melissa C. Mannion</u>		Contract <u>No. 33677</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>		
Lab sample id <u>R805181-06</u>	Lab sample id <u>R805181-01</u>	Client sample id <u>B1VDM1</u>	
Dept sample id <u>7099-006</u>	Dept sample id <u>7099-001</u>	Location/Matrix <u>C6743, I-001</u>	<u>SOLID</u>
	Received <u>05/22/08</u>	Collected/Weight <u>05/12/08 09:15</u>	<u>590 g</u>
% solids <u>93.2</u>	% solids <u>93.2</u>	Custody/SAF No <u>F08-031-150</u>	<u>F08-031</u>

QC-DUP#1 66013

DUPLICATES

Page 2

SUMMARY DATA SECTION

Page 13

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000017

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3743**

7099-001

B1VDM1

**D A T A   S H E E T**

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG <u>H3743</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R805181-01</u>	Client sample id <u>B1VDM1</u>	
Dept sample id <u>7099-001</u>	Location/Matrix <u>C6743, I-001</u>	<u>SOLID</u>
Received <u>05/22/08</u>	Collected/Weight <u>05/12/08 09:15</u>	<u>590 g</u>
% solids <u>93.2</u>	Custody/SAF No <u>F08-031-150</u>	<u>F08-031</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.946	1.6	2.63	400	U	H
Nickel 63	13981-37-8	2.50	1.9	3.10	30.0	U	NI_L
Total Strontium	SR-RAD	-0.019	0.15	0.325	1.00	U	SR
Technetium 99	14133-76-7	0.045	0.20	0.368	12.0	U	TC
Thorium 228	14274-82-9	0.453	0.28	0.348	1.00		TH
Thorium 230	14269-63-7	0.254	0.23	0.271	1.00	U	TH
Thorium 232	TH-232	0.707	0.29	0.216	1.00		TH
Uranium 233/234	U-233/234	0.263	0.18	0.224	1.00		U
Uranium 235	15117-96-1	0	0.071	0.271	1.00	U	U
Uranium 238	U-238	0.409	0.24	0.224	1.00		U
Neptunium 237	13994-20-2	-0.039	0.078	0.298	1.00	U	NP
Americium 241	14596-10-2	-0.013	0.11	0.206	1.00	U	AM
Plutonium 238	13981-16-3	-0.035	0.14	0.390	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.071	0.270	1.00	U	PU
Beryllium 7	13966-02-4	U		0.427		U	GAM
Potassium 40	13966-00-2	10.5	0.87	0.336			GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.394		U	GAM
Antimony 125	14234-35-6	U		0.103		U	GAM
Cesium 134	13967-70-9	U		0.063		U	GAM
Cesium 137	10045-97-3	U		0.042	0.100	U	GAM
Europium 152	14683-23-9	U		<u>0.138</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.116</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.137</u>	0.100	U	GAM
Niobium 94	14681-63-1	U		0.038		U	GAM
Radium 226	13982-63-3	0.463	0.094	0.093			GAM
Radium 228	15262-20-1	0.554	0.17	0.175			GAM
Sodium 22	13966-32-0	U		0.040		U	GAM

216-B-55 Supplemental Charactrization

**DATA SHEETS**  
Page 1  
**SUMMARY DATA SECTION**  
Page 14

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000018

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3743**

7099-002

B1VDR8

**DATA SHEET**

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG <u>H3743</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R805181-02</u>	Client sample id <u>B1VDR8</u>	
Dept sample id <u>7099-002</u>	Location/Matrix <u>C6743, I-002</u>	<u>SOLID</u>
Received <u>05/22/08</u>	Collected/Weight <u>05/12/08 10:45</u>	<u>620 g</u>
% solids <u>90.7</u>	Custody/SAF No <u>F08-031-156</u>	<u>F08-031</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.632	1.6	2.60	400	U	H
Nickel 63	13981-37-8	1.75	1.8	2.97	30.0	U	NI_L
Total Strontium	SR-RAD	0.200	0.18	0.327	1.00	U	SR
Technetium 99	14133-76-7	0.161	0.26	0.360	12.0	U	TC
Thorium 228	14274-82-9	0.299	0.27	0.367	1.00	U	TH
Thorium 230	14269-63-7	0.099	0.27	0.366	1.00	U	TH
Thorium 232	TH-232	0.331	0.27	0.254	1.00	U	TH
Uranium 233/234	U-233/234	0.145	0.097	0.123	1.00	U	U
Uranium 235	15117-96-1	0	0.039	0.149	1.00	U	U
Uranium 238	U-238	0.145	0.097	0.123	1.00	U	U
Neptunium 237	13994-20-2	0.153	<u>0.20</u>	0.154	1.00	U	NP
Americium 241	14596-10-2	0.062	0.25	0.598	1.00	U	AM
Plutonium 238	13981-16-3	-0.038	0.076	0.291	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.076	0.291	1.00	U	PU
Beryllium 7	13966-02-4	U		0.523		U	GAM
Potassium 40	13966-00-2	8.21	1.0	0.633			GAM
Cobalt 60	10198-40-0	U		<u>0.062</u>	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.493		U	GAM
Antimony 125	14234-35-6	U		0.125		U	GAM
Cesium 134	13967-70-9	U		0.070		U	GAM
Cesium 137	10045-97-3	U		0.056	0.100	U	GAM
Europium 152	14683-23-9	U		<u>0.140</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.212</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.136</u>	0.100	U	GAM
Niobium 94	14681-63-1	U		0.052		U	GAM
Radium 226	13982-63-3	0.418	0.11	0.118			GAM
Radium 228	15262-20-1	0.609	0.27	0.216			GAM
Sodium 22	13966-32-0	U		0.072		U	GAM

216-B-55 Supplemental Characterization

**DATA SHEETS**

Page 2

**SUMMARY DATA SECTION**

Page 15

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000019

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3743

7099-003

B1VDT1

DATA SHEET

SDG <u>7099</u>	Client/Case no <u>Hanford</u>	SDG <u>H3743</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R805181-03</u>	Client sample id <u>B1VDT1</u>	
Dept sample id <u>7099-003</u>	Location/Matrix <u>C6743, I-002-DUP</u>	<u>SOLID</u>
Received <u>05/22/08</u>	Collected/Weight <u>05/12/08 10:45</u>	<u>645 g</u>
% solids <u>91.7</u>	Custody/SAF No <u>F08-031-161</u>	<u>F08-031</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.913	1.8	3.03	400	U	H
Nickel 63	13981-37-8	1.04	1.9	3.21	30.0	U	NI_L
Total Strontium	SR-RAD	0.115	0.19	0.357	1.00	U	SR
Technetium 99	14133-76-7	0.075	0.13	0.363	12.0	U	TC
Thorium 228	14274-82-9	0.619	0.33	0.401	1.00		TH
Thorium 230	14269-63-7	0.358	0.26	0.312	1.00		TH
Thorium 232	TH-232	0.293	0.20	0.249	1.00		TH
Uranium 233/234	U-233/234	0.456	0.19	0.140	1.00		U
Uranium 235	15117-96-1	0.044	0.044	0.169	1.00	U	U
Uranium 238	U-238	0.329	0.15	0.140	1.00		U
Neptunium 237	13994-20-2	0.031	0.062	0.094	1.00	U	NP
Americium 241	14596-10-2	-0.049	0.20	0.471	1.00	U	AM
Plutonium 238	13981-16-3	0	0.096	0.264	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.048	0.183	1.00	U	PU
Beryllium 7	13966-02-4	U		0.663		U	GAM
Potassium 40	13966-00-2	8.26	2.6	0.727			GAM
Cobalt 60	10198-40-0	U		0.068	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.593		U	GAM
Antimony 125	14234-35-6	U		0.181		U	GAM
Cesium 134	13967-70-9	U		0.086		U	GAM
Cesium 137	10045-97-3	U		0.077	0.100	U	GAM
Europium 152	14683-23-9	U		0.196	0.100	U	GAM
Europium 154	15585-10-1	U		0.221	0.100	U	GAM
Europium 155	14391-16-3	U		0.200	0.100	U	GAM
Niobium 94	14681-63-1	U		0.062		U	GAM
Radium 226	13982-63-3	0.330	0.14	0.139			GAM
Radium 228	15262-20-1	0.418	0.27	0.286			GAM
Sodium 22	13966-32-0	U		0.076		U	GAM

216-B-55 Supplemental Charactrization

DATA SHEETS

Page 3

SUMMARY DATA SECTION

Page 16

Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/03/08</u>

00000020

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test AM Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

AMERICIUM 241 IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-	Americium	
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	241
Preparation batch 6150-098				
R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	U
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00

216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098			2σ prep error 8.0 %		Reference Lab Notebook #6150, pg. 98										
R805181-01		B1VDM1	0.206	0.500			25		801			43	06/24/08	06/24	SS-042
R805181-02		B1VDR8	0.598	0.500			31		112			45	06/24/08	06/26	SS-027
R805181-03		B1VDT1	0.471	0.500			40		109			44	06/24/08	06/25	SS-027
R805181-04		Lab Control Sample	0.349	0.500			51		110				06/24/08	06/25	SS-028
R805181-05		Method Blank	0.317	0.500			59		114				06/24/08	06/25	SS-031
R805181-06		Duplicate (R805181-01)	0.532	0.500			33		114			44	06/24/08	06/25	SS-032

Nominal values and limits from method 1.00 0.500 20-105 100 100 180

PROCEDURES REFERENCE AMCMISO\_IE\_PLATE\_AEA  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 CP-963 Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6  
 CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 0.412 ± 0.294  
 FOR 6 SAMPLES YIELD 40 ± 26

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

Page 17

00000021

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test NP Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

NEPTUNIUM IN SOLIDS  
 ALPHA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-	Neptunium	
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	237
Preparation batch 6150-098				
R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	U
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00  
 216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098 2σ prep error 14.8 % Reference Lab Notebook #6150, pg. 98															
R805181-01		B1VDM1	0.298	0.500			54		111			46	06/27/08	06/27	SS-035
R805181-02		B1VDR8	0.154	0.500			55		108			46	06/27/08	06/27	SS-040
R805181-03		B1VDT1	0.094	0.500			66		181			46	06/27/08	06/27	SS-037
R805181-04		Lab Control Sample	0.184	0.500			36		112				06/27/08	06/27	SS-038
R805181-05		Method Blank	0.286	0.500			29		112				06/27/08	06/27	SS-040
R805181-06		Duplicate (R805181-01)	0.140	0.500			50		112			46	06/27/08	06/27	SS-042
Nominal values and limits from method			1.00	0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-930	Neptunium from Solids and Water by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA	<u>0.193</u> ± <u>0.165</u>
FOR 6 SAMPLES	YIELD	<u>48</u> ± <u>27</u>

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000022

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test PU Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-		Plutonium	Plutonium	
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID	238	239/240

Preparation batch 6150-098

R805181-01			7099-001	B1VDM1	U	U
R805181-02			7099-002	B1VDR8	U	U
R805181-03			7099-003	B1VDT1	U	U
R805181-04			7099-004	Lab Control Sample	ok	ok
R805181-05			7099-005	Method Blank	U	U
R805181-06			7099-006	Duplicate (R805181-01)	- U	- U

Nominal values and limits from method RDLs (pCi/g) 1.00 1.00

216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

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

Preparation batch 6150-098 2σ prep error 8.0 % Reference Lab Notebook #6150, pg. 98

R805181-01			B1VDM1	0.390	0.500			60		115			44	06/24/08	06/25	SS-038
R805181-02			B1VDR8	0.291	0.500			60		115			44	06/24/08	06/25	SS-042
R805181-03			B1VDT1	0.264	0.500			66		138			44	06/24/08	06/25	SS-027
R805181-04			Lab Control Sample	0.192	0.500			74		138				06/24/08	06/25	SS-028
R805181-05			Method Blank	0.228	0.500			67		138				06/24/08	06/25	SS-031
R805181-06			Duplicate (R805181-01)	0.190	0.500			77		139			44	06/24/08	06/25	SS-032

Nominal values and limits from method 1.00 0.500 20-105 100 100 180

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 3	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.259 ± 0.151</u>
FOR 6 SAMPLES	YIELD <u>67 ± 14</u>

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 19

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000023

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test TH Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB RAW SUF-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 230

Preparation batch 6150-098

R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	0.358
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00

16-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

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

Preparation batch 6150-098 2σ prep error 8.0 % Reference Lab Notebook #6150, pg. 98

R805181-01			B1VDM1	0.348	0.250			81		226			36	06/17/08	06/17	SS-028
R805181-02			B1VDR8	0.367	0.250			74		226			36	06/17/08	06/17	SS-031
R805181-03			B1VDT1	0.401	0.250			73		226			36	06/17/08	06/17	SS-032
R805181-04			Lab Control Sample	0.263	0.250			81		225				06/17/08	06/17	SS-040
R805181-05			Method Blank	0.322	0.250			85		226				06/17/08	06/17	SS-042
R805181-06			Duplicate (R805181-01)	0.418	0.250			77		187			37	06/17/08	06/18	SS-040

Nominal values and limits from method 1.00 0.250 20-105 150 180

PROCEDURES REFERENCE THISO\_IE\_PLATE\_AEA  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 CP-900 Thorium in Water and Dissolved Solid Samples by  
 Extraction Chromatography, rev 1  
 CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 0.353 ± 0.112  
 FOR 6 SAMPLES YIELD 78 ± 9

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 20

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000024

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test U Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

URANIUM, ISOTOPIC IN SOLIDS  
 ALPHA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-		1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 6150-098										
R805181-01		7099-001	B1VDM1	0.263	U	0.409	64	58	0	17
R805181-02		7099-002	B1VDR8	0.145	U	0.145	100	95	0	27
R805181-03		7099-003	B1VDT1	0.456	U	0.329	139	86	13	15
R805181-04		7099-004	Lab Control Sample	ok	ok	ok				
R805181-05		7099-005	Method Blank	U	U	U				
R805181-06		7099-006	Duplicate (R805181-01)	ok	- U	ok	79	46	0	8
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	1.00	100		4
216-B-55 Supplemental Characterization							Averages	96		3

**METHOD PERFORMANCE**

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT	SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098      2σ prep error 8.0 %      Reference Lab Notebook #6150, pg. 98																
R805181-01			B1VDM1	0.271	0.500			94		<u>96</u>			37	06/17/08	06/18	SS-062
R805181-02			B1VDR8	0.149	0.500			102		182			36	06/17/08	06/17	SS-063
R805181-03			B1VDT1	0.169	0.500			93		139			36	06/17/08	06/17	SS-064
R805181-04			Lab Control Sample	0.857	0.500			<u>109</u>		108				06/17/08	06/17	SS-065
R805181-05			Method Blank	0.229	0.500			103		108				06/17/08	06/17	SS-066
R805181-06			Duplicate (R805181-01)	0.098	0.500			94		226			36	06/17/08	06/17	SS-027
Nominal values and limits from method				1.00	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	UIISO_PLATE_AEA
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 9	

AVERAGES ± 2 SD	MDA <u>0.296 ± 0.563</u>
FOR 6 SAMPLES	YIELD <u>99 ± 13</u>

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000025

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test SR Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 6150-098				
R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	U
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00

216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098			2σ prep error 10.4 % Reference Lab Notebook #6150, pg. 98												
R805181-01		B1VDM1	0.325	1.00			91		100			42	06/23/08	06/23	GRB-218
R805181-02		B1VDR8	0.327	1.00			91		100			42	06/23/08	06/23	GRB-223
R805181-03		B1VDT1	0.357	1.00			88		100			42	06/23/08	06/23	GRB-227
R805181-04		Lab Control Sample	0.308	1.00			83		100				06/23/08	06/23	GRB-225
R805181-05		Method Blank	0.330	1.00			84		100				06/23/08	06/23	GRB-202
R805181-06		Duplicate (R805181-01)	0.305	1.00			90		100			42	06/23/08	06/23	GRB-203

Nominal values and limits from method 1.00 1.00 30-105 100 180

PROCEDURES REFERENCE SRTOT\_SEP\_PRECIP\_GPC  
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5  
 CP-381 Strontium in Solids, rev 1

AVERAGES ± 2 SD MDA 0.325 ± 0.037  
 FOR 6 SAMPLES YIELD 88 ± 7

METHOD SUMMARIES

Page 6

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000026

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test TC Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

TECHNETIUM 99 IN SOLIDS  
 BETA COUNTING

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-	Technetium	
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	99
Preparation batch 6150-098				
R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	U
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 12.0  
 116-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098 2σ prep error 13.2 % Reference Lab Notebook #6150, pg. 98															
R805181-01		B1VDM1	0.368	1.00			93	100	42	06/18/08	06/23	GRB-220			
R805181-02		B1VDR8	0.360	1.00			95	100	40	06/18/08	06/21	GRB-220			
R805181-03		B1VDT1	0.363	1.00			95	100	42	06/18/08	06/23	GRB-222			
R805181-04		Lab Control Sample	0.368	1.00			94	100		06/18/08	06/21	GRB-222			
R805181-05		Method Blank	0.353	1.00			100	100		06/18/08	06/21	GRB-223			
R805181-06		Duplicate (R805181-01)	0.385	1.00			91	100	44	06/18/08	06/25	GRB-228			

Nominal values and limits from method 12.0 1.00 20-105 50 180

PROCEDURES	REFERENCE	TC99_TR_SEP_GPC
	SPP-062	Sample Aliquoting, rev 0
	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	<u>0.366</u> ± <u>0.022</u>
FOR 6 SAMPLES	YIELD	<u>95</u> ± <u>6</u>

METHOD SUMMARIES

Page 7

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000027

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test GAM Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 6150-098					
R805181-01		7099-001	B1VDM1	U	U
R805181-02		7099-002	B1VDR8	U	U
R805181-03		7099-003	B1VDT1	U	U
R805181-04		7099-004	Lab Control Sample	ok	ok
R805181-05		7099-005	Method Blank	U	U
R805181-06		7099-006	Duplicate (R805181-01)	- U	- U

Nominal values and limits from method RDLs (pCi/g) 0.050 0.100  
 216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098 2σ prep error 7.0 % Reference Lab Notebook #6150, pg. 98															
R805181-01		B1VDM1	<u>10.2</u>	222					146			30	06/04/08	06/11	JR,02,00
R805181-02		B1VDR8	<u>9.97</u>	259					148			30	06/04/08	06/11	JR,05,00
R805181-03		B1VDT1	<u>17.6</u>	254					105			30	06/04/08	06/11	JR,08,00
R805181-04		Lab Control Sample	<u>0.122</u>	220					105				06/04/08	06/11	JR,04,00
R805181-05		Method Blank	<u>25.4</u>	220					105				06/04/08	06/11	JR,06,00
R805181-06		Duplicate (R805181-01)	<u>11.2</u>	222					105			30	06/04/08	06/11	JR,02,00

Nominal values and limits from method 0.050 220 100 180

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

AVERAGES ± 2 SD MDA 12.4 ± 16.9  
 FOR 6 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000028

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Test H Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**RESULTS**

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Tritium
Preparation batch 6150-098				
R805181-01		7099-001	B1VDM1	U
R805181-02		7099-002	B1VDR8	U
R805181-03		7099-003	B1VDT1	U
R805181-04		7099-004	Lab Control Sample	ok
R805181-05		7099-005	Method Blank	U
R805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 400  
 216-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 6150-098 2σ prep error 10.0 % Reference Lab Notebook #6150, pg. 98													
R805181-01		B1VDM1	2.63	0.484			100	100				50 06/27/08 07/01	LSC-006
R805181-02		B1VDR8	2.60	0.491			100	100				50 06/27/08 07/01	LSC-006
R805181-03		B1VDT1	3.03	0.417			100	100				50 06/27/08 07/01	LSC-006
R805181-04		Lab Control Sample	3.35	0.400			100	100				06/27/08 07/01	LSC-006
R805181-05		Method Blank	3.09	0.400			100	100				06/27/08 07/01	LSC-006
R805181-06		Duplicate (R805181-01)	2.63	0.485			100	100				50 06/27/08 07/01	LSC-006

Nominal values and limits from method 400 0.400 25 180

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

AVERAGES ± 2 SD MDA 2.89 ± 0.626  
 FOR 6 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

Page 9

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000029

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3743

Client Hanford  
 Contract No. 33677  
 Contract SDG H3743

**LAB METHOD SUMMARY**

NICKEL 63 IN SOLIDS  
 LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID  
 SDG 7099  
 Contact Melissa C. Mannion

**RESULTS**

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63
Preparation batch 6150-098				
805181-01		7099-001	B1VDM1	U
805181-02		7099-002	B1VDR8	U
805181-03		7099-003	B1VDT1	U
805181-04		7099-004	Lab Control Sample	ok
805181-05		7099-005	Method Blank	U
805181-06		7099-006	Duplicate (R805181-01)	- U

Nominal values and limits from method RDLs (pCi/g) 30.0  
 16-B-55 Supplemental Characterization

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6150-098			2σ prep error 11.2 % Reference Lab Notebook #6150, pg. 98												
805181-01		B1VDM1	3.10	0.500			90		50			39	06/20/08	06/20	LSC-004
805181-02		B1VDR8	2.97	0.500			95		50			39	06/20/08	06/20	LSC-004
805181-03		B1VDT1	3.21	0.500			86		50			39	06/20/08	06/20	LSC-004
805181-04		Lab Control Sample	2.88	0.500			96		50				06/20/08	06/20	LSC-004
805181-05		Method Blank	2.89	0.500			96		50				06/20/08	06/20	LSC-004
805181-06		Duplicate (R805181-01)	3.10	0.500			90		50			39	06/20/08	06/20	LSC-004

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

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

AVERAGES ± 2 SD	MDA	<u>3.02</u> ± <u>0.265</u>
FOR 6 SAMPLES	YIELD	<u>92</u> ± <u>8</u>

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/03/08

00000030

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 27

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000031

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

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 Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 29

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000033

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 30

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000034

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

D A T A S H E E T

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 31

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000035

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
 Contract No. 33677  
 Case no SDG H3743

DATA SHEET

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

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000036

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

REPORT GUIDE

SDG 7099  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

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 33

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000037

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

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.

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 35

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000039

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 36

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000040

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 37

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000041

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

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'

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000042

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

GUIDE, cont.

SDG 7099  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3743

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 39

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 07/03/08

00000043

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 40

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000044

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3743

SDG 7099  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 33677  
Case no SDG\_H3743

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 41

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 07/03/08

00000045

<b>COLLECTOR</b> NCO Sampler <i>Kavac, Rosane, McIntyre</i>	<b>COMPANY CONTACT</b> TRENT, SJ	<b>TELEPHONE NO.</b> 373-5869	<b>PROJECT COORDINATOR</b> WIDRIG, DL	<b>PRICE CODE</b> 8N	<b>DATA TURNAROUND</b> 45 Days / 45 Days
<b>SAMPLING LOCATION</b> C6743, I-001	<b>PROJECT DESIGNATION</b> 216-B-55 Supplemental Characterization <i>H3743 (709A)</i>		<b>SAF NO.</b> F08-031	<b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b> <i>ERL-01-014</i>	<b>FIELD LOGBOOK NO.</b> <i>HOP-N-583-1 B1</i>	<b>ACTUAL SAMPLE DEPTH</b> <i>3.4 to 5.9'</i>	<b>COA</b> 123055ES30	<b>METHOD OF SHIPMENT</b> FEDERAL EXPRESS	
<b>SHIPPED TO</b> Eberline Services	<b>OFFSITE PROPERTY NO.</b> SEE PTR		<b>BILL OF LADING/AIR BILL NO.</b> SEE PTR <i>7905 0527 3450</i>		

<b>MATRIX*</b> A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)	<b>PRESERVATION</b>	None								
		<b>TYPE OF CONTAINER</b>	Square Bottle - Poly								
		<b>NO. OF CONTAINER(S)</b>	1								
		<b>VOLUME</b>	500mL								
<b>SPECIAL HANDLING AND/OR STORAGE</b> Radioactive Tie To: B1VDL8 or B1TFM2		<b>SAMPLE ANALYSIS</b>	SEE ITEM (1) IN SPECIAL INSTRUCTIONS								

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B1VDM1	SOIL	05-12-08	09:15	✓						

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM <i>Ed Kavac/Elaine J. Kent 5-12-08 1000</i>	RECEIVED BY/STORED IN <i>BBS site REF 5-12-08 1008</i>	** TestAmerica St Louis is the primary lab for all chemical analyses with the exception of Anions by method 300.0 ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. ** Analytical batch QC must be run on a sample associated with this SAF. (1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Niobium-94, Radium-226, Radium-228} Isotopic Uranium; Neptunium-237; Strontium-89,90 -- Total Sr; Isotopic Plutonium; Americium-241 {Americium-241} Tritium - H3; Technetium-99 {Technetium-99} Nickel-63; Isotopic Thorium {Thorium-232}
RELINQUISHED BY/REMOVED FROM <i>B-55 site Kent 5-12-08 0725</i>	RECEIVED BY/STORED IN <i>D. Parich O'Leary 5-13-08</i>	
RELINQUISHED BY/REMOVED FROM <i>D. Parich O'Leary 5-13-08</i>	RECEIVED BY/STORED IN <i>Fed Ex</i>	
RELINQUISHED BY/REMOVED FROM <i>Fed Ex</i>	RECEIVED BY/STORED IN <i>HWY 05/22/08 09:30</i>	
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	

<b>LABORATORY SECTION</b>	<b>RECEIVED BY</b>	<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>	<b>DISPOSAL METHOD</b>	<b>DISPOSED BY</b>	<b>DATE/TIME</b>

Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F08-031-156	PAGE 1 OF 1
<b>COLLECTOR</b> NCO Sampler <i>KAVIL/ROSANE, McINTYRE</i>		<b>COMPANY CONTACT</b> TRENT, SJ		<b>TELEPHONE NO.</b> 373-5869		<b>PROJECT COORDINATOR</b> WIDRIG, DL	
<b>SAMPLING LOCATION</b> C6743, I-002		<b>PROJECT DESIGNATION</b> 216-B-55 Supplemental Characterization		<b>SAF NO.</b> F08-031		<b>PRICE CODE</b> 8N <b>AIR QUALITY</b> <input type="checkbox"/>	
<b>ICE CHEST NO.</b> <i>ERC-01-014</i>		<b>FIELD LOGBOOK NO.</b> <i>HNF-N-583-1</i>		<b>ACTUAL SAMPLE DEPTH</b> <i>12.25' to 14.75'</i>		<b>COA</b> 123055J278	
<b>SHIPPED TO</b> Eberline Services		<b>OFFSITE PROPERTY NO.</b> SEE PTR		<b>BILL OF LADING/AIR BILL NO.</b> SEE PTR <i>7905 0527 3450</i>			
<b>MATRIX*</b> A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	<b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)		<b>PRESERVATION</b> None				
			<b>TYPE OF CONTAINER</b> Square Bottle - Poly				
			<b>NO. OF CONTAINER(S)</b> 1				
			<b>VOLUME</b> 500mL				
	<b>SPECIAL HANDLING AND/OR STORAGE</b> Radioactive Tie To: B1VDR5 or B1TFM3		<b>SAMPLE ANALYSIS</b>		SEE ITEM (1) IN SPECIAL INSTRUCTIONS		
<b>SAMPLE NO.</b>	<b>MATRIX*</b>	<b>SAMPLE DATE</b>	<b>SAMPLE TIME</b>				
B1VDR8	SOIL	<i>05-12-08</i>	<i>10:45</i>	<input checked="" type="checkbox"/>			
<b>CHAIN OF POSSESSION</b>		<b>SIGN/ PRINT NAMES</b>				<b>SPECIAL INSTRUCTIONS</b>	
RELINQUISHED BY/REMOVED FROM		DATE/TIME	RECEIVED BY/STORED IN		DATE/TIME	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.  ** Analytical batch QC must be run on a sample associated with this SAF. (1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Niobium-94, Radium-226, Radium-228} Isotopic Uranium; Neptunium-237; Strontium-89,90 -- Total Sr; Isotopic Plutonium; Americium-241 {Americium-241} Tritium - H3; Technetium-99 {Technetium-99} Nickel-63; Isotopic Thorium {Thorium-232}	
<i>Ed Kavil/...</i>		<i>5-12-08 11:40</i>	<i>B-55 Site Ref</i>		<i>5-12-08 11:40</i>		
<i>B-55 Site Ref</i>		<i>5-13-08</i>	<i>D. Paruch</i>		<i>5-13-08</i>		
<i>D. Paruch</i>		<i>5-13-08</i>	<i>Fed Ex</i>				
<i>Fed Ex</i>			<i>HPW</i>		<i>05/22/08 09:30</i>		
<b>LABORATORY SECTION</b>		<b>RECEIVED BY</b>				<b>TITLE</b>	<b>DATE/TIME</b>
<b>FINAL SAMPLE DISPOSITION</b>		<b>DISPOSAL METHOD</b>				<b>DISPOSED BY</b>	<b>DATE/TIME</b>

Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F08-031-161	PAGE 1 OF 1
COLLECTOR NCO Sampler <i>Kayce / Resane / McIntyre</i>		COMPANY CONTACT TRENT, SJ		TELEPHONE NO. 373-5869	PROJECT COORDINATOR WIDRIG, DL		PRICE CODE 8N DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C6743, I-002-DUP		PROJECT DESIGNATION 216-B-55 Supplemental Characterization <i>H3743 (7099)</i>			SAF NO. F08-031	AIR QUALITY <input type="checkbox"/>	45 Days / 45 Days
ICE CHEST NO. <i>ERC-01-014</i>		FIELD LOGBOOK NO. <i>Pg 2</i> <i>HUF-N-583-1</i>	ACTUAL SAMPLE DEPTH <i>12.15' to 14.75'</i>		COA 123055J278	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Eberline Services		OFFSITE PROPERTY NO. SEE PTR			BILL OF LADING/AIR BILL NO. SEE PTR <i>7905 0527 3456</i>		
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)		PRESERVATION None				
			TYPE OF CONTAINER Square Bottle - Poly				
			NO. OF CONTAINER(S) 1				
			VOLUME 500mL				
	SPECIAL HANDLING AND/OR STORAGE Radioactive Tie To: B1VDR5 or B1TFM3		SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS				
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B1VDT1	SOIL	<i>05-12-08</i>	<i>10:45</i>	<input checked="" type="checkbox"/>			
CHAIN OF POSSESSION		SIGN/ PRINT NAMES			SPECIAL INSTRUCTIONS		
RELINQUISHED BY/REMOVED FROM <i>SL KAON / Eberline Services</i>	DATE/TIME <i>05-12-08 1140</i>	RECEIVED BY/STORED IN <i>B-55 site Ref</i>	DATE/TIME <i>05-12-08 1140</i>	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.			
RELINQUISHED BY/REMOVED FROM <i>B-55 Site Ref</i>	DATE/TIME <i>5-13-08</i>	RECEIVED BY/STORED IN <i>D. Parham</i>	DATE/TIME <i>5-13-08</i>	** Analytical batch QC must be run on a sample associated with this SAF.			
RELINQUISHED BY/REMOVED FROM <i>D. Parham</i>	DATE/TIME <i>5-15-08</i>	RECEIVED BY/STORED IN <i>Fed Ex</i>	DATE/TIME	(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Niobium-94, Radium-226, Radium-228} Isotopic Uranium; Neptunium-237; Strontium-89,90 -- Total Sr; Isotopic Plutonium; Americium-241 {Americium-241} Tritium - H3; Technetium-99 {Technetium-99} Nickel-63; Isotopic Thorium {Thorium-232}			
RELINQUISHED BY/REMOVED FROM <i>Fed Ex</i>	DATE/TIME	RECEIVED BY/STORED IN <i>Thy</i>	DATE/TIME <i>05/22/08 09:30</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				
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME			
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME			



**RICHMOND, CA LABORATORY**  
SAMPLE RECEIPT CHECKLIST

*AK 5/22/08*

Client: F. HANFORD City MICHIGAN State WA  
 Date/Time received 05/22/08 09:30 CoC No. F08-031-150, 156, 161  
 Container I.D. No. ERC-01-019 Requested TAT (Days) 45 P.O. Received Yes [ ] No [  ]

**INSPECTION**

1. Custody seals on shipping container intact? Yes [  ] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [  ] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [  ] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [  ] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [  ]
6. Number of samples in shipping container: 3 Sample Matrix S
7. Number of containers per sample: 1 (Or see CoC         )
8. Samples are in correct container Yes [  ] No [ ]
9. Paperwork agrees with samples? Yes [  ] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [  ]
11. Samples are: In good condition [  ] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH          Preservative
13. Describe any anomalies:
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date
15. Inspected by AKW Date 05/22/08 Time: 11:30

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
<u>All Samples</u>	<u>460</u>						

Ion Chamber Ser. No.          Calibration date           
 Alpha Meter Ser. No.          Calibration date           
 Beta/Gamma Meter Ser. No. 113722 Calibration date 13 SEP 08