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**EBERLINE**  
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July 30, 2008

Mr. Steve Trent  
Fluor Hanford Inc.  
1200 Jadwin Avenue  
Richland, WA 99352Reference: **P.O. #33677**  
**Eberline Services R8-03-100-7063, SDG H3667**  
**R8-06-178-7063**

Dear Mr. Trent:

Enclosed is an updated data report for three solid (soil) samples designated under SAF No. F08-043 received at Eberline Services on March 20, 2008. Results were originally reported on May 2, this report includes results for Se-79.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/njv

Enclosure: Data Package

**RECEIVED**  
JAN 22 2009**EDMC**

**1.0 GENERAL**

Fluor Hanford Inc. (FH) Sample Delivery Group H3667 was composed of three solid (soil) samples designated under SAF No. F08-043 with a Project Designation of: 216-A-30 Crib Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies were noted on the Eberline Services Sample Receipt included in the original data package. Selenium-79 analysis was order after results for the originally requested analyses were reported.

**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 Selenium-79 Analysis**

The initial duplicate analysis results were not a good match and therefore a reanalysis was ordered. Just sample B1TH02 was reanalyzed (in duplicate) with a new QC blank sample (7063-11). No problems were encountered during the course of the reanalyses.

**2.4 Technetium-99 Analysis**

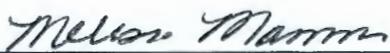
No problems were encountered during the course of the analyses.

**2.5 Isotopic Thorium Analysis**

No problems were encountered during the course of the analyses.

**3.0 Case Narrative Certification Statement**

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

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

  
\_\_\_\_\_  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3667

SDG 7063  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 33677  
Case no SDG\_H3667

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

T A B L E   O F   C O N T E N T S

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Prepared by

*Melissa Mannion*

Reviewed by

*Melissa Mannion*

Lab id EBRLNE  
Protocol Fluor  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 07/30/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG H3667

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

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SUMMARY DATA SECTION

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. 33677

Case no SDG\_H3667

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

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Lab id EBRLNE

Protocol Fluor

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 07/30/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

**LAB SAMPLE SUMMARY**

SDG 7063  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Case no SDG H3667

LAB						CHAIN OF	
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED
R803100-01	B1TH01	C5941, I-001	SOLID		F08-043	F08-043-146	03/04/08 13:50
R803100-02	B1TH02	C5941, I-002	SOLID		F08-043	F08-043-147	03/05/08 10:20
R803100-03	B1TH29	C5941, I-002-D	SOLID		F08-043	F08-043-148	03/05/08 10:20
R803100-04	Lab Control Sample		SOLID		F08-043		
R803100-05	Method Blank		SOLID		F08-043		
R803100-06	Duplicate (R803100-02)	C5941, I-002	SOLID		F08-043		03/05/08 10:20
R803100-08	Method Blank		SOLID		F08-043		
R803100-10	Method Blank		SOLID		F08-043		
R803100-11	Duplicate (R803100-02)	C5941, I-002	SOLID		F08-043		03/05/08 10:20

LAB SUMMARY

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 Protocol Fluor  
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 33677  
 Case no SDG H3667

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
7063	F08-043-146	B1TH01	SOLID	94.8	147 g		03/20/08 16	R803100-01		7063-001
	F08-043-147	B1TH02	SOLID	91.5	151 g		03/20/08 15	R803100-02		7063-002
	F08-043-148	B1TH29	SOLID	91.6	160 g		03/20/08 15	R803100-03		7063-003
		Method Blank	SOLID					R803100-05		7063-005
		Method Blank	SOLID					R803100-08		7063-008
		Method Blank	SOLID					R803100-10		7063-010
		Lab Control Sample	SOLID					R803100-04		7063-004
		Duplicate (R803100-02)	SOLID	91.5	151 g		03/20/08 15	R803100-06		7063-006
		Duplicate (R803100-02)	SOLID	91.5	151 g		03/20/08 15	R803100-11		7063-011

QC SUMMARY

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 33677  
 Case no SDG H3667

TEST	MATRIX	METHOD	PREPARATION ERROR			PLANCHETS ANALYZED			QUALI- FIERS
			BATCH	2σ %	CLIENT MORE	RE BLANK	LCS	DUP/ORIG MS/ORIG	
<b>Alpha Spectroscopy</b>									
TH	SOLID	Thorium, Isotopic in Solids	6145-169	8.0	3	1	1	1/1	
<b>Beta Counting</b>									
TC	SOLID	Technetium 99 in Solids	6145-169	13.2	3	1	1	1/1	
<b>Liquid Scintillation Counting</b>									
H	SOLID	Tritium in Solids	6145-169	10.0	3	1	1	1/1	
NI_L	SOLID	Nickel 63 in Solids	6145-169	11.2	3	1	1	1/1	
SE_L	SOLID	Selenium 79 in Solids	6145-169	11.2	3	2		1/1	

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

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

**LAB WORK SUMMARY**

Client Hanford  
 Contract No. 33677  
 Case no SDG H3667

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
R803100-01	B1TH01		7063-001	H		04/09/08	04/14/08	BW	Tritium in Solids	
03/04/08	C5941, I-001	SOLID	7063-001	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
03/20/08	F08-043-146	F08-043	7063-001	SE_L		07/09/08	07/15/08	BW	Selenium 79 in Solids	
			7063-001	TC		04/14/08	04/16/08	BW	Technetium 99 in Solids	
			7063-001	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-02	B1TH02		7063-002	H		04/09/08	04/14/08	BW	Tritium in Solids	
03/05/08	C5941, I-002	SOLID	7063-002	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
03/20/08	F08-043-147	F08-043	7063-002	SE_L	A1	07/25/08	07/29/08	BW	Selenium 79 in Solids	
			7063-002	TC		04/14/08	04/16/08	BW	Technetium 99 in Solids	
			7063-002	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-03	B1TH29		7063-003	H		04/09/08	04/14/08	BW	Tritium in Solids	
03/05/08	C5941, I-002-D	SOLID	7063-003	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
03/20/08	F08-043-148	F08-043	7063-003	SE_L		07/09/08	07/15/08	BW	Selenium 79 in Solids	
			7063-003	TC		04/14/08	04/16/08	BW	Technetium 99 in Solids	
			7063-003	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-04	Lab Control Sample		7063-004	H		04/09/08	04/14/08	BW	Tritium in Solids	
		SOLID	7063-004	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
		F08-043	7063-004	TC		04/14/08	04/16/08	BW	Technetium 99 in Solids	
			7063-004	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-05	Method Blank		7063-005	H		04/09/08	04/14/08	BW	Tritium in Solids	
		SOLID	7063-005	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
		F08-043	7063-005	TC		04/15/08	04/16/08	BW	Technetium 99 in Solids	
			7063-005	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-06	Duplicate (R803100-02)		7063-006	H		04/09/08	04/14/08	BW	Tritium in Solids	
03/05/08	C5941, I-002	SOLID	7063-006	NI_L		04/11/08	04/15/08	BW	Nickel 63 in Solids	
03/20/08		F08-043	7063-006	TC		04/14/08	04/16/08	BW	Technetium 99 in Solids	
			7063-006	TH		04/18/08	04/21/08	BW	Thorium, Isotopic in Solids	
R803100-08	Method Blank		7063-008	SE_L		07/09/08	07/15/08	BW	Selenium 79 in Solids	
		SOLID								
		F08-043								

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

**WORK SUMMARY, cont.**

SDG 7063  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 33677  
Case no SDG H3667

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION	MATRIX		SUF-						
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
R803100-10	Method Blank		7063-010	SE_L		07/25/08	07/29/08	BW	Selenium 79 in Solids	
		SOLID								
		F08-043								
R803100-11	Duplicate (R803100-02)		7063-011	SE_L		07/25/08	07/29/08	BW	Selenium 79 in Solids	
03/05/08	C5941, I-002	SOLID								
03/20/08		F08-043								

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
H	F08-043	Tritium in Solids	TRITIUM_COX_LSC	3			1	1	1	6
NI_L	F08-043	Nickel 63 in Solids	NI63_LSC	3			1	1	1	6
SE_L	F08-043	Selenium 79 in Solids	SE79_SEP_IE_LSC	3			2		1	6
TC	F08-043	Technetium 99 in Solids	TC99_TR_SEP_GPC	3			1	1	1	6
TH	F08-043	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	3			1	1	1	6
<b>TOTALS</b>				<b>15</b>			<b>6</b>	<b>4</b>	<b>5</b>	<b>30</b>

Lab id EBRLNE  
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Version 3.06  
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**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3667**

7063-005

Method Blank

**METHOD BLANK**

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R803100-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7063-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F08-043</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	2.60	3.4	5.56	400	U	H
Nickel 63	13981-37-8	0.661	1.5	2.48	30.0	U	NI_L
Technetium 99	14133-76-7	-0.170	0.18	0.664	12.0	U	TC
Thorium 228	14274-82-9	0.021	0.071	0.131	1.00	U	TH
Thorium 230	14269-63-7	0.156	0.13	0.227	1.00	U	TH
Thorium 232	TH-232	-0.028	0.028	0.078	1.00	U	TH

216-A-30 Crib Sampling

QC-BLANK #65173
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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>07/30/08</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3667

7063-008

Method Blank

METHOD BLANK

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	<u>SDG H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R803100-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7063-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F08-043</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 $\sigma$ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Selenium-79	15758-45-9	-0.151	2.0	3.36	10.0	U	SE_L

216-A-30 Crib Sampling

QC-BLANK #66278
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Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
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Report date <u>07/30/08</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3667

7063-010

Method Blank

METHOD BLANK

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	<u>SDG H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R803100-10</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7063-010</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>F08-043</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 $\sigma$ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Selenium-79	15758-45-9	0.765	0.85	1.39	10.0	U	SE_L

216-A-30 Crib Sampling

QC-BLANK #66569
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METHOD BLANKS  
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

7063-004

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7063</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG H3667</u> Contract No. <u>33677</u>
Lab sample id <u>R803100-04</u> Dept sample id <u>7063-004</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>F08-043</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	826	28	9.62	400	H	827	33	100	83-117	80-120
Nickel 63	216	5.8	2.48	30.0	NI_L	222	8.9	97	82-118	80-120
Technetium 99	103	2.4	0.522	12.0	TC	109	4.4	94	80-120	80-120
Thorium 230	38.5	1.7	0.220	1.00	TH	36.4	1.5	106	84-116	80-120

216-A-30 Crib Sampling

QC-LCS #65172

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
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 Version 3.06  
 Report date 07/30/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3667

7063-006

B1TH02

DUPLICATE

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R803100-06</u>	Lab sample id <u>R803100-02</u>	Client sample id <u>B1TH02</u>
Dept sample id <u>7063-006</u>	Dept sample id <u>7063-002</u>	Location/Matrix <u>C5941, I-002</u> SOLID
	Received <u>03/20/08</u>	Collected/Weight <u>03/05/08 10:20</u> <u>151 g</u>
% solids <u>91.5</u>	% solids <u>91.5</u>	Custody/SAF No <u>F08-043-147</u> <u>F08-043</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
Tritium	0.874	2.7	4.59	400	U	H	-0.615	2.7	4.66	U	-		0.8
Nickel 63	-0.461	1.8	3.12	30.0	U	NI_L	-0.987	1.8	3.18	U	-		0.4
Technetium 99	0.071	0.30	0.885	12.0	U	TC	0.030	0.19	0.606	U	-		0.2
Thorium 228	0.880	0.17	0.126	1.00		TH	0.806	0.16	0.152		9	45	0.6
Thorium 230	1.04	0.19	0.209	1.00		TH	1.05	0.20	0.201		1	43	0.1
Thorium 232	1.08	0.17	0.071	1.00		TH	0.818	0.15	0.059		28	40	2.1

216-A-30 Crib Sampling

QC-DUP#2 65174

DUPLICATES

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Protocol <u>Fluor</u>
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Form <u>DVD-DUP</u>
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

7063-011

B1TH02

**DUPLICATE**

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R803100-11</u>	Lab sample id <u>R803100-02</u>	Client sample id <u>B1TH02</u>
Dept sample id <u>7063-011</u>	Dept sample id <u>7063-002</u>	Location/Matrix <u>C5941, I-002</u> <b>SOLID</b>
	Received <u>03/20/08</u>	Collected/Weight <u>03/05/08 10:20</u> <u>151 g</u>
% solids <u>91.5</u>	% solids <u>91.5</u>	Custody/SAF No <u>F08-043-147</u> <u>F08-043</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
Selenium-79	1.65	1.5	2.51	10.0	U	SE_L	0.472	0.98	1.64	U	-	1.3	

216-A-30 Crib Sampling

QC-DUP#2 66570

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>07/30/08</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3667**

7063-001

B1TH01

**DATA SHEET**

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R803100-01</u>	Client sample id <u>B1TH01</u>	
Dept sample id <u>7063-001</u>	Location/Matrix <u>C5941, I-001</u>	<u>SOLID</u>
Received <u>03/20/08</u>	Collected/Weight <u>03/04/08 13:50</u>	<u>147 g</u>
% solids <u>94.8</u>	Custody/SAF No <u>F08-043-146</u>	<u>F08-043</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.211	2.8	4.79	400	U	H
Nickel 63	13981-37-8	1.05	1.6	2.63	30.0	U	NI_L
Selenium-79	15758-45-9	-1.66	2.1	3.62	10.0	U	SE_L
Technetium 99	14133-76-7	-0.037	0.19	0.642	12.0	U	TC
Thorium 228	14274-82-9	0.852	0.16	0.154	1.00		TH
Thorium 230	14269-63-7	0.952	0.18	0.200	1.00		TH
Thorium 232	TH-232	0.907	0.15	0.076	1.00		TH

216-A-30 Crib Sampling

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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>07/30/08</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3667**

7063-002

B1TH02

**DATA SHEET**

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R803100-02</u>	Client sample id <u>B1TH02</u>	
Dept sample id <u>7063-002</u>	Location/Matrix <u>C5941, I-002</u>	<u>SOLID</u>
Received <u>03/20/08</u>	Collected/Weight <u>03/05/08 10:20</u>	<u>151 g</u>
% solids <u>91.5</u>	Custody/SAF No <u>F08-043-147</u>	<u>F08-043</u>

ANALYTE	CAS NO	RESULT pCi/g	2 $\sigma$ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.615	2.7	4.66	400	U	H
Nickel 63	13981-37-8	-0.987	1.8	3.18	30.0	U	NI_L
Selenium-79	15758-45-9	0.472	0.98	1.64	10.0	U	SE_L
Technetium 99	14133-76-7	0.030	0.19	0.606	12.0	U	TC
Thorium 228	14274-82-9	0.806	0.16	0.152	1.00		TH
Thorium 230	14269-63-7	1.05	0.20	0.201	1.00		TH
Thorium 232	TH-232	0.818	0.15	0.059	1.00		TH

216-A-30 Crib Sampling

Lab id <u>EBRLINE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/30/08</u>

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3667**

7063-003

B1TH29

**D A T A   S H E E T**

SDG <u>7063</u>	Client/Case no <u>Hanford</u>	SDG <u>H3667</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R803100-03</u>	Client sample id <u>B1TH29</u>	
Dept sample id <u>7063-003</u>	Location/Matrix <u>C5941, I-002-D</u>	<u>SOLID</u>
Received <u>03/20/08</u>	Collected/Weight <u>03/05/08 10:20</u>	<u>160 g</u>
% solids <u>91.6</u>	Custody/SAF No <u>F08-043-148</u>	<u>F08-043</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-1.86	2.5	4.55	400	U	H
Nickel 63	13981-37-8	-0.308	1.7	2.97	30.0	U	NI_L
Selenium-79	15758-45-9	-1.96	2.2	3.82	10.0	U	SE_L
Technetium 99	14133-76-7	-0.040	0.17	0.578	12.0	U	TC
Thorium 228	14274-82-9	1.02	0.17	0.079	1.00		TH
Thorium 230	14269-63-7	1.02	0.19	0.212	1.00		TH
Thorium 232	TH-232	1.10	0.17	0.079	1.00		TH

216-A-30 Crib Sampling

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>07/30/08</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

Test TH Matrix SOLID

SDG 7063

Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford

Contract No. 33677

Contract SDG H3667

**RESULTS**

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

Preparation batch 6145-169

R803100-01	7063-001	B1TH01	0.952
R803100-02	7063-002	B1TH02	1.05
R803100-03	7063-003	B1TH29	1.02
R803100-04	7063-004	Lab Control Sample	ok
R803100-05	7063-005	Method Blank	U
R803100-06	7063-006	Duplicate (R803100-02)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00  
216-A-30 Crib Sampling

**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 6145-169 2σ prep error 8.0 % Reference Lab Notebook #6145, pg. 169

R803100-01	B1TH01	0.200	0.250	93	871	45	04/18/08	04/18	SS-055
R803100-02	B1TH02	0.201	0.250	90	871	44	04/18/08	04/18	SS-061
R803100-03	B1TH29	0.212	0.250	93	872	44	04/18/08	04/18	SS-064
R803100-04	Lab Control Sample	0.220	0.250	93	873		04/18/08	04/18	SS-065
R803100-05	Method Blank	0.227	0.250	91	874		04/18/08	04/18	SS-031
R803100-06	Duplicate (R803100-02)	0.209	0.250	93	874	44	04/18/08	04/18	SS-033

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

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 7	
CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1	
CP-008	Heavy Element Electroplating, rev 12	

AVERAGES ± 2 SD MDA 0.212 ± 0.021  
FOR 6 SAMPLES YIELD 92 ± 3

METHOD SUMMARIES

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Lab id EBRLNE

Protocol Fluor

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Report date 07/30/08

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

Test TC Matrix SOLID  
 SDG 7063  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford  
 Contract No. 33677  
 Contract SDG H3667

**RESULTS**

LAB	RAW	SUF-	Technetium	
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID
Preparation batch 6145-169				
R803100-01			7063-001	B1TH01
R803100-02			7063-002	B1TH02
R803100-03			7063-003	B1TH29
R803100-04			7063-004	Lab Control Sample
R803100-05			7063-005	Method Blank
R803100-06			7063-006	Duplicate (R803100-02)

Nominal values and limits from method      RDLs (pCi/g)      12.0  
 216-A-30 Crib 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/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6145-169      2σ prep error 13.2 %      Reference Lab Notebook #6145, pg. 169																	
R803100-01			B1TH01		0.642	1.00			84	50		41	04/10/08	04/14			GRB-221
R803100-02			B1TH02		0.606	1.00			86	50		40	04/10/08	04/14			GRB-222
R803100-03			B1TH29		0.578	1.00			91	50		40	04/10/08	04/14			GRB-223
R803100-04			Lab Control Sample		0.522	1.00			99	50			04/10/08	04/14			GRB-224
R803100-05			Method Blank		0.664	1.00			81	50			04/10/08	04/15			GRB-232
R803100-06			Duplicate (R803100-02)		0.885	1.00			75	50		40	04/10/08	04/14			GRB-226

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

PROCEDURES	REFERENCE	TC99_TR_SEP_GPC
CP-021		Preparation of Tc-99m Tracer, rev 4
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 12

AVERAGES ± 2 SD	MDA	<u>0.650</u> ± <u>0.251</u>
FOR 6 SAMPLES	YIELD	<u>86</u> ± <u>17</u>

Lab id EBRLNE  
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

**LAB METHOD SUMMARY**

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test H Matrix SOLID  
 SDG 7063  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 33677  
 Contract SDG H3667

**RESULTS**

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Tritium
Preparation batch 6145-169					
R803100-01		7063-001	B1TH01		U
R803100-02		7063-002	B1TH02		U
R803100-03		7063-003	B1TH29		U
R803100-04		7063-004	Lab Control Sample		ok
R803100-05		7063-005	Method Blank		U
R803100-06		7063-006	Duplicate (R803100-02)	-	U

Nominal values and limits from method RDLs (pCi/g) 400  
 216-A-30 Crib 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/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 6145-169 2σ prep error 10.0 % Reference Lab Notebook #6145, pg. 169															
R803100-01		B1TH01	4.79	0.353			100		50		36	04/08/08	04/09	LSC-007	
R803100-02		B1TH02	4.66	0.364			100		50		35	04/08/08	04/09	LSC-007	
R803100-03		B1TH29	4.55	0.366			100		50		35	04/08/08	04/09	LSC-007	
R803100-04		Lab Control Sample	9.62	0.300			100		<u>18</u>			04/08/08	04/09	LSC-007	
R803100-05		Method Blank	5.56	0.300			100		50			04/08/08	04/09	LSC-007	
R803100-06		Duplicate (R803100-02)	4.59	0.364			100		50		35	04/08/08	04/09	LSC-007	

Nominal values and limits from method 400 0.300 25 180

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

AVERAGES ± 2 SD MDA 5.63 ± 3.98  
 FOR 6 SAMPLES YIELD 100 ± 0

Lab id EBRLNE  
 Protocol Fluor  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 07/30/08



**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3667

**LAB METHOD SUMMARY**

SELENIUM 79 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test SE L Matrix SOLID

SDG 7063

Contact Melissa C. Mannion

Client Hanford

Contract No. 33677

Contract SDG H3667

**RESULTS**

LAB RAW SUP-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Selenium-79

Preparation batch 6145-169

R803100-01			7063-001	B1TH01	U
R803100-02	A1		7063-002	B1TH02	U
R803100-03			7063-003	B1TH29	U
R803100-08			7063-008	Method Blank	U
R803100-10			7063-010	Method Blank	U
R803100-11			7063-011	Duplicate (R803100-02)	- U

Nominal values and limits from method RDLs (pCi/g) 10.0  
216-A-30 Crib Sampling

**METHOD PERFORMANCE**

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

Preparation batch 6145-169 2σ prep error 11.2 % Reference Lab Notebook #6145, pg. 169

R803100-01			B1TH01	3.62	0.500				72	50	127	07/02/08	07/09	LSC-004
R803100-02	A1		B1TH02	1.64	0.500				81	100	142	07/23/08	07/25	LSC-005
R803100-03			B1TH29	3.82	0.500				68	50	126	07/02/08	07/09	LSC-004
R803100-08			Method Blank	3.36	0.500				78	50		07/02/08	07/09	LSC-004
R803100-10			Method Blank	1.39	0.500				94	100		07/23/08	07/25	LSC-005
R803100-11			Duplicate (R803100-02)	2.51	0.500				51	100	142	07/23/08	07/25	LSC-005

Nominal values and limits from method 10.0 0.500 20-105 50 180

PROCEDURES REFERENCE SE79\_SEP\_IE\_LSC  
SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 7  
RP-340 Selenium-79 in Solids and Water, rev 0

AVERAGES ± 2 SD MDA 2.72 ± 2.08  
FOR 6 SAMPLES YIELD 74 ± 29

METHOD SUMMARIES

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG H3667

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.

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SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3667

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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 Report date 07/30/08

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 33677  
Case no SDG\_H3667

WORK SUMMARY

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

The following notes apply to this report:

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

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
 Contract No. 33677  
 Case no SDG\_H3667

DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3667

SDG 7063  
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
 Contract No. 33677  
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DATA SHEET

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

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

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

The following values are underlined to indicate possible problems:

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

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SAMPLE DELIVERY GROUP H3667

SDG 7063  
Contact Melissa C. Mannion

GUIDE , cont .

Client Hanford  
Contract No. 33677  
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DATA SHEET

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

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SDG 7063  
Contact Melissa C. Mannion

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

- \* The second limit for the RPD is the larger of:
  1. A fixed percentage specified in the protocol.

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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.

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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

MDAs are underlined if greater than the printed RDL.

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

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

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

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

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

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

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

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

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

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

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

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Fluor Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F08-043-154	PAGE 1 OF 1
COLLECTOR NCO Sampler <i>POPE</i>	COMPANY CONTACT TRENT, SJ	TELEPHONE NO. 373-5869	PROJECT COORDINATOR WIDRIG, DL		PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days	
SAMPLING LOCATION C5941, I-002	PROJECT DESIGNATION 216-A-30 Ctb Sampling		SAF NO. F08-043		AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO. <i>GRP-07-008</i>	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH <i>4.8' - 6.3'</i>	COA 123215E520		METHOD OF SHIPMENT FEDERAL EXPRESS		
SHIPPED TO Lionville Laboratory incorporated	OFFSITE PROPERTY NO. SEE PTR	BILL OF LADING/AIR BILL NO. SEE PTR <i>7909 6474 0407</i>					
MATRIX* A=Air DL=Drum L=Liquid DS=Drum S=Sol SE=Sediment T=Tissue V=Vegetation W=Water Wt=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)  <i>SD Cont #3667</i>	PRESERVATION Cool-8C	TYPE OF CONTAINER G	NO. OF CONTAINER(S) 1	VOLUME 120ml	SPECIAL HANDLING AND/OR STORAGE Radioactive tie to B1TD85	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B1TH28	SOIL	<i>3-5-08</i>	<i>1020</i>				
				<i>Lot# 024875</i>			
CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM <i>S.S. POPE</i>	DATE/TIME <i>3-5-08 1142</i>	RECEIVED BY/STORED IN <i>Site Room Frige</i>	DATE/TIME <i>3-5-08 1142</i>	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.  <i>#3667</i>			
RELINQUISHED BY/REMOVED FROM <i>M. OSO'S</i>	DATE/TIME <i>3/7/08 1230</i>	RECEIVED BY/STORED IN <i>[Signature]</i>	DATE/TIME <i>3/7/08 1230</i>				
RELINQUISHED BY/REMOVED FROM <i>[Signature]</i>	DATE/TIME <i>3/7/08 1500</i>	RECEIVED BY/STORED IN <i>M0745-REF #1</i>	DATE/TIME <i>3/7/08 1500</i>				
RELINQUISHED BY/REMOVED FROM <i>MD 745 Ref #1</i>	DATE/TIME <i>3-19-08 0900</i>	RECEIVED BY/STORED IN <i>Fluor Hanford</i>	DATE/TIME <i>3-19-08</i>				
RELINQUISHED BY/REMOVED FROM <i>D. E. PARCHEN</i>	DATE/TIME <i>3-19-08</i>	RECEIVED BY/STORED IN <i>Fed Ex</i>	DATE/TIME <i>3-20-08 0940</i>				
RELINQUISHED BY/REMOVED FROM <i>[Signature]</i>	DATE/TIME <i>3-20-08 0940</i>	RECEIVED BY/STORED IN <i>[Signature]</i>	DATE/TIME <i>3-20-08 0940</i>				
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME			
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME			

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