



RECEIVED OCTOBER 9, 2008

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SERVICES

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October 9, 2008

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

Reference: **P.O. #33677**
Eberline Services R8-07-166-7158, SDG H3809

Dear Mr. Trent:

Enclosed is a data report for one solid (soil) sample designated under SAF No. F08-126 received at Eberline Services on July 25, 2008. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

For Melissa C. Mannion
Senior Program Manager

NJV

Enclosure: *Data Package*

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3809 was composed of one solid (soil) sample designated under SAF No. F08-126 with a Project Designation of: 216-A-5 Crib Characterization Sampling and Analysis-Soil.

The sample was received as stated on the Chain-of-Custody document. 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 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Selenium-79 Analysis

Eberline Services does not have a stock of Se-79 activity with which to prepare control samples, as a consequence an LCS was not performed. No problems were encountered during the course of the analyses.

2.5 Strontium-90 Analysis

No problems were encountered during the course of the analyses.

2.6 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.7 Iodine-129 Analysis

No problems were encountered during the course of the analyses.

2.8 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.9 Protactinium-231 Analysis

The sample planchet and the QC LCS planchet required a rework due to low initial yields. The Pa-231 QC LCS recovery was 125%, greater than the upper control limit of 120%. No other problems were encountered during the course of the analyses.

2.10 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.11 Neptunium-237 Analysis

No problems were encountered during the course of the reanalyses.

2.12 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.13 Americium-241 Analysis

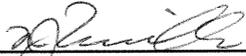
Due to very low initial tracer yields for the QC blank and duplicate analysis and failed reworks of those planchets the samples were realiquoted and reanalyzed. No problems were encountered during the course of the reanalyses.

2.14 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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



Melissa C. Mannion
Senior Program Manager

10/9/08

Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3809

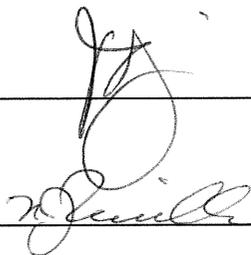
SDG 7158
Contact Melissa C. Mannion

Client Hanford
Contract No. 33677
Case no SDG_H3809

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

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Prepared by



Reviewed by

Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 10/09/08

SDG 7158
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG_H3809

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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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3809

SDG 7158
Contact Melissa C. Mannion

GUIDE , cont .

Client Hanford
Contract No. 33677
Case no SDG H3809

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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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford
 Contract No. 33677
 Case no SDG H3809

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R807166-01	B1WBLO	C6552 ASS-001	SOLID		F08-126	F08-126-119	07/21/08 12:39
R807166-02	Lab Control Sample		SOLID		F08-126		
R807166-03	Method Blank		SOLID		F08-126		
R807166-04	Duplicate (R807166-01)	C6552 ASS-001	SOLID		F08-126		07/21/08 12:39
R807166-05	Lab Control Sample		SOLID		F08-126		
R807166-06	Method Blank		SOLID		F08-126		
R807166-07	Duplicate (R807166-01)	C6552 ASS-001	SOLID		F08-126		07/21/08 12:39

LAB SUMMARY

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SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Case no SDG H3809

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL. SAMPLE ID	DEPARTMENT SAMPLE ID
7158	F08-126-119	B1WBL0	SOLID	92.1	678 g		07/25/08 4	R807166-01	7158-001
		Method Blank	SOLID					R807166-03	7158-003
		Method Blank	SOLID					R807166-06	7158-006
		Lab Control Sample	SOLID					R807166-02	7158-002
		Lab Control Sample	SOLID					R807166-05	7158-005
		Duplicate (R807166-01)	SOLID	92.1	678 g		07/25/08 4	R807166-04	7158-004
		Duplicate (R807166-01)	SOLID	92.1	678 g		07/25/08 4	R807166-07	7158-007

QC SUMMARY

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SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 33677
 Case no SDG H3809

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALIFIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
AM	SOLID	Americium 241 in Solids	6157-143	8.0	1			1	1	1/1
NP	SOLID	Neptunium in Solids	6157-143	14.8	1			1	1	1/1
PA	SOLID	Pa 231 in Solids	6157-143	14.8	1			1	1	1/1
PU	SOLID	Plutonium, Isotopic in Solids	6157-143	8.0	1			1	1	1/1
TH	SOLID	Thorium, Isotopic in Solids	6157-143	8.0	1			1	1	1/1
U	SOLID	Uranium, Isotopic in Solids	6157-143	8.0	1			1	1	1/1
Beta Counting										
SR	SOLID	Total Strontium in Solids	6157-143	10.4	1			1	1	1/1
TC	SOLID	Technetium 99 in Solids	6157-143	13.2	1			1	1	1/1
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	6157-143	7.0	1			1	1	1/1
I	SOLID	Iodine 129 in Solids	6157-143	19.4	1			1	1	1/1
Liquid Scintillation Counting										
C	SOLID	Carbon 14 in Solids	6157-143	10.0	1			1	1	1/1
H	SOLID	Tritium in Solids	6157-143	10.0	1			1	1	1/1
NI_L	SOLID	Nickel 63 in Solids	6157-143	11.2	1			1	1	1/1
SE_L	SOLID	Selenium 79 in Solids	6157-143	11.2	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.

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SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford
 Contract No. 33677
 Case no SDG H3809

LAB SAMPLE	CLIENT SAMPLE ID					SUF-					
COLLECTED	LOCATION		MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No		PLANCHET	TEST						
R807166-01	B1WBLO			7158-001	AM	A1	10/08/08	10/09/08	BW	Americium 241 in Solids	
07/21/08	C6552 ASS-001		SOLID	7158-001	C		09/03/08	09/08/08	BW	Carbon 14 in Solids	
07/25/08	F08-126-119	F08-126		7158-001	GAM		08/14/08	08/19/08	MWT	Gamma Scan	
				7158-001	H		09/04/08	09/09/08	BW	Tritium in Solids	
				7158-001	I		09/19/08	09/23/08	BW	Iodine 129 in Solids	
				7158-001	NI_L		09/10/08	09/12/08	BW	Nickel 63 in Solids	
				7158-001	NP		09/22/08	09/23/08	BW	Neptunium in Solids	
				7158-001	PA	R1	09/17/08	10/09/08	BW	Pa 231 in Solids	
				7158-001	PU		09/22/08	09/23/08	BW	Plutonium, Isotopic in Solids	
				7158-001	SE_L		09/19/08	09/25/08	BW	Selenium 79 in Solids	
				7158-001	SR		09/12/08	09/18/08	BW	Total Strontium in Solids	
				7158-001	TC		09/08/08	09/09/08	BW	Technetium 99 in Solids	
				7158-001	TH		09/19/08	09/23/08	BW	Thorium, Isotopic in Solids	
				7158-001	U		09/06/08	09/08/08	BW	Uranium, Isotopic in Solids	
R807166-02	Lab Control Sample			7158-002	C		09/03/08	09/08/08	BW	Carbon 14 in Solids	
			SOLID	7158-002	GAM		08/14/08	08/19/08	MWT	Gamma Scan	
		F08-126		7158-002	H		09/04/08	09/09/08	BW	Tritium in Solids	
				7158-002	I		09/19/08	09/23/08	BW	Iodine 129 in Solids	
				7158-002	NI_L		09/10/08	09/12/08	BW	Nickel 63 in Solids	
				7158-002	NP		09/22/08	09/23/08	BW	Neptunium in Solids	
				7158-002	PA	R1	09/17/08	10/09/08	BW	Pa 231 in Solids	
				7158-002	PU		09/22/08	09/23/08	BW	Plutonium, Isotopic in Solids	
				7158-002	SR		09/12/08	09/18/08	BW	Total Strontium in Solids	
				7158-002	TC		09/06/08	09/09/08	BW	Technetium 99 in Solids	
				7158-002	TH		09/17/08	09/23/08	BW	Thorium, Isotopic in Solids	
				7158-002	U		09/06/08	09/08/08	BW	Uranium, Isotopic in Solids	

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SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Case no SDG H3809

WORK SUMMARY, cont.

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
R807166-03	Method Blank		7158-003	C		09/03/08	09/08/08	BW	Carbon 14 in Solids	
		SOLID	7158-003	GAM		08/14/08	08/19/08	MWT	Gamma Scan	
		F08-126	7158-003	H		09/04/08	09/09/08	BW	Tritium in Solids	
			7158-003	I		09/19/08	09/23/08	BW	Iodine 129 in Solids	
			7158-003	NI_L		09/10/08	09/12/08	BW	Nickel 63 in Solids	
			7158-003	NP		09/22/08	09/23/08	BW	Neptunium in Solids	
			7158-003	PA		09/17/08	10/09/08	BW	Pa 231 in Solids	
			7158-003	PU		09/22/08	09/23/08	BW	Plutonium, Isotopic in Solids	
			7158-003	SE_L		09/19/08	09/25/08	BW	Selenium 79 in Solids	
			7158-003	SR		09/12/08	09/18/08	BW	Total Strontium in Solids	
			7158-003	TC		09/08/08	09/09/08	BW	Technetium 99 in Solids	
			7158-003	TH		09/18/08	09/23/08	BW	Thorium, Isotopic in Solids	
			7158-003	U		09/06/08	09/08/08	BW	Uranium, Isotopic in Solids	
R807166-04	Duplicate (R807166-01)		7158-004	C		09/03/08	09/08/08	BW	Carbon 14 in Solids	
07/21/08	C6552 ASS-001	SOLID	7158-004	GAM		08/14/08	08/19/08	MWT	Gamma Scan	
07/25/08		F08-126	7158-004	H		09/04/08	09/09/08	BW	Tritium in Solids	
			7158-004	I		09/19/08	09/23/08	BW	Iodine 129 in Solids	
			7158-004	NI_L		09/10/08	09/12/08	BW	Nickel 63 in Solids	
			7158-004	NP		09/22/08	09/23/08	BW	Neptunium in Solids	
			7158-004	PA		09/17/08	10/09/08	BW	Pa 231 in Solids	
			7158-004	PU		09/22/08	09/23/08	BW	Plutonium, Isotopic in Solids	
			7158-004	SE_L		09/19/08	09/25/08	BW	Selenium 79 in Solids	
			7158-004	SR		09/12/08	09/18/08	BW	Total Strontium in Solids	
			7158-004	TC		09/08/08	09/09/08	BW	Technetium 99 in Solids	
			7158-004	TH		09/18/08	09/23/08	BW	Thorium, Isotopic in Solids	
			7158-004	U		09/06/08	09/08/08	BW	Uranium, Isotopic in Solids	
R807166-05	Lab Control Sample		7158-005	AM		10/08/08	10/09/08	BW	Americium 241 in Solids	
		SOLID								
		F08-126								
R807166-06	Method Blank		7158-006	AM		10/08/08	10/09/08	BW	Americium 241 in Solids	
		SOLID								
		F08-126								
R807166-07	Duplicate (R807166-01)		7158-007	AM		10/08/08	10/09/08	BW	Americium 241 in Solids	
07/21/08	C6552 ASS-001	SOLID								
07/25/08		F08-126								

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

SDG 7158

Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford

Contract No. 33677

Case no SDG H3809

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	F08-126	Americium 241 in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
C	F08-126	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1	4
GAM	F08-126	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	F08-126	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1	4
I	F08-126	Iodine 129 in Solids	I129_SEP_LEPS_GS	1			1	1	1	4
NI_L	F08-126	Nickel 63 in Solids	NI63_LSC	1			1	1	1	4
NP	F08-126	Neptunium in Solids	NP237_LLE_PLATE_AEA	1			1	1	1	4
PA	F08-126	Pa 231 in Solids	PA231_IE_PLATE_AEA	1			1	1	1	4
PU	F08-126	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SE_L	F08-126	Selenium 79 in Solids	SE79_SEP_IE_LSC	1			1		1	3
SR	F08-126	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	F08-126	Technetium 99 in Solids	TC99_TR_SEP_GPC	1			1	1	1	4
TH	F08-126	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	1			1	1	1	4
U	F08-126	Uranium, Isotopic in Solids	UIISO_PLATE_AEA	1			1	1	1	4
TOTALS				14			14	13	14	55

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SAMPLE DELIVERY GROUP H3809

7158-003

Method Blank

METHOD BLANK

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	SDG <u>H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R807166-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7158-003</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>F08-126</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.996	2.5	4.18	400	U	H
Carbon 14	14762-75-5	-1.13	2.0	3.47	50.0	U	C
Nickel 63	13981-37-8	0.446	1.5	2.56	30.0	U	NI_L
Selenium-79	15758-45-9	-0.461	2.4	4.12	10.0	U	SE_L
Total Strontium	SR-RAD	-0.043	0.14	0.293	1.00	U	SR
Technetium 99	14133-76-7	0.056	0.14	0.375	12.0	U	TC
Iodine 129	15046-84-1	0.028	0.33	0.738	2.00	U	I
Thorium 228	14274-82-9	-0.015	0.12	0.254	1.00	U	TH
Thorium 230	14269-63-7	0	0.090	0.143	1.00	U	TH
Thorium 232	TH-232	-0.030	0.030	0.115	1.00	U	TH
Uranium 233/234	U-233/234	0.020	0.041	0.156	1.00	U	U
Uranium 235	15117-96-1	0	0.049	0.189	1.00	U	U
Uranium 238	U-238	0	0.041	0.156	1.00	U	U
Neptunium 237	13994-20-2	0	0.082	0.123	1.00	U	NP
Plutonium 238	13981-16-3	-0.024	0.067	0.131	1.00	U	PU
Plutonium 239/240	PU-239/240	-0.039	0.039	0.089	1.00	U	PU
Protactinium 231	14331-85-2	0.101	0.14	0.259	1.00	U	PA
Tin 126	15832-50-5	U		0.031		U	GAM
Beryllium 7	13966-02-4	U		0.175		U	GAM
Potassium 40	13966-00-2	U		0.664		U	GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.187		U	GAM
Antimony 125	14234-35-6	U		0.062		U	GAM
Cesium 134	13967-70-9	U		0.032		U	GAM
Cesium 137	10045-97-3	U		0.024	0.100	U	GAM
Europium 152	14683-23-9	U		0.068	0.100	U	GAM
Europium 154	15585-10-1	U		0.083	0.100	U	GAM
Europium 155	14391-16-3	U		0.056	0.100	U	GAM
Niobium 94	14681-63-1	U		0.023		U	GAM

216A5 Crib Charactrztn Samp&Ana-Soil

METHOD BLANKS
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Protocol <u>Fluor</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3809

7158-003

Method Blank

B L A N K , c o n t .

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	SDG <u>H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R807166-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7158-003</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>F08-126</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Radium 226	13982-63-3	U		0.056		U	GAM
Radium 228	15262-20-1	U		0.118		U	GAM

216A5 Crib Charactrztn Samp&Ana-Soil

QC-BLANK #66725

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>10/09/08</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3809

7158-006

Method Blank

M E T H O D B L A N K

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	<u>SDG_H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R807166-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7158-006</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>F08-126</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Americium 241	14596-10-2	0.066	0.20	0.363	1.00	U	AM

216A5 Crib Charactrztn Samp&Ana-Soil

QC-BLANK #67521

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>10/09/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

7158-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7158</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H3809</u> Contract <u>No. 33677</u>
Lab sample id <u>R807166-02</u> Dept sample id <u>7158-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>F08-126</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Tritium	600	27	9.32	400	H	605	24	99	83-117	80-120
Carbon 14	1310	14	3.60	50.0	C	1600	64	<u>82</u>	86-114	80-120
Nickel 63	209	5.7	2.52	30.0	NI_L	220	8.8	95	83-117	80-120
Total Strontium	9.16	0.38	0.162	1.00	SR	9.26	0.37	99	82-118	80-120
Technetium 99	101	1.7	0.486	12.0	TC	109	4.4	93	81-119	80-120
Iodine 129	125	2.4	<u>2.07</u>	2.00	I	116	4.6	108	68-132	80-120
Thorium 230	35.3	1.4	0.104	1.00	TH	37.8	1.5	93	86-114	80-120
Uranium 233/234	19.3	1.7	0.748	1.00	U	18.6	0.74	104	81-119	80-120
Uranium 235	14.9	1.5	0.154	1.00	U	15.1	0.60	99	80-120	80-120
Uranium 238	20.5	1.8	0.713	1.00	U	20.2	0.81	102	81-119	80-120
Neptunium 237	23.0	3.9	0.114	1.00	NP	19.8	0.79	116	60-140	80-120
Plutonium 238	22.6	1.0	0.122	1.00	PU	23.4	0.94	97	85-115	80-120
Plutonium 239/240	25.8	1.2	0.078	1.00	PU	26.4	1.1	98	85-115	80-120
Protactinium 231	5.66	1.2	0.290	1.00	PA	4.54	0.18	<u>125</u>	51-149	80-120
Cobalt 60	0.728	0.067	0.038	0.050	GAM	0.763	0.031	95	82-118	80-120
Cesium 137	0.938	0.063	0.043	0.100	GAM	0.844	0.034	111	83-117	80-120

216A5 Crib Charactrzttn Samp&Ana-Soil

QC-LCS #66724

Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 10/09/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

7158-005

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7158</u>	Client/Case no <u>Hanford</u> <u>SDG H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>
Lab sample id <u>R807166-05</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7158-005</u>	Material/Matrix <u>SOLID</u>
	SAF No <u>F08-126</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
Americium 241	20.3	3.1	0.482	1.00	AM		20.4	0.82	100	74-126	80-120

216A5 Crib Charactrzttn Samp&Ana-Soil

QC-LCS #67520

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>10/09/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

7158-004

B1WBLO

DUPLICATE

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	SDG <u>H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R807166-04</u>	Lab sample id <u>R807166-01</u>	Client sample id <u>B1WBLO</u>
Dept sample id <u>7158-004</u>	Dept sample id <u>7158-001</u>	Location/Matrix <u>C6552 ASS-001</u> <u>SOLID</u>
	Received <u>07/25/08</u>	Collected/Weight <u>07/21/08 12:39</u> <u>678 g</u>
% solids <u>92.1</u>	% solids <u>92.1</u>	Custody/SAF No <u>F08-126-119</u> <u>F08-126</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	TEST	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	σ
Tritium	20.7	3.2	3.77	400		H	21.9	3.2	3.79		6	38	0.4
Carbon 14	5.57	2.0	3.14	50.0		C	5.12	2.0	3.15		8	82	0.3
Nickel 63	1.48	1.9	3.08	30.0	U	NI_L	1.37	1.6	2.61	U	-		0.1
Selenium-79	1.44	2.2	3.68	10.0	U	SE_L	1.18	2.0	3.41	U	-		0.2
Total Strontium	68.4	1.4	0.262	1.00		SR	68.6	1.7	0.356		0	23	0
Technetium 99	0.400	0.17	0.339	12.0		TC	0.070	0.14	0.354	U	140	145	2.9
Iodine 129	1.06	0.94	<u>2.14</u>	2.00	U	I	0.634	1.4	<u>3.19</u>	U	-		0.5
Thorium 228	0.919	0.30	0.303	1.00		TH	0.941	0.18	0.154		2	59	0.1
Thorium 230	0.618	0.26	0.207	1.00		TH	0.697	0.15	0.107		12	71	0.5
Thorium 232	0.862	0.27	0.143	1.00		TH	0.824	0.15	0.078		5	58	0.2
Uranium 233/234	0.789	0.24	0.151	1.00		U	0.812	0.26	0.138		3	68	0.1
Uranium 235	0.072	0.096	0.183	1.00	U	U	0.044	0.044	0.167	U	-		0.5
Uranium 238	0.710	0.24	0.151	1.00		U	0.957	0.26	0.138		30	66	1.3
Neptunium 237	0	0.070	0.106	1.00	U	NP	0.142	0.19	0.362	U	-		1.4
Plutonium 238	-0.035	0.091	0.164	1.00	U	PU	0.026	0.11	0.253	U	-		0.9
Plutonium 239/240	0.015	0.040	0.077	1.00	U	PU	0	0.053	0.202	U	-		0.5
Protactinium 231	0.205	0.21	0.328	1.00	U	PA	0.154	0.19	0.340	U	-		0.4
Tin 126	0.220	0.10	0.133			GAM	U		0.284	U	25	180	0.4
Beryllium 7	U		0.372		U	GAM	U		0.359	U	-		0.1
Potassium 40	17.3	1.1	0.329			GAM	18.0	1.0	0.257		4	20	0.6
Cobalt 60	U		0.042	0.050	U	GAM	U		0.035	U	-		0.3
Ruthenium 106	U		0.307		U	GAM	U		0.302	U	-		0
Antimony 125	U		0.089		U	GAM	U		0.084	U	-		0.1
Cesium 134	U		0.053		U	GAM	U		0.047	U	-		0.2
Cesium 137	U		0.039	0.100	U	GAM	U		0.036	U	-		0.1
Europium 152	U		0.093	0.100	U	GAM	U		0.091	U	-		0
Europium 154	U		<u>0.133</u>	0.100	U	GAM	U		<u>0.128</u>	U	-		0.1
Europium 155	U		<u>0.138</u>	0.100	U	GAM	U		<u>0.132</u>	U	-		0.1

216A5 Crib Charactrzttn Samp&Ana-Soil

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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>10/09/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

7158-004

B1WBLO

DUPLICATE, cont.

SDG <u>7158</u>		Client/Case no <u>Hanford</u> <u>SDG H3809</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>33677</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>R807166-04</u>	Lab sample id <u>R807166-01</u>	Client sample id <u>B1WBLO</u>
Dept sample id <u>7158-004</u>	Dept sample id <u>7158-001</u>	Location/Matrix <u>C6552 ASS-001</u> <u>SOLID</u>
	Received <u>07/25/08</u>	Collected/Weight <u>07/21/08 12:39</u> <u>678 g</u>
% solids <u>92.1</u>	% solids <u>92.1</u>	Custody/SAF No <u>F08-126-119</u> <u>F08-126</u>

ANALYTE	DUPLICATE		MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL		MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
	pCi/g	2σ ERR (COUNT)					pCi/g	2σ ERR (COUNT)					
Niobium 94	U		0.034		U	GAM	U		0.032	U	-		0.1
Radium 226	0.515	0.082	0.077			GAM	0.515	0.071	0.066		0	35	0
Radium 228	0.914	0.20	0.191			GAM	0.960	0.17	0.161		5	45	0.3

216A5 Crib Charactrztn Samp&Ana-Soil

QC-DUP#1 66726

DUPLICATES

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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>10/09/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

7158-007

B1WBLO

DUPLICATE

SDG <u>7158</u>		Client/Case no <u>Hanford</u> <u>SDG H3809</u>
Contact <u>Melissa C. Mannion</u>		Contract <u>No. 33677</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>R807166-07</u>	Lab sample id <u>R807166-01</u>	Client sample id <u>B1WBLO</u>
Dept sample id <u>7158-007</u>	Dept sample id <u>7158-001</u>	Location/Matrix <u>C6552 ASS-001</u> <u>SOLID</u>
	Received <u>07/25/08</u>	Collected/Weight <u>07/21/08 12:39</u> <u>678 g</u>
% solids <u>92.1</u>	% solids <u>92.1</u>	Custody/SAF No <u>F08-126-119</u> <u>F08-126</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		TEST	pCi/g	(COUNT)	pCi/g	FIERS	%
Americium 241	0.070	0.14	0.267	1.00	U	AM	-0.050	0.10	0.384	U	-	1.4

216A5 Crib Charactrzn Samp&Ana-Soil

QC-DUP#1 67522

DUPLICATES

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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>10/09/08</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3809

7158-001

B1WBL0

D A T A S H E E T

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	SDG <u>H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 33677</u>	
Lab sample id <u>R807166-01</u>	Client sample id <u>B1WBL0</u>	
Dept sample id <u>7158-001</u>	Location/Matrix <u>C6552 ASS-001</u>	<u>SOLID</u>
Received <u>07/25/08</u>	Collected/Weight <u>07/21/08 12:39</u>	<u>678 g</u>
% solids <u>92.1</u>	Custody/SAF No <u>F08-126-119</u>	<u>F08-126</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	21.9	3.2	3.79	400		H
Carbon 14	14762-75-5	5.12	2.0	3.15	50.0		C
Nickel 63	13981-37-8	1.37	1.6	2.61	30.0	U	NI_L
Selenium-79	15758-45-9	1.18	2.0	3.41	10.0	U	SE_L
Total Strontium	SR-RAD	68.6	1.7	0.356	1.00		SR
Technetium 99	14133-76-7	0.070	0.14	0.354	12.0	U	TC
Iodine 129	15046-84-1	0.634	1.4	<u>3.19</u>	2.00	U	I
Thorium 228	14274-82-9	0.941	0.18	0.154	1.00		TH
Thorium 230	14269-63-7	0.697	0.15	0.107	1.00		TH
Thorium 232	TH-232	0.824	0.15	0.078	1.00		TH
Uranium 233/234	U-233/234	0.812	0.26	0.138	1.00		U
Uranium 235	15117-96-1	0.044	0.044	0.167	1.00	U	U
Uranium 238	U-238	0.957	0.26	0.138	1.00		U
Neptunium 237	13994-20-2	0.142	0.19	0.362	1.00	U	NP
Americium 241	14596-10-2	-0.050	0.10	0.384	1.00	U	AM
Plutonium 238	13981-16-3	0.026	0.11	0.253	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.053	0.202	1.00	U	PU
Protactinium 231	14331-85-2	0.154	0.19	0.340	1.00	U	PA
Tin 126	15832-50-5	U		0.284		U	GAM
Beryllium 7	13966-02-4	U		0.359		U	GAM
Potassium 40	13966-00-2	18.0	1.0	0.257			GAM
Cobalt 60	10198-40-0	U		0.035	0.050	U	GAM
Ruthenium 106	13967-48-1	U		0.302		U	GAM
Antimony 125	14234-35-6	U		0.084		U	GAM
Cesium 134	13967-70-9	U		0.047		U	GAM
Cesium 137	10045-97-3	U		0.036	0.100	U	GAM
Europium 152	14683-23-9	U		0.091	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.128</u>	0.100	U	GAM

216A5 Crib Charactrztn Samp&Ana-Soil

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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>10/09/08</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3809

7158-001

B1WBL0

DATA SHEET, cont

SDG <u>7158</u>	Client/Case no <u>Hanford</u>	SDG <u>H3809</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>33677</u>	
Lab sample id <u>R807166-01</u>	Client sample id <u>B1WBL0</u>	
Dept sample id <u>7158-001</u>	Location/Matrix <u>C6552 ASS-001</u>	<u>SOLID</u>
Received <u>07/25/08</u>	Collected/Weight <u>07/21/08 12:39</u>	<u>678 g</u>
% solids <u>92.1</u>	Custody/SAF No <u>F08-126-119</u>	<u>F08-126</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Europium 155	14391-16-3	U		<u>0.132</u>	0.100	U	GAM
Niobium 94	14681-63-1	U		0.032		U	GAM
Radium 226	13982-63-3	0.515	0.071	0.066			GAM
Radium 228	15262-20-1	0.960	0.17	0.161			GAM

216A5 Crib Charactrztn Samp&Ana-Soil

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Lab id <u>EBRLNE</u>
Protocol <u>Fluor</u>
Version <u>Ver 1.0</u>
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Version <u>3.06</u>
Report date <u>10/09/08</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test AM Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Contract SDG H3809

LAB METHOD SUMMARY

AMERICIUM 241 IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

LAB	RAW	SUF-		Americium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	241

Preparation batch 6157-143

R807166-01	A1	7158-001	B1WBLO	U
R807166-05		7158-005	Lab Control Sample	ok
R807166-06		7158-006	Method Blank	U
R807166-07		7158-007	Duplicate (R807166-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00
 216A5 Crib Charactrztzn Samp&Ana-Soil

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 6157-143 2σ prep error 8.0 % Reference Lab Notebook #6157, pg. 143

R807166-01	A1	B1WBLO	0.384	0.500	52	105	79	10/08/08	10/08	SS-031
R807166-05		Lab Control Sample	0.482	0.500	40	105		10/08/08	10/08	SS-032
R807166-06		Method Blank	0.363	0.500	67	105		10/08/08	10/08	SS-033
R807166-07		Duplicate (R807166-01)	0.267	0.500	76	105	79	10/08/08	10/08	SS-034

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

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
SPP-061	Determination of Moisture Content in Solid Samples rev 0	
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 12	

AVERAGES ± 2 SD	MDA	<u>0.374 ± 0.176</u>
FOR 4 SAMPLES	YIELD	<u>59 ± 32</u>

Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 10/09/08

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test NP Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

NEPTUNIUM IN SOLIDS
 ALPHA SPECTROSCOPY

Client Hanford
 Contract No. 33677
 Contract SDG H3809

RESULTS

LAB RAW SUF- Neptunium
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 237

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO	U
R807166-02	7158-002	Lab Control Sample	ok
R807166-03	7158-003	Method Blank	U
R807166-04	7158-004	Duplicate (R807166-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00
 216A5 Crib Charactrztzn Samp&Ana-Soil

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 6157-143 2σ prep error 14.8 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO	0.362	0.500	35	131	63	09/21/08	09/22	SS-055
R807166-02	Lab Control Sample	0.114	0.500	45	132	09/21/08	09/22	SS-056	
R807166-03	Method Blank	0.123	0.500	41	132	09/21/08	09/22	SS-057	
R807166-04	Duplicate (R807166-01)	0.106	0.500	47	132	63	09/21/08	09/22	SS-058

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 12

AVERAGES ± 2 SD	MDA	<u>0.176</u> ± <u>0.248</u>
FOR 4 SAMPLES	YIELD	<u>42</u> ± <u>11</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test PA Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

PA 231 IN SOLIDS
 ALPHA SPECTROSCOPY

Client Hanford
 Contract No. 33677
 Contract SDG H3809

RESULTS

LAB	RAW	SUF-		Protactinium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	231

Preparation batch 6157-143

R807166-01	R1	7158-001	B1WBLO	U
R807166-02	R1	7158-002	Lab Control Sample	<u>HIGH</u>
R807166-03		7158-003	Method Blank	U
R807166-04		7158-004	Duplicate (R807166-01)	- U

Nominal values and limits from method RDLs (pCi/g) 1.00
 216A5 Crib Charactrztzn Samp&Ana-Soil

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 6157-143 2σ prep error 14.8 % Reference Lab Notebook #6157, pg. 143

R807166-01	R1	B1WBLO	0.340	0.200				27			942		58	09/17/08	09/17	SS-031
R807166-02	R1	Lab Control Sample	0.290	0.200				35			942			09/17/08	09/17	SS-040
R807166-03		Method Blank	0.259	0.200				30			745			09/09/08	09/17	SS-042
R807166-04		Duplicate (R807166-01)	0.328	0.200				<u>0</u>			744		58	09/09/08	09/17	SS-036

Nominal values and limits from method 1.00 0.200 20-105 200 180

PROCEDURES	REFERENCE	PA231_IE_PLATE_AEA
SPP-061	Determination of Moisture Content in Solid Samples rev 0	
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
CP-910	Protactinium-231 in Soil, (0 to 0.25 g) Aliquot, rev 2	
CP-008	Heavy Element Electroplating, rev 12	

AVERAGES ± 2 SD	MDA <u>0.304</u> ± <u>0.074</u>
FOR 4 SAMPLES	YIELD <u>23</u> ± <u>31</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test PU Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Contract SDG H3809

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

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

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO		U	U
R807166-02	7158-002	Lab Control Sample		ok	ok
R807166-03	7158-003	Method Blank		U	U
R807166-04	7158-004	Duplicate (R807166-01)		- U	- U

Nominal values and limits from method RDLs (pCi/g) 1.00 1.00
 216A5 Crib Charactrzttn Samp&Ana-Soil

METHOD PERFORMANCE

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EPF	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 6157-143 2σ prep error 8.0 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO		0.253	0.500				64		131		63	09/21/08	09/22	SS-064
R807166-02	Lab Control Sample		0.122	0.500				48		979			09/21/08	09/22	SS-031
R807166-03	Method Blank		0.131	0.500				57		979			09/21/08	09/22	SS-032
R807166-04	Duplicate (R807166-01)		0.164	0.500				47		979		63	09/21/08	09/22	SS-033

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 12

AVERAGES ± 2 SD	MDA	<u>0.168</u> ± <u>0.120</u>
FOR 4 SAMPLES	YIELD	<u>54</u> ± <u>16</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test TH Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Contract SDG H3809

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

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

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO	0.697
R807166-02	7158-002	Lab Control Sample	ok
R807166-03	7158-003	Method Blank	U
R807166-04	7158-004	Duplicate (R807166-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00
 216A5 Crib Charactrzttn Samp&Ana-Soil

METHOD PERFORMANCE

LAB	RAW SUP-		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 6157-143 2σ prep error 8.0 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO	0.154	0.250	96	884	60	09/17/08	09/19	SS-032
R807166-02	Lab Control Sample	0.104	0.250	93	937	09/17/08	09/17	SS-063	
R807166-03	Method Blank	0.254	0.250	91	324	09/17/08	09/18	SS-027	
R807166-04	Duplicate (R807166-01)	0.303	0.250	87	324	59	09/17/08	09/18	SS-032

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 12

AVERAGES ± 2 SD	MDA	<u>0.204</u> ± <u>0.182</u>
FOR 4 SAMPLES	YIELD	<u>92</u> ± <u>8</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test U Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Contract SDG H3809

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

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 6157-143										
R807166-01		7158-001	B1WBLO	0.812	U	0.957	85	36	5	5
R807166-02		7158-002	Lab Control Sample	ok	ok	ok				
R807166-03		7158-003	Method Blank	U	U	U				
R807166-04		7158-004	Duplicate (R807166-01)	ok	- U	ok	111	51	10	14
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	1.00	100		4
216A5 Crib Charactrzn Samp&Ana-Soil							Averages	98		7

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 6157-143 2σ prep error 8.0 % Reference Lab Notebook #6157, pg. 143																
R807166-01			B1WBLO	0.167	0.500			87		145			47	09/06/08	09/06	SS-059
R807166-02			Lab Control Sample	0.748	0.500			91		145				09/06/08	09/06	SS-061
R807166-03			Method Blank	0.189	0.500			74		145				09/06/08	09/06	SS-062
R807166-04			Duplicate (R807166-01)	0.183	0.500			79		145			47	09/06/08	09/06	SS-063
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 12

AVERAGES ± 2 SD MDA 0.322 ± 0.569
 FOR 4 SAMPLES YIELD 83 ± 15

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test SR Matrix SOLID

SDG 7158

Contact Melissa C. Mannion

Client Hanford

Contract No. 33677

Contract SDG H3809

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 6157-143				
R807166-01		7158-001	B1WBLO	68.6
R807166-02		7158-002	Lab Control Sample	ok
R807166-03		7158-003	Method Blank	U
R807166-04		7158-004	Duplicate (R807166-01)	ok

Nominal values and limits from method RDLs (pCi/g) 1.00
216A5 Crib Charactrztn Samp&Ana-Soil

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 6157-143 2σ prep error 10.4 % Reference Lab Notebook #6157, pg. 143															
R807166-01		B1WBLO	0.356	1.00			86	100			53	09/12/08	09/12	GRB-204	
R807166-02		Lab Control Sample	0.162	1.00			77	200				09/12/08	09/12	GRB-220	
R807166-03		Method Blank	0.293	1.00			79	100				09/12/08	09/12	GRB-202	
R807166-04		Duplicate (R807166-01)	0.262	1.00			95	120			53	09/12/08	09/12	GRB-224	

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	
SPP-062	Sample Aliquoting, rev 0	
CP-381	Strontium in Solids, rev 1	

AVERAGES ± 2 SD	MDA	<u>0.268</u> ± <u>0.162</u>
FOR 4 SAMPLES	YIELD	<u>84</u> ± <u>16</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test TC Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford
 Contract No. 33677
 Contract SDG H3809

RESULTS

LAB	RAW	SUF-		Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	99

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO		U
R807166-02	7158-002	Lab Control Sample		ok
R807166-03	7158-003	Method Blank		U
R807166-04	7158-004	Duplicate (R807166-01)		ok

Nominal values and limits from method RDLs (pCi/g) 12.0
 216A5 Crib Charactrztzn Samp&Ana-Soil

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 6157-143 2σ prep error 13.2 % Reference Lab Notebook #6157, pg. 143

R807166-01		B1WBLO		0.354	1.00			98	100			49	09/03/08	09/08	GRB-220
R807166-02		Lab Control Sample		0.486	1.00			96	100				09/03/08	09/06	GRB-206
R807166-03		Method Blank		0.375	1.00			99	100				09/03/08	09/08	GRB-227
R807166-04		Duplicate (R807166-01)		0.339	1.00			104	100			49	09/03/08	09/08	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-021	Preparation of Tc-99m Tracer, rev 4	
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>0.388</u> ± <u>0.133</u>
FOR 4 SAMPLES	YIELD <u>99</u> ± <u>7</u>

METHOD SUMMARIES

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SAMPLE DELIVERY GROUP H3809

Test I Matrix SOLID
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Client Hanford
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LAB METHOD SUMMARY

IODINE 129 IN SOLIDS
 GAMMA SPECTROSCOPY

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Iodine 129

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO		U
R807166-02	7158-002	Lab Control Sample		ok
R807166-03	7158-003	Method Blank		U
R807166-04	7158-004	Duplicate (R807166-01)		- U

Nominal values and limits from method RDLs (pCi/g) 2.00
 216A5 Crib Charactrztzn Samp&Ana-Soil

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 6157-143 2σ prep error 19.4 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO	<u>3.19</u>	1.00	44	<u>216</u>	60	09/16/08	09/19	XSPEC-004
R807166-02	Lab Control Sample	<u>2.07</u>	1.00	91	<u>216</u>		09/16/08	09/19	XSPEC-002
R807166-03	Method Blank	0.738	1.00	84	952		09/16/08	09/19	XSPEC-004
R807166-04	Duplicate (R807166-01)	<u>2.14</u>	1.00	47	952	60	09/16/08	09/19	XSPEC-002

Nominal values and limits from method 2.00 1.00 20-105 300 180

PROCEDURES	REFERENCE	I129_SEP_LEPS_GS
SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 7	
SPP-062	Sample Aliquoting, rev 0	
CP-024	Iodine-129, Sample Dissolution, rev 5	
CP-530	Iodine-129 Purification, rev 1	
CP-008	Heavy Element Electroplating, rev 12	

AVERAGES ± 2 SD	MDA <u>2.03</u> ± <u>2.01</u>
FOR 4 SAMPLES	YIELD <u>66</u> ± <u>49</u>

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3809

Test C Matrix SOLID

SDG 7158

Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford

Contract No. 33677

Contract SDG H3809

RESULTS

LAB RAW SUF-
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO	5.12
R807166-02	7158-002	Lab Control Sample	<u>LOW</u>
R807166-03	7158-003	Method Blank	U
R807166-04	7158-004	Duplicate (R807166-01)	ok

Nominal values and limits from method RDLs (pCi/g) 50.0
216A5 Crib Charactrztn Samp&Ana-Soil

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 6157-143 2σ prep error 10.0 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO	3.15	0.446	100	50	44	08/30/08	09/03	LSC-006
R807166-02	Lab Control Sample	3.60	0.400	100	50		08/30/08	09/03	LSC-006
R807166-03	Method Blank	3.47	0.400	100	50		08/30/08	09/03	LSC-006
R807166-04	Duplicate (R807166-01)	3.14	0.448	100	50	44	08/30/08	09/03	LSC-006

Nominal values and limits from method 50.0 0.400 10 180

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

AVERAGES ± 2 SD MDA 3.34 ± 0.463
FOR 4 SAMPLES YIELD 100 ± 0

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SAMPLE DELIVERY GROUP H3809

Test NI L Matrix SOLID
 SDG 7158
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. 33677
 Contract SDG H3809

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 6157-143

R807166-01	7158-001	B1WBLO	U
R807166-02	7158-002	Lab Control Sample	ok
R807166-03	7158-003	Method Blank	U
R807166-04	7158-004	Duplicate (R807166-01)	- U

Nominal values and limits from method RDLs (pCi/g) 30.0
 216A5 Crib Charactrztn Samp&Ana-Soil

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 6157-143 2σ prep error 11.2 % Reference Lab Notebook #6157, pg. 143

R807166-01	B1WBLO	2.61	0.500	92	50	51	09/09/08	09/10	LSC-005
R807166-02	Lab Control Sample	2.52	0.500	97	50	09/09/08	09/10	LSC-005	
R807166-03	Method Blank	2.56	0.500	96	50	09/09/08	09/10	LSC-005	
R807166-04	Duplicate (R807166-01)	3.08	0.500	80	50	51	09/09/08	09/10	LSC-005

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>2.69</u> ± <u>0.522</u>
FOR 4 SAMPLES	YIELD	<u>91</u> ± <u>16</u>

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3809

SDG 7158
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 33677
Case no SDG_H3809

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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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3809

SDG 7158
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG_H3809

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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WORK SUMMARY

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

The following notes apply to this report:

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

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DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

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

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

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

2. The error of ADDED.

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

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

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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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Client: F. HANFORD City MCKEAN State WA
 Date/Time received 07/25/08 08:30 CoC No. FB8-126-119
 Container I.D. No. GP-03-020 Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

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

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by M King Date: 07/25/08 Time: 10:00

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
B1WBLO	260						

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. 100482 Calibration date 10 JUL 08