



EBERLINE
SERVICES

May 23, 2006

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



Reference: **P.O. #630**
Eberline Services R6-04-077-7417, SDG K0298

Dear Ms. Kessner:

Enclosed is the data report for five solid (soil) samples designated under SAF No. RC-051. The samples were received at Eberline Services on April 5, 2006. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
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1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0298 was composed of five solid (soil) samples designated under SAF No. RC-051 with a Project Designation of: 100 & 300 Area Component of the RCBRA-Incremental So.

The strontium, thorium, and uranium aliquots were taken from 30-gram leachates of the respective samples and not from full dissolutions. The gamma aliquots were taken from the samples as received.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. All results were transmitted to WCH via e-mail on May 23, 2006.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.2 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.3 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.4 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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



Melissa C. Mannion
Senior Program Manager

5/23/06

Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0298

SDG 7417
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_K0298

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J. J. J.
Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/23/06

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0298

SDG 7417
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K0298

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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SAMPLE DELIVERY GROUP K0298

SDG 7417

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford

Contract No. 630

Case no SDG_K0298

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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Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

SDG 7417
 Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG K0298

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
J11JL1	UPRIVER RIPARIAN #12	SOLID		R604077-01	RC-051	RC-051-124	04/03/06 11:30
J11JL2	UPRIVER RIPARIAN #12	SOLID		R604077-02	RC-051	RC-051-124	04/03/06 13:30
J11JL3	UPRIVER RIPARIAN #12	SOLID		R604077-03	RC-051	RC-051-124	04/03/06 15:00
J11JL4	UPRIVER RIPARIAN #12	SOLID		R604077-04	RC-051	RC-051-124	04/03/06 16:00
J11JL5	UPRIVER RIPARIAN #12	SOLID		R604077-05	RC-051	RC-051-124	04/03/06 17:30
Method Blank		SOLID		R604077-07	RC-051		
Lab Control Sample		SOLID		R604077-06	RC-051		
Duplicate (R604077-01)	UPRIVER RIPARIAN #12	SOLID		R604077-08	RC-051		04/03/06 11:30

SAMPLE SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

SDG 7417
 Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG K0298

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
7417	RC-051-124	J11JL1	SOLID	100.0	491 g		04/05/06	2	R604077-01	7417-001
		J11JL2	SOLID	100.0	430 g		04/05/06	2	R604077-02	7417-002
		J11JL3	SOLID	100.0	431 g		04/05/06	2	R604077-03	7417-003
		J11JL4	SOLID	100.0	430 g		04/05/06	2	R604077-04	7417-004
		J11JL5	SOLID	100.0	430 g		04/05/06	2	R604077-05	7417-005
		Method Blank	SOLID						R604077-07	7417-007
		Lab Control Sample	SOLID						R604077-06	7417-006
		Duplicate (R604077-01)	SOLID	100.0	491 g		04/05/06	2	R604077-08	7417-008

QC SUMMARY

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SAMPLE DELIVERY GROUP K0298

SDG 7417
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG K0298

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS	
Alpha Spectroscopy									
TH	SOLID	Thorium, Isotopic in Solids	7181-054	5.0	5		1	1	1/1
U	SOLID	Uranium, Isotopic in Solids	7181-054	5.0	5		1	1	1/1
Beta Counting									
SR	SOLID	Total Strontium in Solids	7181-054	10.0	5		1	1	1/1
Gamma Spectroscopy									
GAM	SOLID	Gamma Scan	7181-054	15.0	5		1	1	1/1

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

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SAMPLE DELIVERY GROUP K0298

SDG 7417
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG K0298

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED		SUF-						
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
J11JL1		R604077-01	7417-001	GAM		05/16/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-001	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
RC-051-124	RC-051	04/05/06	7417-001	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-001	U		05/09/06	05/11/06	MWT	Uranium, Isotopic in Solids	
J11JL2		R604077-02	7417-002	GAM		05/16/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-002	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
RC-051-124	RC-051	04/05/06	7417-002	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-002	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
J11JL3		R604077-03	7417-003	GAM		05/16/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-003	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
RC-051-124	RC-051	04/05/06	7417-003	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-003	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
J11JL4		R604077-04	7417-004	GAM		05/17/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-004	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
RC-051-124	RC-051	04/05/06	7417-004	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-004	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
J11JL5		R604077-05	7417-005	GAM		05/16/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-005	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
RC-051-124	RC-051	04/05/06	7417-005	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-005	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
Method Blank		R604077-07	7417-007	GAM		05/16/06	05/18/06	MWT	Gamma Scan	
	SOLID		7417-007	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
	RC-051		7417-007	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-007	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
Lab Control Sample		R604077-06	7417-006	GAM		05/17/06	05/18/06	MWT	Gamma Scan	
	SOLID		7417-006	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
	RC-051		7417-006	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-006	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	
Duplicate (R604077-01)		R604077-08	7417-008	GAM		05/17/06	05/18/06	MWT	Gamma Scan	
UPRIVER RIPARIAN #12	SOLID	04/03/06	7417-008	SR		05/04/06	05/08/06	MWT	Total Strontium in Solids	
	RC-051	04/05/06	7417-008	TH		05/06/06	05/08/06	MWT	Thorium, Isotopic in Solids	
			7417-008	U		05/05/06	05/11/06	MWT	Uranium, Isotopic in Solids	

WORK SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

SDG 7417
 Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
 Contract No. 630
 Case no SDG K0298

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	RC-051	Gamma Scan	GAMMA_GS	5			1	1	1	8
SR	RC-051	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	5			1	1	1	8
TH	RC-051	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	5			1	1	1	8
U	RC-051	Uranium, Isotopic in Solids	UIISO_PLATE_AEA	5			1	1	1	8
TOTALS				20			4	4	4	32

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0298

R604077-07

Method Blank

METHOD BLANK

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-07</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7417-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-051</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.002	0.13	0.27	1.0	U	SR
Thorium 228	14274-82-9	0.118	0.24	0.57	1.0	U	TH
Thorium 230	14269-63-7	0.059	0.35	0.56	1.0	U	TH
Thorium 232	TH-232	0.118	0.12	0.45	1.0	U	TH
Uranium 233/234	U-233/234	0.026	0.052	0.20	1.0	U	U
Uranium 235	15117-96-1	0.031	0.063	0.24	1.0	U	U
Uranium 238	U-238	0	0.052	0.20	1.0	U	U
Potassium 40	13966-00-2	U		0.63		U	GAM
Cobalt 60	10198-40-0	U		0.046	0.050	U	GAM
Cesium 137	10045-97-3	U		0.048	0.10	U	GAM
Radium 226	13982-63-3	U		0.096	0.10	U	GAM
Radium 228	15262-20-1	U		<u>0.21</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>0.14</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.16</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.078	0.10	U	GAM
Thorium 228	14274-82-9	U		0.074		U	GAM
Thorium 232	TH-232	U		0.21		U	GAM
Uranium 235	15117-96-1	U		0.17		U	GAM
Uranium 238	U-238	U		5.5		U	GAM
Americium 241	14596-10-2	U		0.040		U	GAM
Cesium 134	13967-70-9	U		0.078		U	GAM

100&300Area Compnt RCBRA-Incrmntl So

QC-BLANK 56865

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP R0298

R604077-06

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7417</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R604077-06</u> Dept sample id <u>7417-006</u>	Client/Case no <u>Hanford</u> SDG <u>K0298</u> Contract <u>No. 630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>RC-051</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
Total Strontium	10.4	0.56	0.23	1.0	SR	9.80	0.39	106	81-119	80-120
Thorium 230	45.4	6.7	0.62	1.0	TH	40.4	1.6	112	73-127	80-120
Uranium 233/234	17.9	1.8	0.85	1.0	U	18.6	0.74	96	83-117	80-120
Uranium 235	15.2	1.6	0.19	1.0	U	15.1	0.60	101	81-119	80-120
Uranium 238	18.5	1.8	0.81	1.0	U	20.2	0.81	92	84-116	80-120
Cobalt 60	2.95	0.29	<u>0.14</u>	0.050	GAM	2.84	0.11	104	71-129	80-120
Cesium 137	3.19	0.25	<u>0.16</u>	0.10	GAM	2.96	0.12	108	72-128	80-120

100&300Area Compnt RCBRA-Incrmntl So

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
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Form <u>DVD-LCS</u>
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

R604077-08

J11JL1

DUPLICATE

SDG <u>7417</u>		Client/Case no <u>Hanford</u>	<u>SDG K0298</u>
Contact <u>Melissa C. Mannion</u>		Contract No. <u>630</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>R604077-08</u>	Lab sample id <u>R604077-01</u>	Client sample id <u>J11JL1</u>	
Dept sample id <u>7417-008</u>	Dept sample id <u>7417-001</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
	Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 11:30</u>	<u>491 g</u>
% solids <u>100.0</u>	% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</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
Total Strontium	0.009	0.13	0.27	1.0	U	SR	-0.064	0.12	0.27	U	-		0.8
Thorium 228	0.339	0.29	0.37	1.0	U	TH	0.443	0.34	0.42		27	172	0.5
Thorium 230	0.290	0.29	0.37	1.0	U	TH	0.110	0.22	0.42	U	-		1.0
Thorium 232	0.483	0.29	0.37	1.0		TH	0.332	0.22	0.42	U	37	134	0.8
Uranium 233/234	0.488	0.23	0.22	1.0		U	0.653	0.097	0.032		29	66	1.3
Uranium 235	0	0.069	0.27	1.0	U	U	0.049	0.033	0.031		200	468	1.3
Uranium 238	0.631	0.29	0.22	1.0		U	0.595	0.090	0.032		6	75	0.2
Potassium 40	9.69	1.5	0.75			GAM	9.89	1.4	0.75		2	45	0.1
Cobalt 60	U		<u>0.085</u>	0.050	U	GAM	U		<u>0.078</u>	U	-		0.1
Cesium 137	0.119	0.077	0.094	0.10		GAM	0.116	0.064	0.083		3	132	0.1
Radium 226	0.540	0.14	<u>0.13</u>	0.10		GAM	0.568	0.14	<u>0.15</u>		5	62	0.2
Radium 228	0.570	0.36	<u>0.40</u>	0.20		GAM	0.565	0.31	<u>0.34</u>		1	130	0
Europium 152	U		<u>0.20</u>	0.10	U	GAM	U		<u>0.18</u>	U	-		0.1
Europium 154	U		<u>0.29</u>	0.10	U	GAM	U		<u>0.28</u>	U	-		0
Europium 155	U		<u>0.22</u>	0.10	U	GAM	U		<u>0.20</u>	U	-		0.1
Thorium 228	0.607	0.10	0.11			GAM	0.638	0.092	0.097		5	46	0.3
Thorium 232	0.570	0.36	0.40			GAM	0.565	0.31	0.34		1	130	0
Uranium 235	U		0.33		U	GAM	U		0.32	U	-		0
Uranium 238	U		11		U	GAM	U		9.4	U	-		0.2
Americium 241	U		0.34		U	GAM	U		0.31	U	-		0.1
Cesium 134	U		0.12		U	GAM	U		0.083	U	-		0.5

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QC-DUP#1 56866

DUPLICATES

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SUMMARY DATA SECTION

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Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>05/23/06</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0298

R604077-01

J11JL1

DATA SHEET

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-01</u>	Client sample id <u>J11JL1</u>	
Dept sample id <u>7417-001</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 11:30</u>	<u>491 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.064	0.12	0.27	1.0	U	SR
Thorium 228	14274-82-9	0.443	0.34	0.42	1.0		TH
Thorium 230	14269-63-7	0.110	0.22	0.42	1.0	U	TH
Thorium 232	TH-232	0.332	0.22	0.42	1.0	U	TH
Uranium 233/234	U-233/234	0.653	0.097	0.032	1.0		U
Uranium 235	15117-96-1	0.049	0.033	0.031	1.0		U
Uranium 238	U-238	0.595	0.090	0.032	1.0		U
Potassium 40	13966-00-2	9.89	1.4	0.75			GAM
Cobalt 60	10198-40-0	U		0.078	0.050	U	GAM
Cesium 137	10045-97-3	0.116	0.064	0.083	0.10		GAM
Radium 226	13982-63-3	0.568	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	0.565	0.31	0.34	0.20		GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.638	0.092	0.097			GAM
Thorium 232	TH-232	0.565	0.31	0.34			GAM
Uranium 235	15117-96-1	U		0.32		U	GAM
Uranium 238	U-238	U		9.4		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Cesium 134	13967-70-9	U		0.083		U	GAM

100&300Area Compnt RCBRA-Incrmntl So

DATA SHEETS

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/23/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0298

R604077-02

J11JL2

DATA SHEET

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-02</u>	Client sample id <u>J11JL2</u>	
Dept sample id <u>7417-002</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 13:30</u>	<u>430 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.120	0.17	0.33	1.0	U	SR
Thorium 228	14274-82-9	0.194	0.23	0.30	1.0	U	TH
Thorium 230	14269-63-7	0.155	0.23	0.30	1.0	U	TH
Thorium 232	TH-232	0.425	0.23	0.30	1.0		TH
Uranium 233/234	U-233/234	0.600	0.27	0.26	1.0		U
Uranium 235	15117-96-1	0.121	0.16	0.31	1.0	U	U
Uranium 238	U-238	0.567	0.27	0.26	1.0		U
Potassium 40	13966-00-2	9.79	1.8	1.1			GAM
Cobalt 60	10198-40-0	U		<u>0.11</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.14</u>	0.10	U	GAM
Radium 226	13982-63-3	0.606	0.20	<u>0.20</u>	0.10		GAM
Radium 228	15262-20-1	0.522	0.35	<u>0.48</u>	0.20		GAM
Europium 152	14683-23-9	U		<u>0.22</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.34</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.21</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.654	0.10	0.12			GAM
Thorium 232	TH-232	0.522	0.35	0.48			GAM
Uranium 235	15117-96-1	U		0.32		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.25		U	GAM
Cesium 134	13967-70-9	U		0.12		U	GAM

100&300Area Compnt RCBRA-Incrmnt1 So

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0298

R604077-03

J11JL3

DATA SHEET

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-03</u>	Client sample id <u>J11JL3</u>	
Dept sample id <u>7417-003</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 15:00</u>	<u>431 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	0.024	0.14	0.27	1.0	U	SR
Thorium 228	14274-82-9	0.707	0.48	0.45	1.0		TH
Thorium 230	14269-63-7	0.470	0.36	0.45	1.0		TH
Thorium 232	TH-232	0.411	0.36	0.45	1.0	U	TH
Uranium 233/234	U-233/234	0.715	0.32	0.24	1.0		U
Uranium 235	15117-96-1	0.075	0.076	0.29	1.0	U	U
Uranium 238	U-238	0.715	0.32	0.24	1.0		U
Potassium 40	13966-00-2	9.10	1.8	1.3			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.27	0.10	U	GAM
Radium 226	13982-63-3	0.738	0.20	0.18	0.10		GAM
Radium 228	15262-20-1	0.632	0.40	0.43	0.20		GAM
Europium 152	14683-23-9	U		0.23	0.10	U	GAM
Europium 154	15585-10-1	U		0.41	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.591	0.11	0.12			GAM
Thorium 232	TH-232	0.632	0.40	0.43			GAM
Uranium 235	15117-96-1	U		0.37		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Cesium 134	13967-70-9	U		0.14		U	GAM

100&300Area Compnt RCBRA-Incrmntl So

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0298

R604077-04

J11JL4

DATA SHEET

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-04</u>	Client sample id <u>J11JL4</u>	
Dept sample id <u>7417-004</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 16:00</u>	<u>430 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	0.086	0.14	0.26	1.0	U	SR
Thorium 228	14274-82-9	0.104	0.42	0.79	1.0	U	TH
Thorium 230	14269-63-7	0.104	0.41	0.79	1.0	U	TH
Thorium 232	TH-232	0.207	0.41	0.79	1.0	U	TH
Uranium 233/234	U-233/234	0.828	0.33	0.20	1.0		U
Uranium 235	15117-96-1	0.065	0.065	0.25	1.0	U	U
Uranium 238	U-238	0.561	0.27	0.20	1.0		U
Potassium 40	13966-00-2	12.3	2.5	1.1			GAM
Cobalt 60	10198-40-0	U		0.15	0.050	U	GAM
Cesium 137	10045-97-3	U		0.15	0.10	U	GAM
Radium 226	13982-63-3	0.556	0.18	0.17	0.10		GAM
Radium 228	15262-20-1	1.25	0.48	0.40	0.20		GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.832	0.15	0.16			GAM
Thorium 232	TH-232	1.25	0.48	0.40			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM
Cesium 134	13967-70-9	U		0.12		U	GAM

100&300Area Compt RCBRA-Incrmntl So

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0298

R604077-05

J11JL5

DATA SHEET

SDG <u>7417</u>	Client/Case no <u>Hanford</u>	SDG <u>K0298</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R604077-05</u>	Client sample id <u>J11JL5</u>	
Dept sample id <u>7417-005</u>	Location/Matrix <u>UPRIVER RIPARIAN #12</u>	<u>SOLID</u>
Received <u>04/05/06</u>	Collected/Weight <u>04/03/06 17:30</u>	<u>430 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-051-124</u>	<u>RC-051</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.013	0.13	0.27	1.0	U	SR
Thorium 228	14274-82-9	0.792	0.54	0.50	1.0		TH
Thorium 230	14269-63-7	0	0.26	0.50	1.0	U	TH
Thorium 232	TH-232	0.264	0.27	0.50	1.0	U	TH
Uranium 233/234	U-233/234	0.634	0.25	0.19	1.0		U
Uranium 235	15117-96-1	0.030	0.059	0.23	1.0	U	U
Uranium 238	U-238	0.487	0.20	0.19	1.0		U
Potassium 40	13966-00-2	10.1	3.5	0.88			GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	0.188	0.093	0.098	0.10		GAM
Radium 226	13982-63-3	0.454	0.18	0.17	0.10		GAM
Radium 228	15262-20-1	0.901	0.45	0.45	0.20		GAM
Europium 152	14683-23-9	U		0.24	0.10	U	GAM
Europium 154	15585-10-1	U		0.29	0.10	U	GAM
Europium 155	14391-16-3	U		0.29	0.10	U	GAM
Thorium 228	14274-82-9	0.655	0.16	0.17			GAM
Thorium 232	TH-232	0.901	0.45	0.45			GAM
Uranium 235	15117-96-1	U		0.35		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM
Cesium 134	13967-70-9	U		0.12		U	GAM

100&300Area Compnt RCBRA-Incrmntl So

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

Test TH Matrix SOLID
 SDG 7417
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG K0298

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Thorium 230
Preparation batch 7181-054				
J11JL1	R604077-01		7417-001	U
J11JL2	R604077-02		7417-002	U
J11JL3	R604077-03		7417-003	0.470
J11JL4	R604077-04		7417-004	U
J11JL5	R604077-05		7417-005	U
Method Blank	R604077-07		7417-007	U
Lab Control Sample	R604077-06		7417-006	ok
Duplicate (R604077-01)	R604077-08		7417-008	- U
Nominal values and limits from method				
100&300Area Compnt RCBRA-Incrmntl So			RDLs (pCi/g)	1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7181-054 2σ prep error 5.0 % Reference Lab Notebook 7181 pg. 52																
J11JL1	R604077-01		0.42	0.250				62		155			33	05/05/06	05/06	SS-061
J11JL2	R604077-02		0.30	0.250				91		156			33	05/05/06	05/06	SS-062
J11JL3	R604077-03		0.45	0.250				68		156			33	05/05/06	05/06	SS-063
J11JL4	R604077-04		0.79	0.250				34		156			33	05/05/06	05/06	SS-064
J11JL5	R604077-05		0.50	0.250				55		156			33	05/05/06	05/06	SS-066
Method Blank	R604077-07		0.57	0.250				55		156				05/05/06	05/06	SS-028
Lab Control Sample	R604077-06		0.62	0.250				41		156				05/05/06	05/06	SS-027
Duplicate (R604077-01)	R604077-08		0.37	0.250				69		156			33	05/05/06	05/06	SS-029
Nominal values and limits from method																
			1.0	0.250				20-105		150			180			

Lab id EBRLNE
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

Test TH Matrix SOLID
SDG 7417
Contact Melissa C. Mannion

METHOD SUMMARY, cont.

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG K0298

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	SPP-073	Soil Leaching 10-200 g Aliquot, rev 0
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD	MDA	<u>0.50</u>	±	<u>0.31</u>
FOR 8 SAMPLES	YIELD	<u>59</u>	±	<u>35</u>

Lab id EBRLNE
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Version 3.06
Report date 05/23/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

Test U Matrix SOLID
 SDG 7417
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG K0298

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)				
			233/234	235	238	1+3	2σ	2+3	2σ	
Preparation batch 7181-054										
J11JL1	R604077-01	7417-001	0.653	0.049	0.595	110	23	8	6	
J11JL2	R604077-02	7417-002	0.600	U	0.567	106	69	21	30	
J11JL3	R604077-03	7417-003	0.715	U	0.715	100	63	10	12	
J11JL4	R604077-04	7417-004	0.828	U	0.561	148	92	12	13	
J11JL5	R604077-05	7417-005	0.634	U	0.487	130	74	6	12	
Method Blank	R604077-07	7417-007	U	U	U					
Lab Control Sample	R604077-06	7417-006	ok	ok	ok					
Duplicate (R604077-01)	R604077-08	7417-008	ok	ok	U	ok	77	51	0	11
Nominal values and limits from method			RDLs (pCi/g)	1.0	1.0	1.0	100	4		
100&300Area Compnt RCBRA-Incrmntl So						Averages	112	10		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-		
													PREPARED	YZED	DETECTOR
Preparation batch 7181-054 2σ prep error 5.0 % Reference Lab Notebook 7181 pg. 52															
J11JL1	R604077-01		0.032	0.500			74		910		36	05/05/06	05/09	SS-037	
J11JL2	R604077-02		0.31	0.500			76		101		32	05/05/06	05/05	SS-055	
J11JL3	R604077-03		0.29	0.500			74		117		32	05/05/06	05/05	SS-034	
J11JL4	R604077-04		0.25	0.500			74		116		32	05/05/06	05/05	SS-035	
J11JL5	R604077-05		0.23	0.500			81		116		32	05/05/06	05/05	SS-036	
Method Blank	R604077-07		0.24	0.500			73		116			05/05/06	05/05	SS-038	
Lab Control Sample	R604077-06		0.85	0.500			97		116			05/05/06	05/05	SS-037	
Duplicate (R604077-01)	R604077-08		0.27	0.500			79		116		32	05/05/06	05/05	SS-039	
Nominal values and limits from method			1.0	0.500			20-105		100	100	180				

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

Test U Matrix SOLID
SDG 7417
Contact Melissa C. Mannion

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG K0298

PROCEDURES	REFERENCE	UIISO_PLATE_AEA
	CP-073	Soil Leaching, 10 - 200 g Aliquot, rev 3
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 9

AVERAGES \pm 2 SD	MDA <u>0.31</u> \pm <u>0.47</u>
FOR 8 SAMPLES	YIELD <u>78</u> \pm <u>16</u>

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/23/06

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Test SR Matrix SOLID
SDG 7417
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG K0298

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 7181-054					
J11JL1	R604077-01			7417-001	U
J11JL2	R604077-02			7417-002	U
J11JL3	R604077-03			7417-003	U
J11JL4	R604077-04			7417-004	U
J11JL5	R604077-05			7417-005	U
Method Blank	R604077-07			7417-007	U
Lab Control Sample	R604077-06			7417-006	ok
Duplicate (R604077-01)	R604077-08			7417-008	- U

Nominal values and limits from method RDLs (pCi/g) 1.0
100&300Area Compnt RCBRA-Incrmntl So

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	BFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7181-054 2σ prep error 10.0 % Reference Lab Notebook 7181 pg. 52																
J11JL1	R604077-01			0.27	1.00			89	100				31	05/04/06	05/04	GRB-218
J11JL2	R604077-02			0.33	1.00			92	100				31	05/04/06	05/04	GRB-226
J11JL3	R604077-03			0.27	1.00			89	100				31	05/04/06	05/04	GRB-227
J11JL4	R604077-04			0.26	1.00			89	100				31	05/04/06	05/04	GRB-228
J11JL5	R604077-05			0.27	1.00			93	100				31	05/04/06	05/04	GRB-229
Method Blank	R604077-07			0.27	1.00			92	100					05/04/06	05/04	GRB-232
Lab Control Sample	R604077-06			0.23	1.00			84	100					05/04/06	05/04	GRB-223
Duplicate (R604077-01)	R604077-08			0.27	1.00			93	100				31	05/04/06	05/04	GRB-201

Nominal values and limits from method 1.0 1.00 30-105 100 180

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
CP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
CP-383 Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1

AVERAGES ± 2 SD MDA 0.27 ± 0.055
FOR 8 SAMPLES YIELD 90 ± 6

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0298

Test GAM Matrix SOLID
 SDG 7417
 Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. 630
 Contract SDG K0298

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7181-054						
J11JL1	R604077-01	7417-001			U	0.116
J11JL2	R604077-02	7417-002			U	U
J11JL3	R604077-03	7417-003			U	U
J11JL4	R604077-04	7417-004			U	U
J11JL5	R604077-05	7417-005			U	0.188
Method Blank	R604077-07	7417-007			U	U
Lab Control Sample	R604077-06	7417-006			ok	ok
Duplicate (R604077-01)	R604077-08	7417-008			- U	ok

Nominal values and limits from method RDLs (pCi/g) 0.050 0.10
 100&300Area Compnt RCBRA-Incrmntl So

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7181-054 2σ prep error 15.0 % Reference Lab Notebook 7181 pg. 52															
J11JL1	R604077-01	7417-001		17	167					146			43	04/27/06	JR,05,00
J11JL2	R604077-02	7417-002		20	169					146			43	04/27/06	JR,03,00
J11JL3	R604077-03	7417-003		23	173					110			43	04/27/06	JR,03,00
J11JL4	R604077-04	7417-004		23	171					121			44	04/27/06	JR,08,00
J11JL5	R604077-05	7417-005		26	169					109			43	04/27/06	JR,02,00
Method Blank	R604077-07	7417-007		42	166					110				04/27/06	JR,07,00
Lab Control Sample	R604077-06	7417-006		0.14	166					121				04/27/06	JR,03,00
Duplicate (R604077-01)	R604077-08	7417-008		19	167					121			44	04/27/06	JR,05,00

Nominal values and limits from method 0.050 166 100 180

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

AVERAGES ± 2 SD MDA 21 ± 23
 FOR 8 SAMPLES YIELD _____ ± _____

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 Form DVD-CMS
 Version 3.06
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SAMPLE DELIVERY GROUP K0298

SDG 7417
Contact Melissa C. Mannion

REPORT GUIDE

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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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SDG 7417

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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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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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- * 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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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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METHOD SUMMARY

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

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

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

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

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

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

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METHOD SUMMARY

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

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

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

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

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Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-051-124		Page 1 of 1			
Collector STANKOVICH, M.			Company Contact JOAN KESSNER		Telephone No. 375-4688		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 45 Days			
Project Designation 100 & 300 Area Component of the RCBRA - Incremental So			Sampling Location UPRIVER RIPARIAN #12 K0298 (71A)			SAF No. RC-051		Air Quality <input type="checkbox"/>						
Ice Chest No.			Field Logbook No. EL-1596-1		COA BESRAS6520		Method of Shipment FED EX							
Shipped To EBERLINE SERVICES / LIONVILLE			Offsite Property No. A060151			Bill of Lading/Air Bill No. SEE OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS NONE				Preservation	None	None	None	None	None	None	None	None		
Special Handling and/or Storage Use page 3 for original material to Corvallis for MIS preparation and aliquoting, page 1 for radioanalytical fractions to Eberline, & page 2 for chemical analytical fractions to Lionville.				Type of Container	G/P	G/P								
				No. of Container(s)	5	7	0	0	0	0	0	0	0	0
				Volume	400g	30g	1'	1'	1'	1^	1^	1^	1^	1^
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Strontium-89,90 -- Total Sr	Isotopic Thorium (Thorium-232)	Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)	Isotopic Plutonium (Plutonium-238, Plutonium-239/240)						
Sample No.	Matrix *	Sample Date	Sample Time											
J11JL1	SOIL	4-3-06	11:30	1	3									
J11JL2			13:30	1	1									
J11JL3			15:00	1	1									
J11JL4			16:00	1	1									
J11JL5			17:30	1	1									
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		* These marks indicate that unless lined out, analytes to be included with Strontium-89,90 -- Total Sr analysis fraction. ~ These marks indicate that this is a non-analysis used to properly format COC form. Contact Joan Kessner for any questions. (1) Gamma Spec - (Full List) (Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226, Radium-228)				S=Soil SE=Settlement SD=Solid SL=Sludge W=Water O=Oil A=Air OS=Drum Solids DL=Drum Liquid T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other		
Elizabeth M. Tepper		11:30		CHZ M Hill		11:30								
Elizabeth M. Tepper		4-4-06		Fed Ex		4-4-06 11:30								
Fed Ex				Fuj		04/05/06 9:15								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION		Received By				Title				Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time				



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City MICHLAND State WA

Date/Time received 04/05/06 9:15 CoC No. PC-051-124

Container I.D. No. 10E CHEST Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

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

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

15. Inspected by MPW Date: 04/05/06 Time: 10:45

Customer Sample No.	cpm	mR/hr	Wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. _____ Calibration date _____