

SAF-RC-075
100-D/DR Burial Grounds & Remaining
Sites – Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Jeanette Duncan

H4-21

KW 8/21/07
INITIAL/DATE

COMMENTS:

SDG K0870

SAF-RC-075

ADD ON RAD – Total-Sr added J155Y5, J155Y6 & J155Y7

Rad only

Chem only

Rad & Chem

Complete

Partial

Waste Site: 100-D-14

RECEIVED
AUG 23 2007
EDMC



EBERLINE SERVICES



August 17, 2007

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R7-07-073-7825, SDG K0870
R7-07-186-7825

Dear Ms. Kessner:

Enclosed is the data report for three solid (soil) samples designated under SAF No. RC-075, received at Eberline Services on July 13, 2007. Results for gross alpha/gross beta and gamma spectroscopy were reported on July 30, 2007. This report includes Sr analysis results ordered for the samples.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

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

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0870 was composed of one solid (soil) samples designated under SAF No. RC-075 with a Project Designation of: 100-D/DR Burial Grounds & Remaining Sites-Soil Full Prot.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on July 27 and August 16, 2007.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy

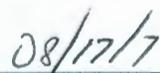
No problems were encountered during the course of the analyses.

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



Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0870

SDG 7825
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_K0870

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 08/16/07

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY, GROUP K0870

SDG 7825
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K0870

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825

Contact Melissa C. Mannion

Client Hanford

Contract No. 630

Case no SDG K0870

GUIDE, cont.

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

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Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-RG

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Report date 08/16/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825

Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford

Contract No. 630

Case no SDG K0870

LAB						CHAIN OF	
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED
R707073-01	J155Y5	100-D-14	SOLID		RC-075	RC-075-001	07/11/07 10:01
R707073-02	J155Y6	100-D-14	SOLID		RC-075	RC-075-001	07/11/07 10:01
R707073-03	J155Y7	100-D-14	SOLID		RC-075	RC-075-001	07/11/07 10:14
R707073-04	Lab Control Sample		SOLID		RC-075		
R707073-05	Method Blank		SOLID		RC-075		
R707073-06	Duplicate (R707073-01)	100-D-14	SOLID		RC-075		07/11/07 10:01
R707073-07	Lab Control Sample		SOLID		RC-075		
R707073-08	Method Blank		SOLID		RC-075		
R707073-09	Duplicate (R707073-01)	100-D-14	SOLID		RC-075		07/11/07 10:01

LAB SUMMARY

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Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LS

Version 3.06

Report date 08/16/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG K0870

QC SUMMARY

BATCH	CHAIN OF	CLIENT SAMPLE ID	MATRIX	%	SAMPLE	BASIS	DAYS SINCE		LAB	DEPARTMENT
	CUSTODY						RECEIVED	COLL		
325	RC-075-001	J155Y5	SOLID	92.9	492 g		07/13/07	2	R707073-01	7825-001
		J155Y6	SOLID	93.0	553 g		07/13/07	2	R707073-02	7825-002
		J155Y7	SOLID	96.4	568 g		07/13/07	2	R707073-03	7825-003
		Method Blank	SOLID						R707073-05	7825-005
		Method Blank	SOLID						R707073-08	7825-008
		Lab Control Sample	SOLID						R707073-04	7825-004
		Lab Control Sample	SOLID						R707073-07	7825-007
		Duplicate (R707073-01)	SOLID	92.9	492 g		07/13/07	2	R707073-06	7825-006
		Duplicate (R707073-01)	SOLID	92.9	492 g		07/13/07	2	R707073-09	7825-009

QC SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG K0870

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Beta Counting										
SR	SOLID	Total Strontium in Solids	6109-193	10.0	3			1	1	1/1
Gas Proportional Counting										
93A	SOLID	Gross Alpha in Solids	6109-193	20.0	3			1	1	1/1
93B	SOLID	Gross Beta in Solids	6109-193	15.0	3			1	1	1/1
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	6109-193	15.0	3			1	1	1/1

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

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825

Contact Melissa C. Mannion

LAB WORK SUMMARY

Client Hanford

Contract No. 630

Case no SDG K0870

LAB SAMPLE	CLIENT SAMPLE ID									
COLLECTED	LOCATION	MATRIX			SUF-					
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
'07073-01	J155Y5		7825-001	93A/93		07/24/07	07/24/07	BW	Gross Alpha in Solids	
07/11/07	100-D-14		SOLID 7825-001	93B/93		07/24/07	07/24/07	BW	Gross Beta in Solids	
07/13/07	RC-075-001	RC-075	7825-001	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
			7825-001	SR		08/10/07	08/14/07	BW	Total Strontium in Solids	
'07073-02	J155Y6		7825-002	93A/93		07/24/07	07/24/07	BW	Gross Alpha in Solids	
07/11/07	100-D-14		SOLID 7825-002	93B/93		07/24/07	07/24/07	BW	Gross Beta in Solids	
07/13/07	RC-075-001	RC-075	7825-002	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
			7825-002	SR		08/10/07	08/15/07	BW	Total Strontium in Solids	
'07073-03	J155Y7		7825-003	93A/93		07/24/07	07/24/07	BW	Gross Alpha in Solids	
07/11/07	100-D-14		SOLID 7825-003	93B/93		07/24/07	07/24/07	BW	Gross Beta in Solids	
07/13/07	RC-075-001	RC-075	7825-003	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
			7825-003	SR		08/10/07	08/15/07	BW	Total Strontium in Solids	
'07073-04	Lab Control Sample		7825-004	93A/93		07/24/07	07/24/07	BW	Gross Alpha in Solids	
			SOLID 7825-004	93B/93		07/24/07	07/24/07	BW	Gross Beta in Solids	
		RC-075	7825-004	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
'07073-05	Method Blank		7825-005	93A/93		07/26/07	07/24/07	BW	Gross Alpha in Solids	
			SOLID 7825-005	93B/93		07/26/07	07/24/07	BW	Gross Beta in Solids	
		RC-075	7825-005	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
'07073-06	Duplicate (R707073-01)		7825-006	93A/93		07/24/07	07/24/07	BW	Gross Alpha in Solids	
07/11/07	100-D-14		SOLID 7825-006	93B/93		07/24/07	07/24/07	BW	Gross Beta in Solids	
07/13/07		RC-075	7825-006	GAM		07/20/07	07/24/07	MWT	Gamma Scan	
'07073-07	Lab Control Sample		7825-007	SR		08/10/07	08/15/07	BW	Total Strontium in Solids	
			SOLID							
		RC-075								
'07073-08	Method Blank		7825-008	SR		08/10/07	08/15/07	BW	Total Strontium in Solids	
			SOLID							
		RC-075								
'07073-09	Duplicate (R707073-01)		7825-009	SR		08/10/07	08/15/07	BW	Total Strontium in Solids	
07/11/07	100-D-14		SOLID							
07/13/07		RC-075								

WORK SUMMARY

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825

Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford

Contract No. 630

Case no SDG K0870

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTAL
93A/93	RC-075	Gross Alpha in Solids	900.0_ALPHABETA_GPC	3	1	1	1	6
93B/93	RC-075	Gross Beta in Solids	900.0_ALPHABETA_GPC	3	1	1	1	6
GAM	RC-075	Gamma Scan	GAMMA_GS	3	1	1	1	6
SR	RC-075	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	3	1	1	1	6
TOTALS				12	4	4	4	24

WORK SUMMARY

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Version 3.06

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0870

7825-005

Method Blank

METHOD BLANK

SDG <u>7825</u>	Client/Case no <u>Hanford</u>	<u>SDG K0870</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R707073-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7825-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-075</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-1.31	4.5	9.54	10.0	U	93A
Gross Beta	12587-47-2	-1.99	5.0	8.87	15.0	U	93B
Potassium 40	13966-00-2	U		0.883		U	GAM
Cobalt 60	10198-40-0	U		<u>0.052</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.052	0.100	U	GAM
Radium 226	13982-63-3	U		0.096	0.100	U	GAM
Radium 228	15262-20-1	U		<u>0.230</u>	0.200	U	GAM
Europium 152	14683-23-9	U		<u>0.137</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.139</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.103</u>	0.100	U	GAM
Thorium 228	14274-82-9	U		0.075		U	GAM
Thorium 232	TH-232	U		0.230		U	GAM
Uranium 235	15117-96-1	U		0.166		U	GAM
Uranium 238	U-238	U		5.53		U	GAM
Americium 241	14596-10-2	U		0.179		U	GAM

100-D/DR Burial Grounds & Remaining

QC-BLANK #62046

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0870

7825-008

Method Blank

METHOD BLANK

SDG <u>7825</u>	Client/Case no <u>Hanford</u>	SDG <u>K0870</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R707073-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7825-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-075</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	<u>-0.120</u>	0.096	0.225	1.00	U	SR

100-D/DR Burial Grounds & Remaining

QC-BLANK #62236

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>08/16/07</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

7825-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7825</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R707073-04</u> Dept sample id <u>7825-004</u>	Client/Case no <u>Hanford</u> <u>SDG K0870</u> Contract No. <u>630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>RC-075</u>
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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
Gross Alpha	112	17	9.48	10.0	93A	101	4.0	111	58-142	70-130
Gross Beta	95.8	7.7	6.35	15.0	93B	95.2	3.8	101	74-126	80-120
Cobalt 60	2.55	0.21	<u>0.089</u>	0.050	GAM	2.20	0.088	116	70-130	80-120
Cesium 137	2.53	0.18	<u>0.103</u>	0.100	GAM	2.17	0.087	117	70-130	80-120

100-D/DR Burial Grounds & Remaining

QC-LCS #62045

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>08/16/07</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY, GROUP K0870

7825-007

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7825</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R707073-07</u> Dept sample id <u>7825-007</u>	Client/Case no <u>Hanford</u> <u>SDG K0870</u> Contract <u>No. 630</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>RC-075</u>
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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	9.84	0.51	0.207	1.00	SR	9.51	0.38	104	82-118	80-120

100-D/DR Burial Grounds & Remaining

QC-LCS #62235

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>08/16/07</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

7825-006

J155Y5

DUPLICATE

SDG <u>7825</u> Contact <u>Melissa C. Mannion</u> Lab sample id <u>R707073-06</u> Dept sample id <u>7825-006</u> % solids <u>92.9</u>	ORIGINAL Lab sample id <u>R707073-01</u> Dept sample id <u>7825-001</u> Received <u>07/13/07</u> % solids <u>92.9</u>	Client/Case no <u>Hanford</u> SDG <u>K0870</u> Contract No. <u>630</u> Client sample id <u>J155Y5</u> Location/Matrix <u>100-D-14</u> <u>SOLID</u> Collected/Weight <u>07/11/07 10:01</u> <u>492 g</u> Custody/SAF No <u>RC-075-001</u> <u>RC-075</u>
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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	o
Gross Alpha	12.6	7.3	8.68	10.0		93A	10.0	7.3	9.96		23	144	0.5
Gross Beta	37.5	5.7	6.48	15.0		93B	29.1	6.2	8.89		25	50	1.5
Potassium 40	6.39	2.9	0.846			GAM	6.45	2.8	0.955		1	99	0
Cobalt 60	U		<u>0.098</u>	0.050	U	GAM	U		<u>0.100</u>	U	-		0
Cesium 137	U		<u>0.102</u>	0.100	U	GAM	U		0.094	U	-		0.1
Radium 226	U		<u>0.376</u>	0.100	U	GAM	0.417	0.19	<u>0.166</u>		10	162	0.2
Radium 228	0.544	0.35	<u>0.358</u>	0.200		GAM	0.369	0.29	<u>0.276</u>		38	153	0.8
Europium 152	U		<u>0.276</u>	0.100	U	GAM	U		<u>0.248</u>	U	-		0.1
Europium 154	U		<u>0.337</u>	0.100	U	GAM	U		<u>0.313</u>	U	-		0.1
Europium 155	U		<u>0.207</u>	0.100	U	GAM	U		<u>0.206</u>	U	-		0
Thorium 228	0.593	0.18	0.181			GAM	0.674	0.16	0.157		13	65	0.6
Thorium 232	0.544	0.35	0.358			GAM	0.369	0.29	0.276		38	153	0.8
Uranium 235	U		0.366		U	GAM	U		0.352	U	-		0.1
Uranium 238	U		11.9		U	GAM	U		11.3	U	-		0.1
Americium 241	U		0.100		U	GAM	U		0.189	U	-		0.8

100-D/DR Burial Grounds & Remaining

QC-DUP#1 62047

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DUP
 Version 3.06
 Report date 08/16/07

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY, GROUP K0870

7825-009

J155Y5

DUPLICATE

SDG <u>7825</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R707073-09</u> Dept sample id <u>7825-009</u> % solids <u>92.9</u>	ORIGINAL Lab sample id <u>R707073-01</u> Dept sample id <u>7825-001</u> Received <u>07/13/07</u> % solids <u>92.9</u>	Client/Case no <u>Hanford</u> <u>SDG K0870</u> Contract <u>No. 630</u> Client sample id <u>J155Y5</u> Location/Matrix <u>100-D-14</u> <u>SOLID</u> Collected/Weight <u>07/11/07 10:01</u> <u>492 g</u> Custody/SAF No <u>RC-075-001</u> <u>RC-075</u>
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ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	DER σ
Total Strontium	-0.094	0.11	0.246	1.00	U	SR	0.001	0.096	0.191	U	-	1.3	

100-D/DR Burial Grounds & Remaining

QC-DUP#1.62237

DUPLICATES

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 Form DVD-DUP
 Version 3.06
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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0870

7825-001

J155Y5

DATA SHEET

SDG <u>7825</u>	Client/Case no <u>Hanford</u>	<u>SDG K0870</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R707073-01</u>	Client sample id <u>J155Y5</u>	
Dept sample id <u>7825-001</u>	Location/Matrix <u>100-D-14</u>	<u>SOLID</u>
Received <u>07/13/07</u>	Collected/Weight <u>07/11/07 10:01</u>	<u>492 g</u>
% solids <u>92.9</u>	Custody/SAF No <u>RC-075-001</u>	<u>RC-075</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	10.0	7.3	9.96	10.0		93A
Gross Beta	12587-47-2	29.1	6.2	8.89	15.0		93B
Total Strontium	SR-RAD	0.001	0.096	0.191	1.00	U	SR
Potassium 40	13966-00-2	6.45	2.8	0.955			GAM
Cobalt 60	10198-40-0	U		<u>0.100</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.094	0.100	U	GAM
Radium 226	13982-63-3	0.417	0.19	<u>0.166</u>	0.100		GAM
Radium 228	15262-20-1	0.369	0.29	<u>0.276</u>	0.200		GAM
Europium 152	14683-23-9	U		<u>0.248</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.313</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.206</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.674	0.16	0.157			GAM
Thorium 232	TH-232	0.369	0.29	0.276			GAM
Uranium 235	15117-96-1	U		0.352		U	GAM
Uranium 238	U-238	U		11.3		U	GAM
Americium 241	14596-10-2	U		0.189		U	GAM

100-D/DR Burial Grounds & Remaining

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>08/16/07</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY .GROUP K0870

7825-002

J155Y6

DATA SHEET

SDG <u>7825</u>	Client/Case no <u>Hanford</u>	SDG <u>K0870</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R707073-02</u>	Client sample id <u>J155Y6</u>	
Dept sample id <u>7825-002</u>	Location/Matrix <u>100-D-14</u>	<u>SOLID</u>
Received <u>07/13/07</u>	Collected/Weight <u>07/11/07 10:01</u>	<u>553 g</u>
% solids <u>93.0</u>	Custody/SAF No <u>RC-075-001</u>	<u>RC-075</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	10.6	7.4	<u>10.1</u>	10.0		93A
Gross Beta	12587-47-2	24.9	5.9	8.70	15.0		93B
Total Strontium	SR-RAD	-0.014	0.10	0.212	1.00	U	SR
Potassium 40	13966-00-2	7.76	3.2	0.872			GAM
Cobalt 60	10198-40-0	U		<u>0.073</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		0.082	0.100	U	GAM
Radium 226	13982-63-3	0.396	0.16	<u>0.137</u>	0.100		GAM
Radium 228	15262-20-1	0.548	0.33	<u>0.303</u>	0.200		GAM
Europium 152	14683-23-9	U		<u>0.209</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.218</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.208</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.519	0.13	0.144			GAM
Thorium 232	TH-232	0.548	0.33	0.303			GAM
Uranium 235	15117-96-1	U		0.318		U	GAM
Uranium 238	U-238	U		8.14		U	GAM
Americium 241	14596-10-2	U		0.294		U	GAM

100-D/DR Burial Grounds & Remaining

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0870

7825-003

J155Y7

DATA SHEET

SDG <u>7825</u>	Client/Case no <u>Hanford</u>	SDG <u>K0870</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R707073-03</u>	Client sample id <u>J155Y7</u>	
Dept sample id <u>7825-003</u>	Location/Matrix <u>100-D-14</u>	<u>SOLID</u>
Received <u>07/13/07</u>	Collected/Weight <u>07/11/07 10:14</u>	<u>568 g</u>
% solids <u>96.4</u>	Custody/SAF No <u>RC-075-001</u>	<u>RC-075</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	3.36	5.3	8.52	10.0	U	93A
Gross Beta	12587-47-2	24.5	4.5	5.40	15.0		93B
Total Strontium	SR-RAD	0.079	0.11	0.215	1.00	U	SR
Potassium 40	13966-00-2	5.83	3.0	1.14			GAM
Cobalt 60	10198-40-0	U		<u>0.097</u>	0.050	U	GAM
Cesium 137	10045-97-3	0.141	0.089	0.089	0.100		GAM
Radium 226	13982-63-3	0.315	0.20	<u>0.168</u>	0.100		GAM
Radium 228	15262-20-1	U		<u>0.727</u>	0.200	U	GAM
Europium 152	14683-23-9	U		<u>0.253</u>	0.100	U	GAM
Europium 154	15585-10-1	U		<u>0.318</u>	0.100	U	GAM
Europium 155	14391-16-3	U		<u>0.201</u>	0.100	U	GAM
Thorium 228	14274-82-9	0.395	0.13	0.128			GAM
Thorium 232	TH-232	U		0.727		U	GAM
Uranium 235	15117-96-1	U		0.374		U	GAM
Uranium 238	U-238	U		11.5		U	GAM
Americium 241	14596-10-2	U		0.098		U	GAM

100-D/DR Burial Grounds & Remaining

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

Test SR Matrix SOLID
 SDG 7825
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG K0870

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS
 BETA COUNTING

RESULTS

AB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
reparation batch 6109-193				
707073-01		7825-001	J155Y5	U
707073-02		7825-002	J155Y6	U
707073-03		7825-003	J155Y7	U
707073-07		7825-007	LCS (QC ID=62235)	ok
707073-08		7825-008	BLK (QC ID=62236)	U
707073-09		7825-009	Duplicate (R707073-01)	- U

ominal values and limits from method RDLs (pCi/g) 1.00
 00-D/DR Burial Grounds & Remaining

METHOD PERFORMANCE

AB	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
reparation batch 6109-193			2σ prep error 10.0 % Reference Lab Notebook #6092, pg. 193												
707073-01		J155Y5	0.191	1.00			97	120			30	08/10/07	08/10	GRB-228	
707073-02		J155Y6	0.212	1.00			95	100			30	08/10/07	08/10	GRB-227	
707073-03		J155Y7	0.215	1.00			88	100			30	08/10/07	08/10	GRB-228	
707073-07		LCS (QC ID=62235)	0.207	1.00			94	100				08/10/07	08/10	GRB-217	
707073-08		BLK (QC ID=62236)	0.225	1.00			89	100				08/10/07	08/10	GRB-218	
707073-09		Duplicate (R707073-01)	0.246	1.00			86	100			30	08/10/07	08/10	GRB-219	
		(QC ID=62237)													
ominal values and limits from method			1.00	1.00			30-105	100			180				

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
SPP-061	Determination of Moisture Content in Solid Samples rev 0	
SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 5	
SPP-060	Soil Preparation, rev 0	
CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1	

AVERAGES ± 2 SD	MDA <u>0.216 ± 0.037</u>
FOR 6 SAMPLES	YIELD <u>92 ± 9</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

LAB METHOD SUMMARY

GROSS ALPHA IN SOLIDS
GAS PROPORTIONAL COUNTING

Test 93A Matrix SOLID
SDG 7825
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG K0870

RESULTS

LAB	RAW	SUF-	AMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha
reparation batch 6109-193							
			707073-01	93	7825-001	J155Y5	10.0
			707073-02	93	7825-002	J155Y6	10.6
			707073-03	93	7825-003	J155Y7	U
			707073-04	93	7825-004	LCS (QC ID=62045)	ok
			707073-05	93	7825-005	BLK (QC ID=62046)	U
			707073-06	93	7825-006	Duplicate (R707073-01)	ok
Minimal values and limits from method							
30-D/DR Burial Grounds & Remaining						RDLs (pCi/g)	10.0

METHOD PERFORMANCE

LAB	RAW	SUF-	AMPLE ID	TEST FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
reparation batch 6109-193 2σ prep error 20.0 % Reference Lab Notebook #6092, pg. 193																	
			707073-01	93	J155Y5	9.96	0.100			62	100			13	07/23/07	07/24	GRB-213
			707073-02	93	J155Y6	<u>10.1</u>	0.100			56	100			13	07/23/07	07/24	GRB-214
			707073-03	93	J155Y7	8.52	0.100			61	100			13	07/23/07	07/24	GRB-216
			707073-04	93	LCS (QC ID=62045)	9.48	0.100			59	100				07/23/07	07/24	GRB-110
			707073-05	93	BLK (QC ID=62046)	9.54	0.100			59	100				07/23/07	07/26	GRB-213
			707073-06	93	Duplicate (R707073-01) (QC ID=62047)	8.68	0.100			61	100			13	07/23/07	07/24	GRB-115
Minimal values and limits from method																	
						10.0	0.100			5-250	100			180			

PROCEDURES REFERENCE 900.0_ALPHA_BETA_GPC
SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
SPP-125 Gross Alpha and Gross Beta in Dissolved Solids,
rev 0

AVERAGES ± 2 SD MDA 9.38 ± 1.30
FOR 6 SAMPLES RESIDUE 60 ± 4

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

Test 93B Matrix SOLID
 SDG 7825
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG K0870

LAB METHOD SUMMARY

GROSS BETA IN SOLIDS
 GAS PROPORTIONAL COUNTING

RESULTS

LAB	RAW	SUF-	AMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Gross Beta
reparation batch 6109-193							
			707073-01	93	7825-001	J155Y5	29.1
			707073-02	93	7825-002	J155Y6	24.9
			707073-03	93	7825-003	J155Y7	24.5
			707073-04	93	7825-004	LCS (QC ID=62045)	ok
			707073-05	93	7825-005	BLK (QC ID=62046)	U
			707073-06	93	7825-006	Duplicate (R707073-01)	ok

Minimal values and limits from method RDLs (pCi/g) 15.0
 30-D/DR Burial Grounds & Remaining

METHOD PERFORMANCE

LAB	RAW	SUF-	AMPLE ID	TEST FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR	
reparation batch 6109-193						2σ prep error 15.0 % Reference Lab Notebook #6092, pg. 193													
			707073-01	93	J155Y5	8.89	0.100			62		100			13	07/23/07	07/24	GRB-213	
			707073-02	93	J155Y6	8.70	0.100			56		100			13	07/23/07	07/24	GRB-214	
			707073-03	93	J155Y7	5.40	0.100			61		100			13	07/23/07	07/24	GRB-216	
			707073-04	93	LCS (QC ID=62045)	6.35	0.100			59		100				07/23/07	07/24	GRB-110	
			707073-05	93	BLK (QC ID=62046)	8.87	0.100			59		100				07/23/07	07/26	GRB-213	
			707073-06	93	Duplicate (R707073-01)	6.48	0.100			61		100			13	07/23/07	07/24	GRB-115	
					(QC ID=62047)														

Minimal values and limits from method 15.0 0.100 5-250 100 180

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
 SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 5
 SPP-125 Gross Alpha and Gross Beta in Dissolved Solids, rev 0

AVERAGES ± 2 SD MDA 7.45 ± 3.10
 FOR 6 SAMPLES RESIDUE 60 ± 4

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0870

Test GAM Matrix SOLID
 SDG 7825
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG K0870

LAB METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

RESULTS

AB	RAW	SUF-				
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137	
reparation batch 6109-193						
707073-01		7825-001	J155Y5	U	U	
707073-02		7825-002	J155Y6	U	U	
707073-03		7825-003	J155Y7	U	0.141	
707073-04		7825-004	LCS (QC ID=62045)	ok	ok	
707073-05		7825-005	BLK (QC ID=62046)	U	U	
707073-06		7825-006	Duplicate (R707073-01)	- U	- U	

nominal values and limits from method RDLs (pCi/g) 0.050 0.100
 30-D/DR Burial Grounds & Remaining

METHOD PERFORMANCE

AB	RAW	SUF-	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
reparation batch 6109-193 2σ prep error 15.0 % Reference Lab Notebook #6092, pg. 193															
707073-01		J155Y5	<u>23.4</u>	220					104			9	07/13/07	07/20	JR,02,00
707073-02		J155Y6	<u>18.5</u>	223					106			9	07/13/07	07/20	JR,08,00
707073-03		J155Y7	<u>23.2</u>	220					106			9	07/13/07	07/20	JR,06,00
707073-04		LCS (QC ID=62045)	<u>0.089</u>	220					100				07/13/07	07/20	JR,05,00
707073-05		BLK (QC ID=62046)	<u>13.6</u>	220					106				07/13/07	07/20	JR,05,00
707073-06		Duplicate (R707073-01)	<u>21.8</u>	220					103			9	07/13/07	07/20	JR,06,00
		(QC ID=62047)													

nominal values and limits from method 0.050 220 100 180

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

AVERAGES ± 2 SD MDA 16.8 ± 17.9
 FOR 6 SAMPLES YIELD _____ ± _____

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K0870

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 K0870

SDG 7825
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K0870

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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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0870

SDG 7825
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG K0870

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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SAMPLE DELIVERY GROUP K0870

SDG 7825

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 630

Case no SDG K0870

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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Protocol Hanford

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 08/16/07

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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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M E T H O D S U M M A R Y

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

The following notes apply to this report:

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

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

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

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

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

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

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

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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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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-075-001 Page 1 of 1	
Collector D.W.Shea / P. Moorman (SEC) Caldwell		Company Contact D.W.Shea	Telephone No. 521-6014	Project Coordinator KESSNER, JH	Price Code 8K	Data Turnaround 15 days
Project Designation 100-D/DR Burial Grounds & Remaining Sites - Soil Full Prot		Sampling Location 100-D-14 K0870 (7825)		SAF No. RC-075		
Ice Chest No. AFS 04-123		Field Logbook No. EL-1607-2	COA C00D14A000	Method of Shipment Fed EX		
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. see OPSC A070357		Bill of Lading/Air Bill No. see O5PC		

Special Handling and/or Storage	Preservation	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None		
	Type of Container	G/P	G/P	aG	aG	aG	G/P	G/P		
	No. of Container(s)	1	1	1	1	1	1	10	7-12-07	
	Volume	250mL	125mL	125mL	60mL	120mL	500mL	20g		

SAMPLE ANALYSIS	See item (1) in Special Instructions.	IC Anions - 300.0; pH (Soil) - 9.045 4 item 2	Pesticides - 8081 DWS 7/11/07	PCBs - 8082	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (TCL List)	Gross Alpha; Gross Beta		
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Sample No.	Matrix *	Sample Date	Sample Time						
J155Y4	SOIL	7/11/07	0951	✓	✓	✓	✓	✓	DWS 7/11/07
J155Y5	SOIL		1001	✓	✓	✓	✓	✓	
J155Y6	SOIL		1001	✓	✓	✓	✓	✓	
J155Y7	SOIL		1014	✓	✓	✓	✓	✓	
J155Y8	SOIL	DWS 7/11/07		✓	✓	✓	✓	✓	

CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From DWShea DWSHEA	Date/Time 7/11/07 1020	Received By/Stored In John Caldwell (SEC)	Date/Time 7/11/07	Relinquished By/Removed From DWShea DWSHEA	Date/Time 7/11/07 1011	Received By/Stored In Fridge 3A	Date/Time 7/11/07 1011	(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Uranium, Vanadium, Zinc) (2) nitrate/nitrite via 353.2 Sampler unavailable to relinquish samples from 3728 Ref # 3A 3728 Custodian removed samples for shipping on 7/12/07.				S=Soil SE=Settlement S(S)=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids L=Liquid V=Vegetation N=Other
Relinquished By/Removed From Fridge 3A	Date/Time 7-12-07 0930	Received By/Stored In KMSingleton	Date/Time 7-12-07 0930	Relinquished By/Removed From KMSingleton	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500					
Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500	Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500					
Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500	Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500					
Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500	Relinquished By/Removed From FED EX	Date/Time 7-12-07 1500	Received By/Stored In FED EX	Date/Time 7-12-07 1500					

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 MCHLAND State WA
 Date/Time received 07/13/07 9:15 CoC No. PC-075-001
 Container I.D. No. AFS-04-123 Requested TAT (Days) 15 P.O. Received Yes [] No []

INSPECTION

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

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
 15. Inspected by MFH Date: 07/13/07 Time: 9:30

Customer Sample No.	cpm	mR/hr	Wide	Customer Sample No.	cpm	mR/hr	Wide

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