



EBERLINE
SERVICES

0059159

December 27, 2002

Ms. Joan Kessner
Bechtel Hanford Inc.
3350 George Washington Way
Richland, WA 99352
MSIN: H0-25

Reference: **P.O. #630**
Eberline Services R2-11-097-7397, SDG H1980

Dear Ms. Kessner:

Enclosed is the data report for one water sample designated under SAF No. B00-056 received at Eberline Services on November 20, 2002. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package

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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1980 was composed of one water sample designated under SAF No. B00-056 with a Project Designation of: 100-NR-1 TSD Sites R.A. Sampling – Water.

Due to the limited sample volume (0.024 L) received at the laboratory, sample J00865 was treated as an other liquid. The data is in units of picoCurie per milliLiter (pCi/mL).

The sample was 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 BHI via e-Fax on December 5 and 6, 2002.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy Analyses

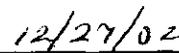
No problems were encountered during the course of the analyses.

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
Program Manager



Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG_H1980

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

T A B L E O F C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	11
Report Guides	.	.	.	15
End of Section	.	.	.	29

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 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1980

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
Contract No. 630
Case no SDG H1980

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

SAMPLE SUMMARY

SDG 7397
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Case no SDG H1980

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
J00865	116-N-1 Crib Inlet Pipe	LIQUID		R211097-01	800-056	800-056-039	11/15/02 10:45
Method Blank		LIQUID		R211097-03	800-056		
Lab Control Sample		LIQUID		R211097-02	800-056		
Duplicate (R211097-01)	116-N-1 Crib Inlet Pipe	LIQUID		R211097-04	800-056		11/15/02 10:45

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H1980

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
7397	B00-056-039	J00865	LIQUID		0.024 L		11/20/02 5	R211097-01		7397-001
		Method Blank	LIQUID					R211097-03		7397-003
		Lab Control Sample	LIQUID					R211097-02		7397-002
		Duplicate (R211097-01)	LIQUID		0.024 L		11/20/02 5	R211097-04		7397-004

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H1980

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Beta Counting										
SR	LIQUID	Total Strontium in Liquids	7052-084	10.0	1			1	1	1/1
Gas Proportional Counting										
93A	LIQUID	Gross Alpha in Liquid	7052-084	20.0	1			1	1	1/1
93B	LIQUID	Gross Beta in Liquid	7052-084	15.0	1			1	1	1/1
Gamma Spectroscopy										
GAM	LIQUID	Gamma Scan in Liquid	7052-084	10.0	1			1	1	1/1

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

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1980

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
J00865		R211097-01	7397-001	93A/93		12/03/02	12/05/02	MCM	Gross Alpha in Liquid	
116-N-1 Crib Inlet Pipe	LIQUID	11/15/02	7397-001	93B/93		12/03/02	12/05/02	MCM	Gross Beta in Liquid	
800-056-039	800-056	11/20/02	7397-001	GAM		12/05/02	12/06/02	MCM	Gamma Scan in Liquid	
			7397-001	SR		11/30/02	12/05/02	MCM	Total Strontium in Liquids	
Method Blank		R211097-03	7397-003	93A/93		12/02/02	12/05/02	MCM	Gross Alpha in Liquid	
	LIQUID		7397-003	93B/93		12/02/02	12/05/02	MCM	Gross Beta in Liquid	
	800-056		7397-003	GAM		12/05/02	12/06/02	MCM	Gamma Scan in Liquid	
			7397-003	SR		11/30/02	12/05/02	MCM	Total Strontium in Liquids	
Lab Control Sample		R211097-02	7397-002	93A/93		12/03/02	12/05/02	MCM	Gross Alpha in Liquid	
	LIQUID		7397-002	93B/93		12/03/02	12/05/02	MCM	Gross Beta in Liquid	
	800-056		7397-002	GAM		12/05/02	12/06/02	MCM	Gamma Scan in Liquid	
			7397-002	SR		11/30/02	12/05/02	MCM	Total Strontium in Liquids	
Duplicate (R211097-01)		R211097-04	7397-004	93A/93		12/03/02	12/05/02	MCM	Gross Alpha in Liquid	
116-N-1 Crib Inlet Pipe	LIQUID	11/15/02	7397-004	93B/93		12/03/02	12/05/02	MCM	Gross Beta in Liquid	
	800-056	11/20/02	7397-004	GAM		12/05/02	12/06/02	MCM	Gamma Scan in Liquid	
			7397-004	SR		11/30/02	12/05/02	MCM	Total Strontium in Liquids	

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	800-056	Gross Alpha in Liquid	900.0_ALPHABETA_GPC	1			1	1	1		4
93B/93	800-056	Gross Beta in Liquid	900.0_ALPHABETA_GPC	1			1	1	1		4
GAM	800-056	Gamma Scan in Liquid	GAMMA_GS	1			1	1	1		4
SR	800-056	Total Strontium in Liquids	SRTOT_SEP_PRECIP_GPC	1			1	1	1		4
TOTALS				4			4	4	4		16

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1980

R211097-03

Method Blank

METHOD BLANK

SDG <u>7397</u>	Client/Case no <u>Hanford</u>	SDG <u>H1980</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211097-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7397-003</u>	Material/Matrix <u>LIQUID</u>	
	SAF No <u>B00-056</u>	

ANALYTE	CAS NO	RESULT pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.013	0.062	0.14	10	U	93A
Gross Beta	12587-47-2	-0.037	0.16	0.28	15	U	93B
Total Strontium	SR-RAD	0.021	0.068	0.13	1.0	U	SR
Potassium 40	13966-00-2	U		6.9		U	GAM
Cobalt 58	13981-38-9	U		<u>0.37</u>	0.050	U	GAM
Iron 59	14596-12-4	U		0.62		U	GAM
Cobalt 60	10198-40-0	U		<u>0.49</u>	0.050	U	GAM
Cesium 137	10045-97-3	U		<u>0.47</u>	0.10	U	GAM
Radium 226	13982-63-3	U		<u>0.74</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>1.5</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>1.2</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>1.0</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.83</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.75		U	GAM
Thorium 232	TH-232	U		1.5		U	GAM
Uranium 235	15117-96-1	U		1.2		U	GAM
Uranium 238	U-238	U		60		U	GAM
Americium 241	14596-10-2	U		0.93		U	GAM

100-NR-1 TSD Sites R.A. Smpl. - H20

QC-BLANK 43227

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>12/06/02</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

R211097-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7397</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG <u>H1980</u> Contract <u>No. 630</u>
Lab sample id <u>R211097-02</u> Dept sample id <u>7397-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>LIQUID</u> SAF No <u>B00-056</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/mL	(COUNT)	pCi/mL	pCi/mL	FIERS TEST	pCi/mL	pCi/mL	%	(TOTAL)	LIMITS
Gross Alpha	11.8	0.79	0.19	10	93A	10.6	0.42	111	64-136	70-130
Gross Beta	12.5	0.58	0.32	15	93B	11.6	0.46	108	74-126	70-130
Total Strontium	11.7	0.49	0.16	1.0	SR	11.1	0.44	105	82-118	80-120
Cobalt 60	15.8	0.95	<u>0.42</u>	0.050	GAM	16.4	0.66	96	82-118	80-120
Cesium 137	21.7	0.90	<u>0.54</u>	0.10	GAM	21.3	0.85	102	82-118	80-120

100-NR-1 TSD Sites R.A. Smpl. - H20

QC-LCS 43226

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>12/06/02</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

R211097-04

J00865

DUPLICATE

SDG <u>7397</u>	Client/Case no <u>Hanford</u>	SDG <u>H1980</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R211097-04</u>	Lab sample id <u>R211097-01</u>	Client sample id <u>J00865</u>
Dept sample id <u>7397-004</u>	Dept sample id <u>7397-001</u>	Location/Matrix <u>116-N-1 Crib Inlet Pipe LIQUID</u>
	Received <u>11/20/02</u>	Collected/Volume <u>11/15/02 10:45 0.024 L</u>
		Custody/SAF No <u>800-056-039 800-056</u>

ANALYTE	DUPLICATE pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI- FIERS	TEST	ORIGINAL pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	0.256	0.25	0.12	10		93A	0.178	0.24	0.12		36	243	
Gross Beta	62.7	1.2	0.28	15		93B	65.8	1.2	0.25		5	32	
Total Strontium	35.3	0.87	0.17	1.0		SR	34.2	0.80	0.14		3	22	
Potassium 40	U		9.0		U	GAM	U		10	U	-		
Cobalt 58	U		0.94	0.050	U	GAM	U		1.0	U	-		
Iron 59	U		2.1		U	GAM	U		2.6	U	-		
Cobalt 60	10.3	1.4	0.75	0.050		GAM	11.4	1.7	0.83		10	37	
Cesium 137	1.78	0.68	0.77	0.10		GAM	1.97	0.64	0.70		10	78	
Radium 226	U		1.1	0.10	U	GAM	U		1.6	U	-		
Radium 228	U		3.4	0.20	U	GAM	U		3.2	U	-		
Europium 152	U		1.6	0.10	U	GAM	U		1.7	U	-		
Europium 154	U		1.4	0.10	U	GAM	U		2.0	U	-		
Europium 155	U		1.0	0.10	U	GAM	U		1.4	U	-		
Thorium 228	U		0.68		U	GAM	U		0.87	U	-		
Thorium 232	U		3.4		U	GAM	U		3.2	U	-		
Uranium 235	U		1.8		U	GAM	U		2.1	U	-		
Uranium 238	U		100		U	GAM	U		120	U	-		
Americium 241	U		1.3		U	GAM	U		1.7	U	-		

100-NR-1 TSD Sites R.A. Smpl. - H20

QC-DUP#1 43228

Note: Sample pH - 6.0

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1980

R211097-01

J00865

DATA SHEET

SDG <u>7397</u>	Client/Case no <u>Hanford</u>	SDG <u>H1980</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211097-01</u>	Client sample id <u>J00865</u>	
Dept sample id <u>7397-001</u>	Location/Matrix <u>116-N-1 Crib Inlet Pipe LIQUID</u>	
Received <u>11/20/02</u>	Collected/Volume <u>11/15/02 10:45 0.024 L</u>	
	Custody/SAF No <u>B00-056-039 B00-056</u>	

ANALYTE	CAS NO	RESULT pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.178	<u>0.24</u>	0.12	10		93A
Gross Beta	12587-47-2	65.8	1.2	0.25	15		93B
Total Strontium	SR-RAD	34.2	0.80	0.14	1.0		SR
Potassium 40	13966-00-2	U		10		U	GAM
Cobalt 58	13981-38-9	U		<u>1.0</u>	0.050	U	GAM
Iron 59	14596-12-4	U		2.6		U	GAM
Cobalt 60	10198-40-0	11.4	1.7	<u>0.83</u>	0.050		GAM
Cesium 137	10045-97-3	1.97	0.64	<u>0.70</u>	0.10		GAM
Radium 226	13982-63-3	U		<u>1.6</u>	0.10	U	GAM
Radium 228	15262-20-1	U		<u>3.2</u>	0.20	U	GAM
Europium 152	14683-23-9	U		<u>1.7</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>2.0</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>1.4</u>	0.10	U	GAM
Thorium 228	14274-82-9	U		0.87		U	GAM
Thorium 232	TH-232	U		3.2		U	GAM
Uranium 235	15117-96-1	U		2.1		U	GAM
Uranium 238	U-238	U		120		U	GAM
Americium 241	14596-10-2	U		1.7		U	GAM

100-NR-1 TSD Sites R.A. Smpl. - H20

Note: Sample pH - 6.0

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>12/06/02</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

METHOD SUMMARY

TOTAL STRONTIUM IN LIQUIDS
BETA COUNTING

Test SR Matrix LIQUID
SDG 7397
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H1980

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 7052-084					
J00865	R211097-01			7397-001	34.2
BLK (QC ID=43227)	R211097-03			7397-003	U
LCS (QC ID=43226)	R211097-02			7397-002	ok
Duplicate (R211097-01)	R211097-04			7397-004	ok
Nominal values and limits from method		RDLs (pCi/mL)		1.0	
100-NR-1 TSD Sites R.A. Smpl. - H20					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/mL	ALIQ mL	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR	
Preparation batch 7052-084 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 084																
J00865	R211097-01			0.14	2.01			85	100				15	11/30/02	GRB-205	
BLK (QC ID=43227)	R211097-03			0.13	2.01			81	100				11/30/02	11/30	GRB-204	
LCS (QC ID=43226)	R211097-02			0.16	2.01			76	100				11/30/02	11/30	GRB-207	
Duplicate (R211097-01)	R211097-04			0.17	2.01			70	100				15	11/30/02	11/30	GRB-221
(QC ID=43228)																
Nominal values and limits from method				1.0	2.01					100	180					

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
CP-071 Soil Dissolution, > 1.0g Aliquot, rev 2
CP-501 Strontium in Water Samples, rev 4

AVERAGES ± 2 SD MDA 0.15 ± 0.037
FOR 4 SAMPLES YIELD 78 ± 13

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/06/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

Test 93A Matrix LIQUID
 SDG 7397
 Contact Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN LIQUID
 GAS PROPORTIONAL COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H1980

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Alpha
Preparation batch 7052-084					
J00865	R211097-01	93		7397-001	0.178
BLK (QC ID=43227)	R211097-03	93		7397-003	U
LCS (QC ID=43226)	R211097-02	93		7397-002	ok
Duplicate (R211097-01)	R211097-04	93		7397-004	ok
Nominal values and limits from method		RDIs (pCi/mL)		10	
100-NR-1 TSD Sites R.A. Smpl. - H2O					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7052-084 2σ prep error 20.0 % Reference Lab Notebook 7052 pg. 084																
J00865	R211097-01	93		0.12	2.02			8	100				18	11/27/02	12/03	GRB-101
BLK (QC ID=43227)	R211097-03	93		0.14	2.02			23	100					11/27/02	12/02	GRB-111
LCS (QC ID=43226)	R211097-02	93		0.19	2.02			24	100					11/27/02	12/03	GRB-115
Duplicate (R211097-01)	R211097-04	93		0.12	2.02			8	100				18	11/27/02	12/03	GRB-102
(QC ID=43228)																
Nominal values and limits from method				10	2.02			5-250	100				180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
 CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD MDA 0.14 ± 0.066
 FOR 4 SAMPLES RESIDUE 16 ± 18

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

METHOD SUMMARY

GROSS BETA IN LIQUID
GAS PROPORTIONAL COUNTING

Test 93B Matrix LIQUID
SDG 7397
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H1980

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Gross Beta
Preparation batch 7052-084					
J00865	R211097-01	93		7397-001	65.8
BLK (QC ID=43227)	R211097-03	93		7397-003	U
LCS (QC ID=43226)	R211097-02	93		7397-002	ok
Duplicate (R211097-01)	R211097-04	93		7397-004	ok
Nominal values and limits from method		RDLs (pCi/mL)		15	
100-NR-1 TSD Sites R.A. Smpl. - H20					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7052-084 2σ prep error 15.0 % Reference Lab Notebook 7052 pg. 084																
J00865	R211097-01	93		0.25	2.02			8	100				18	11/27/02	12/03	GRB-101
BLK (QC ID=43227)	R211097-03	93		0.28	2.02			23	100					11/27/02	12/02	GRB-111
LCS (QC ID=43226)	R211097-02	93		0.32	2.02			24	100					11/27/02	12/03	GRB-115
Duplicate (R211097-01)	R211097-04	93		0.28	2.02			8	100				18	11/27/02	12/03	GRB-102
(QC ID=43228)																
Nominal values and limits from method				15	2.02	5-250		100	180							

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD MDA 0.28 ± 0.057
FOR 4 SAMPLES RESIDUE 16 ± 18

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/06/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1980

METHOD SUMMARY

GAMMA SCAN IN LIQUID
GAMMA SPECTROSCOPY

Test GAM Matrix LIQUID
SDG 7397
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H1980

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7052-084					
J00865	R211097-01	7397-001		11.4	1.97
BLK (QC ID=43227)	R211097-03	7397-003		U	U
LCS (QC ID=43226)	R211097-02	7397-002		ok	ok
Duplicate (R211097-01)	R211097-04	7397-004		ok	ok
Nominal values and limits from method		RDLs (pCi/mL)		0.050	0.10
100-NR-1 TSD Sites R.A. Smpl. - H20					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/mL	ALIQ mL	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7052-084 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 084														
J00865	R211097-01		<u>2.6</u>	12.1				<u>88</u>			20	11/27/02	12/05	SP,03,00
BLK (QC ID=43227)	R211097-03		<u>0.62</u>	12.1				172				11/27/02	12/05	SP,03,00
LCS (QC ID=43226)	R211097-02		<u>0.42</u>	12.1				172				11/27/02	12/05	SP,04,00
Duplicate (R211097-01)	R211097-04		<u>2.1</u>	12.1				117			20	11/27/02	12/05	SP,03,00
(QC ID=43228)														
Nominal values and limits from method			0.050	12.1				100			180			

PROCEDURES REFERENCE GAMMA_GS
CP-100 Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD MDA 1.4 ± 2.2
FOR 4 SAMPLES YIELD _____ ± _____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1980

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 15

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H1980

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

R E P O R T G U I D E

Client Hanford
 Contract No. 630
 Case no SDG H1980

W O R K S U M M A R Y

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

The following notes apply to this report:

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

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

Page 17

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H1980

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).

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG H1980

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.

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

REPORT GUIDES

Page 5

SUMMARY DATA SECTION

Page 19

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H1980

DATA SHEET

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

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1980

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 21

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H1980

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.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG H1980

DUPLICATE

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

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

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

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

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 23

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H1980

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

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 24

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H1980

MATRIX SPIKE

for the recovery.

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

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

REPORT GUIDES

Page 11

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H1980

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'

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 26

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
 Contract No. 630
 Case no SDG H1980

METHOD SUMMARY

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

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 27

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H1980

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

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1980

SDG 7397
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG H1980

METHOD SUMMARY

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

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

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

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

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 29

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 12/06/02

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B00-056-039	Page 1 of 1
Collector R.B. Kerkow <i>RB 11-15-02</i>	Company Contact R.B. Kerkow	Telephone No. 372-2187 <i>H1980 (7397)</i>	Project Coordinator Trent, SJ		Price Code <i>7K</i>	Data Turnaround
Project Designation 100-NR-1 TSD Sites R. A. Sampling - Water	Sampling Location <i>116-N-1 CRAB INLET PIPE</i> (26" pipe at UPR-100N-31) <i>RB 10/28/02</i>		SAF No. B00-056	Air Quality <input type="checkbox"/> <i>15 DAYS</i>		
Ice Chest No.	Field Logbook No. EL-1524-2	COA R1301N2600	Method of Shipment Government Vehicle <i>FED EX</i> <i>DAS 11/19/02</i>			
Shipped To TMA/RECR <i>RB 11-15-02</i>	Offsite Property No. <i>A030053</i>		Bill of Lading/Air Bill No.			

POSSIBLE SAMPLE HAZARDS/REMARKS <i>Potentially Radioactive</i> <i>< 2,000 pCi/gm</i> Special Handling and/or Storage <i>None</i>	Preservation	<i>NONE</i>								
	Type of Container	<i>VIAL</i>								
	No. of Container(s)	<i>1</i>								
	Volume	<i>20ML</i>								
SAMPLE ANALYSIS		See item (1) in Special Instructions. <i>AND PH</i>								<i>TIETO:</i>
Sample No.	Matrix *	Sample Date	Sample Time							
<i>J00865</i>	<i>WATER</i>	<i>11-15-02</i>	<i>1045</i>	<i>X</i>					<i>J00864</i>	<i>12"</i>
	<i>Other liquid ~ Btl</i>	<i>11/23/02</i>								
	<i>J. Kerkow</i>									

CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From <i>RB Kerkow/RB Kerkow</i>	Date/Time <i>11/15/02</i>	Received By/Stored In <i>REF IA RB Kerkow</i>	Date/Time <i>11/15/02</i>	Lab COA: R1301N2F00	Fax results to RB Kerkow 372-8655			S=Soil SB=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue W=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>3728 Ref IA</i>	Date/Time <i>11/19/02</i>	Received By/Stored In <i>David St. John</i>	Date/Time <i>11/19/02</i>	(1) Gross Alpha; Gross Beta; Gamma Spectroscopy(Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Isotopic Plutonium-Americium-241; Strontium-89,90 - Total Sr; Nickel-63; Isotopic Uranium <i>RB 10/28/02</i>				
Relinquished By/Removed From <i>David St. John etc</i>	Date/Time <i>11/19/02</i>	Received By/Stored In <i>FED EX</i>	Date/Time <i>11/19/02</i>	<i>ADD: PH ANALYSIS RBK 10/28/02</i>				
Relinquished By/Removed From <i>FED EX</i>	Date/Time <i>11/20/02 9:55</i>	Received By/Stored In <i>Judd Davis</i>	Date/Time <i>11/20/02 9:55</i>	<i>DELETE: ISOTOPIC Pu, AM-241, Ni-63, ISOTOPIC U.</i>				
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	Personnel not available to relinquish samples from the 3728 Ref# <i>IA</i> on <i>11/19/02</i>				
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

SAMPLE RECEIPT CHECKLIST

15 days

SAMPLE RECEIPT

Client: Bechtel Manjaro Date/Time received 11/20/02 9:55 am

CoC No. B00-056-039

Container I.D. No. ERC 99-11-16 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: 1
7. Number of containers per sample: 1 (Or see CoC _____)
8. Paperwork agrees with samples? Yes No []
9. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels
10. Samples are: In good condition Leaking [] Broken Container [] Missing []
11. Describe any anomalies: _____

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

14. Received by And Banao Date: 11/20/02 Time: 9:55 am

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 _____

Survey Meter Ser. No. _____ Calibration date _____