



EBERLINE SERVICES

RECEIVED APRIL 16, 2010

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

April 16, 2010

0101710

Mr. Michael Neely
CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – B6-06
Richland, WA 99352

Reference: **P.O. #33677**
Eberline Analytical S0-04-005-7813, SDG H4196

Dear Mr. Neely:

Enclosed is a data report for two water samples designated under SAF No. F10-119. The samples were received at Eberline Analytical on April 2, 2010. The samples were analyzed according to the accompanying chain-of-custody documents.

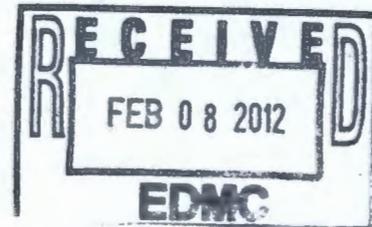
Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Client Services Manager

NJV/jag

Enclosure: Data Package



1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4196 was composed of two water samples designated under SAF No. F10-119 with a Project Designation of: 200-CW-1 Model Group 5 Sampling – Large Area Ponds - QC.

The samples were received as stated on the chain-of-custody documents. Sample B243X5 was received under COC's F10-119-021 and F10-119-022A. Sample B24420 was received under COC's F10-119-042 and F10-119-41A. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

2.4 Neptunium-237 Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. 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."



N. Joseph Verville
Client Services Manager

4/16/10

Date

SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG_H4196

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	12
Report Guides	16
End of Section	30

Prepared by



Reviewed by



Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 04/16/10

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

SDG 7813
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
 Contract No. 33677
 Case no SDG_H4196

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.

Lab id EBRINE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB SAMPLE SUMMARY

SDG 7813
 Contact N. Joseph Verville

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

LAB	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S004005-01	B243X5	216U10Pond;C5766;I-001EB	WATER		F10-119	F10-119-021	04/01/10 06:50
S004005-02	B24420	216-T-4B pond; C6970 EB	WATER		F10-119	F10-119-042	03/31/10 07:10
S004005-03	Lab Control Sample		WATER		F10-119		
S004005-04	Method Blank		WATER		F10-119		
S004005-05	Duplicate (S004005-01)	216U10Pond;C5766;I-001EB	WATER		F10-119		04/01/10 06:50

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-LS
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

QC SUMMARY

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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
7813	F10-119-021	B243X5	WATER		4 L		04/02/10 1		S004005-01	7813-001
	F10-119-042	B24420	WATER		4 L		04/02/10 2		S004005-02	7813-002
		Method Blank	WATER						S004005-04	7813-004
		Lab Control Sample	WATER						S004005-03	7813-003
		Duplicate (S004005-01)	WATER		4 L		04/02/10 1		S004005-05	7813-005

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

PREP BATCH SUMMARY

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALIFIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS	
Alpha Spectroscopy									
NP	WATER	Neptunium in Water	7252-010	14.8	2		1	1	1/1
PU	WATER	Plutonium, Isotopic in Water	7252-010	8.0	2		1	1	1/1
U	WATER	Uranium, Isotopic in Water	7252-010	8.0	2		1	1	1/1
Beta Counting									
SR	WATER	Total Strontium in Water	7252-010	10.4	2		1	1	1/1

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

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB WORK SUMMARY

SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4196

LAB SAMPLE	CLIENT SAMPLE ID	COLLECTED	LOCATION	MATRIX	SUP-	RECEIVED	CUSTODY	SAF No	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
S004005-01	B243X5								7813-001	NP		04/13/10	04/15/10	BW	Neptunium in Water
		04/01/10	216U10Pond;C5766;I-001EB	WATER					7813-001	PU		04/09/10	04/12/10	BW	Plutonium, Isotopic in Water
		04/02/10	F10-119-021				F10-119		7813-001	SR		04/09/10	04/12/10	BW	Total Strontium in Water
									7813-001	U		04/08/10	04/09/10	BW	Uranium, Isotopic in Water
S004005-02	B24420								7813-002	NP		04/13/10	04/15/10	BW	Neptunium in Water
		03/31/10	216-T-4B pond; C6970 EB	WATER					7813-002	PU		04/09/10	04/12/10	BW	Plutonium, Isotopic in Water
		04/02/10	F10-119-042				F10-119		7813-002	SR		04/09/10	04/12/10	BW	Total Strontium in Water
									7813-002	U		04/08/10	04/09/10	BW	Uranium, Isotopic in Water
S004005-03	Lab Control Sample								7813-003	NP		04/13/10	04/15/10	BW	Neptunium in Water
				WATER					7813-003	PU		04/09/10	04/12/10	BW	Plutonium, Isotopic in Water
							F10-119		7813-003	SR		04/09/10	04/12/10	BW	Total Strontium in Water
									7813-003	U		04/08/10	04/09/10	BW	Uranium, Isotopic in Water
S004005-04	Method Blank								7813-004	NP		04/13/10	04/15/10	BW	Neptunium in Water
				WATER					7813-004	PU		04/09/10	04/12/10	BW	Plutonium, Isotopic in Water
							F10-119		7813-004	SR		04/09/10	04/12/10	BW	Total Strontium in Water
									7813-004	U		04/08/10	04/09/10	BW	Uranium, Isotopic in Water
S004005-05	Duplicate (S004005-01)								7813-005	NP		04/13/10	04/15/10	BW	Neptunium in Water
		04/01/10	216U10Pond;C5766;I-001EB	WATER					7813-005	PU		04/09/10	04/12/10	BW	Plutonium, Isotopic in Water
		04/02/10					F10-119		7813-005	SR		04/09/10	04/12/10	BW	Total Strontium in Water
									7813-005	U		04/08/10	04/09/10	BW	Uranium, Isotopic in Water

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
NP	F10-119	Neptunium in Water	NP237_LLE_PLATE_AEA	2			1	1	1		5
PU	F10-119	Plutonium, Isotopic in Water	PUISO_PLATE_AEA	2			1	1	1		5
SR	F10-119	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	2			1	1	1		5
U	F10-119	Uranium, Isotopic in Water	UIISO_PLATE_AEA	2			1	1	1		5
TOTALS				8			4	4	4		20

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 04/16/10

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H4196

7813-004

Method Blank

METHOD BLANK

SDG <u>7813</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4196</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S004005-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7813-004</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>F10-119</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.013	0.46	0.811	2.00	U	SR
Uranium 233/234	U-233/234	0	0.084	0.320	1.00	U	U
Uranium 235	15117-96-1	0.051	0.10	0.387	1.00	U	U
Uranium 238	U-238	0	0.084	0.320	1.00	U	U
Neptunium 237	13994-20-2	0	0.23	0.349	1.00	U	NP
Plutonium 238	13981-16-3	-0.026	0.053	0.201	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.052	0.201	1.00	U	PU

QC-BLANK #72880

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 7

Lab id <u>EBRLNE</u>
Protocol <u>CHPRC</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/16/10</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

7813-003

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7813</u> Contact <u>N. Joseph Verville</u> Lab sample id <u>S004005-03</u> Dept sample id <u>7813-003</u>	Client/Case no <u>CHPRC</u> <u>SDG H4196</u> Contract <u>No. 33677</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>WATER</u> SAF No <u>F10-119</u>
---	--

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS	TEST	pCi/L	pCi/L	%	(TOTAL) LIMITS
Total Strontium	21.5	1.1	0.461	2.00		SR	19.6	0.78	110	80-120 80-120
Uranium 233/234	9.95	1.4	0.719	1.00		U	9.28	0.37	107	73-127 80-120
Uranium 235	7.66	1.2	0.241	1.00		U	7.54	0.30	102	73-127 80-120
Uranium 238	9.64	1.3	0.672	1.00		U	10.1	0.40	95	77-123 80-120
Neptunium 237	26.2	3.7	0.979	1.00		NP	29.8	1.2	88	72-128 80-120
Plutonium 238	11.1	1.4	0.252	1.00		PU	11.5	0.46	97	78-122 80-120
Plutonium 239/240	13.2	1.5	0.202	1.00		PU	13.2	0.53	100	78-122 80-120

QC-LCS #72879

Lab id <u>EBRLNE</u>
Protocol <u>CHPRC</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>04/16/10</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

7813-005

B243X5

DUPLICATE

SDG <u>7813</u> Contact <u>N. Joseph Verville</u> DUPLICATE Lab sample id <u>S004005-05</u> Dept sample id <u>7813-005</u>	ORIGINAL Lab sample id <u>S004005-01</u> Dept sample id <u>7813-001</u> Received <u>04/02/10</u>	Client/Case no <u>CHPRC</u> <u>SDG H4196</u> Contract No. <u>33677</u> Client sample id <u>B243X5</u> Location/Matrix <u>216U10Pond;C5766;I-001EB WATER</u> Collected/Volume <u>04/01/10 06:50</u> <u>4 L</u> Custody/SAF No <u>F10-119-021</u> <u>F10-119</u>
--	---	---

ANALYTE	DUPLICATE		2σ ERR		MDA		RDL		QUALI-		ORIGINAL		2σ ERR		MDA		QUALI-		RPD		3σ DER	
	pCi/L	(COUNT)	pCi/L	(COUNT)	pCi/L	(COUNT)	pCi/L	(COUNT)	FIERS	TEST	pCi/L	(COUNT)	pCi/L	(COUNT)	FIERS	TEST	%	TOT	σ			
Total Strontium	-0.014	0.32	0.647	2.00	U	SR	0.050	0.31	0.632	U	-	0.3										
Uranium 233/234	0.028	0.056	0.212	1.00	U	U	0	0.067	0.255	U	-	0.6										
Uranium 235	0.034	0.067	0.257	1.00	U	U	0	0.081	0.309	U	-	0.6										
Uranium 238	0	0.056	0.212	1.00	U	U	0	0.067	0.255	U	-	0										
Neptunium 237	0	0.19	0.290	1.00	U	NP	0	0.26	0.387	U	-	0										
Plutonium 238	0	0.13	0.302	1.00	U	PU	0	0.11	0.264	U	-	0										
Plutonium 239/240	0.063	0.063	0.241	1.00	U	PU	0.028	0.055	0.211	U	-	0.8										

QC-DUP#1 72881

200-CW-1 Model Group 5 Sampling - Large Area Ponds -QC

Lab id <u>EBRLNE</u>
Protocol <u>CHPRC</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>04/16/10</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H4196

7813-001

B243X5

DATA SHEET

SDG <u>7813</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4196</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S004005-01</u>	Client sample id <u>B243X5</u>	
Dept sample id <u>7813-001</u>	Location/Matrix <u>216U10Pond;C5766;I-001EB WATER</u>	
Received <u>04/02/10</u>	Collected/Volume <u>04/01/10 06:50</u> <u>4 L</u>	
	Custody/SAF No <u>F10-119-021</u> <u>F10-119</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Total Strontium	SR-RAD	0.050	0.31	0.632	2.00	U	SR
Uranium 233/234	U-233/234	0	0.067	0.255	1.00	U	U
Uranium 235	15117-96-1	0	0.081	0.309	1.00	U	U
Uranium 238	U-238	0	0.067	0.255	1.00	U	U
Neptunium 237	13994-20-2	0	0.26	0.387	1.00	U	NP
Plutonium 238	13981-16-3	0	0.11	0.264	1.00	U	PU
Plutonium 239/240	PU-239/240	0.028	0.055	0.211	1.00	U	PU

200-CW-1 Model Group 5 Sampling - Large Area Ponds -QC

Lab id <u>EBRLNE</u>
Protocol <u>CHPRC</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/16/10</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H4196

7813-002

B24420

DATA SHEET

SDG <u>7813</u>	Client/Case no <u>CHPRC</u>	SDG <u>H4196</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>33677</u>	
Lab sample id <u>S004005-02</u>	Client sample id <u>B24420</u>	
Dept sample id <u>7813-002</u>	Location/Matrix <u>216-T-4B pond; C6970 EB WATER</u>	
Received <u>04/02/10</u>	Collected/Volume <u>03/31/10 07:10</u> <u>4 L</u>	
	Custody/SAF No <u>F10-119-042</u> <u>F10-119</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALIFIERS	TEST
Total Strontium	SR-RAD	0.023	0.23	0.478	2.00	U	SR
Uranium 233/234	U-233/234	-0.034	0.068	0.258	1.00	U	U
Uranium 235	15117-96-1	0.041	0.082	0.313	1.00	U	U
Uranium 238	U-238	0	0.068	0.258	1.00	U	U
Neptunium 237	13994-20-2	0	0.29	0.434	1.00	U	NP
Plutonium 238	13981-16-3	0.028	0.11	0.272	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.057	0.217	1.00	U	PU

200-CW-1 Model Group 5 Sampling - Large Area Ponds -QC

DATA SHEETS
 Page 2
 SUMMARY DATA SECTION
 Page 11

Lab id <u>EBRLNE</u>
Protocol <u>CHPRC</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>04/16/10</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB METHOD SUMMARY

NEPTUNIUM IN WATER
ALPHA SPECTROSCOPY

Test NP Matrix WATER
SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Contract SDG H4196

RESULTS

LAB	RAW	SUF-		Neptunium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	237
Preparation batch 7252-010				
S004005-01		7813-001	B243X5	U
S004005-02		7813-002	B24420	U
S004005-03		7813-003	Lab Control Sample	ok
S004005-04		7813-004	Method Blank	U
S004005-05		7813-005	Duplicate (S004005-01)	- U

Nominal values and limits from method RDLs (pCi/L) 1.00

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-	
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED	DETECTOR
Preparation batch 7252-010			2σ prep error 14.8 % Reference Lab Notebook No. 7252 pg.010											
S004005-01		B243X5	0.387	0.200			45		103			12 04/12/10	04/13	SS-036
S004005-02		B24420	0.434	0.200			39		104			13 04/12/10	04/13	SS-037
S004005-03		Lab Control Sample	0.979	0.200			53		104			04/12/10	04/13	SS-038
S004005-04		Method Blank	0.349	0.200			45		108			04/12/10	04/13	SS-051
S004005-05		Duplicate (S004005-01)	0.290	0.200			52		108			12 04/12/10	04/13	SS-052

Nominal values and limits from method 1.00 0.200 30-110 100 180

PROCEDURES REFERENCE NP237_LLE_PLATE_AEA
SPP-062 Sample Aliquoting, rev 1
CP-930 Neptunium from Solids and Water by Extraction
 Chromatography, rev 5
CP-008 Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD MDA 0.488 ± 0.559
FOR 5 SAMPLES YIELD 47 ± 12

METHOD SUMMARIES
Page 1
SUMMARY DATA SECTION
Page 12

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/16/10

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Test PU Matrix WATER
 SDG 7813
 Contact N. Joseph Verville

Client CHPRC
 Contract No. 33677
 Contract SDG H4196

RESULTS

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

Preparation batch 7252-010

S004005-01	7813-001	B243X5		U	U
S004005-02	7813-002	B24420		U	U
S004005-03	7813-003	Lab Control Sample		ok	ok
S004005-04	7813-004	Method Blank		U	U
S004005-05	7813-005	Duplicate (S004005-01)		- U	- U

Nominal values and limits from method RDLs (pCi/L) 1.00 1.00

METHOD PERFORMANCE

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

Preparation batch 7252-010 2σ prep error 8.0 % Reference Lab Notebook No. 7252 pg.010

S004005-01		B243X5		0.264	0.500			76		113			8	04/09/10	04/09	SS-061
S004005-02		B24420		0.272	0.500			73		113			9	04/09/10	04/09	SS-062
S004005-03		Lab Control Sample		0.252	0.500			78		113				04/09/10	04/09	SS-063
S004005-04		Method Blank		0.201	0.500			82		113				04/09/10	04/09	SS-064
S004005-05		Duplicate (S004005-01)		0.302	0.500			64		113			8	04/09/10	04/09	SS-065

Nominal values and limits from method 1.00 0.500 30-110 100 100 180

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	SPP-040	Environmental Water Dissolution, rev 2
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA	<u>0.258</u> ± <u>0.074</u>
FOR 5 SAMPLES	YIELD	<u>75</u> ± <u>14</u>

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

Page 13

Lab id	<u>EBRLNE</u>
Protocol	<u>CHPRC</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-LMS</u>
Version	<u>3.06</u>
Report date	<u>04/16/10</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Test U Matrix WATER
 SDG 7813
 Contact N. Joseph Verville

Client CHPRC
 Contract No. 33677
 Contract SDG H4196

RESULTS

LAB SAMPLE ID	RAW TEST FIX	SUP- PLANCHET	CLIENT SAMPLE ID	1: Uranium		2: Uranium		3: Uranium		RESULT RATIOS (%)				
				233/234		235		238		1+3	2a	2+3	2a	
Preparation batch 7252-010														
S004005-01		7813-001	B243X5		U		U		U					
S004005-02		7813-002	B24420		U		U		U					
S004005-03		7813-003	Lab Control Sample		ok		ok		ok					
S004005-04		7813-004	Method Blank		U		U		U					
S004005-05		7813-005	Duplicate (S004005-01)		- U		- U		- U					
Nominal values and limits from method				RDLs (pCi/L)	1.00		1.00		1.00			100	4	
													Averages	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST FIX	SUP- CLIENT SAMPLE ID	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-		
													PREPARED	YZED	DETECTOR
Preparation batch 7252-010													2a	prep error 8.0 %	Reference Lab Notebook No. 7252 pg.010
S004005-01		B243X5	0.309	0.500			81		106			7	04/08/10	04/08	SS-031
S004005-02		B24420	0.313	0.500			77		106			8	04/08/10	04/08	SS-032
S004005-03		Lab Control Sample	0.719	0.500			92		106				04/08/10	04/08	SS-033
S004005-04		Method Blank	0.387	0.500			65		106				04/08/10	04/08	SS-034
S004005-05		Duplicate (S004005-01)	0.257	0.500			76		106			7	04/08/10	04/08	SS-036
Nominal values and limits from method			1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	UIISO_PLATE_AEA
	SPP-062	Sample Aliquoting, rev 1
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA <u>0.397 ± 0.372</u>
FOR 5 SAMPLES	YIELD <u>78 ± 19</u>

Lab id	<u>EBRLNE</u>
Protocol	<u>CHPRC</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-LMS</u>
Version	<u>3.06</u>
Report date	<u>04/16/10</u>

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 14

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H4196

LAB METHOD SUMMARY

TOTAL STRONTIUM IN WATER
BETA COUNTING

Test SR Matrix WATER
SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Contract SDG H4196

RESULTS

LAB	RAW	SUF-		Total
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Strontium
Preparation batch 7252-010				
S004005-01		7813-001	B243X5	U
S004005-02		7813-002	B24420	U
S004005-03		7813-003	Lab Control Sample	ok
S004005-04		7813-004	Method Blank	U
S004005-05		7813-005	Duplicate (S004005-01)	- U

Nominal values and limits from method RDLs (pCi/L) 2.00

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7252-010			2σ prep error 10.4 %			Reference Lab Notebook No. 7252 pg.010									
S004005-01		B243X5	0.632	0.500			92		100			8	04/09/10	04/09	GRB-202
S004005-02		B24420	0.478	0.500			92		100			9	04/09/10	04/09	GRB-217
S004005-03		Lab Control Sample	0.461	0.500			92		100				04/09/10	04/09	GRB-220
S004005-04		Method Blank	0.811	0.500			91		100				04/09/10	04/09	GRB-226
S004005-05		Duplicate (S004005-01)	0.647	0.500			89		100			8	04/09/10	04/09	GRB-227

Nominal values and limits from method 2.00 0.500 40-110 100 180

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
SPP-062 Sample Aliquoting, rev 1
CP-380 Strontium in Water Samples, rev 5

AVERAGES ± 2 SD MDA 0.606 ± 0.286
FOR 5 SAMPLES YIELD 91 ± 3

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 04/16/10

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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 CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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 EBRINE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

GUIDE, cont.

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 CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG H4196

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.

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 21

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG H4196

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 24

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4196

REPORT GUIDE

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 CHPRC
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4196

GUIDE, cont.

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.

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/16/10

SDG 7813
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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'

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

GUIDE, cont.

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H4196

SDG 7813
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
 Contract No. 33677
 Case no SDG H4196

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.

Lab id EBRLNE
 Protocol CHPRC
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/16/10

COLLECTOR KB Hulse	COMPANY CONTACT BAMBERGER, MA H4196	TELEPHONE NO. 373-0880 (7813)	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 7C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 216-U-10 Pond; C5766; I-001 EB	PROJECT DESIGNATION 200-CW-1 Model Group 5 Sampling - Large Area Ponds - QC		SAF NO. F10-119	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. 6WS-090	FIELD LOGBOOK NO. HNF-N-507-5	ACTUAL SAMPLE DEPTH N/A	COA 302427ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	

SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. SEE PTR	BILL OF LADING/AIR BILL NO. SEE PTR 2004/1/10 793409946869
--	--	--

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	HNO3 to pH <2	2004-1-10 793409946869
		TYPE OF CONTAINER	G/P	
		NO. OF CONTAINER(S)	1	
		VOLUME	1000mL	
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS	Neptunium-237;	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B243X5	WATER	4-1-10	0650	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM KB Hulse	DATE/TIME APR 07 2010 1030	RECEIVED BY/STORED IN L.D. Wall	DATE/TIME APR 07 2010 1030	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.	
RELINQUISHED BY/REMOVED FROM L.D. Wall	DATE/TIME APR 07 2010 1430	RECEIVED BY/STORED IN FEDEX	DATE/TIME		
RELINQUISHED BY/REMOVED FROM S Fed	DATE/TIME 04/02/10 9:30	RECEIVED BY/STORED IN Cantieri	DATE/TIME 04/02/10 10:00		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

 ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

COLLECTOR Hulse		COMPANY CONTACT BAMBERGER, MA H4196		TELEPHONE NO. 373-0880 (7813)	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 7C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 216-U-10 Pond; C5766; I-001 EB		PROJECT DESIGNATION 200-CW-1 Model Group 5 Sampling - Large Area Ponds - QC			SAF NO. F10-119	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GWS-090		FIELD LOGBOOK NO. HNF-N-507-5	ACTUAL SAMPLE DEPTH N/A		COA 302427E510	METHOD OF SHIPMENT GOVERNMENT VEHICLE	

SHIPPED TO Waste Sampling & Characterization Eberline Services L.W. 4/1/10		OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A L.W. 4/1/10 793409946869				
---	--	------------------------------------	--	--	--	--	--

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HNO3 to pH	NaOH to pH	HNO3 to pH	HNO3 to pH	HNO3 to pH	HNO3 to pH	HCl to pH <2	
			<2	>=12	<2	<2	<2	<2	<2	
A=Air DL=Drum L=Liquid DS=Drum S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	TYPE OF CONTAINER	G/P	P	P	G/P	P	G/P	G/P	
		NO. OF CONTAINER(S)	1	1	1	1	1	1	2	
		VOLUME	500mL	500mL	250mL	500mL	1000mL	1000mL	1L	
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Cyanide (Total) SM45D0;	Gamma Spectroscopy (Cesium-137, Europium-154)	Isotopic Plutonium (Plutonium-239/240)	Isotopic Uranium (Uranium-238)	Strontium-89,90 -- Total Sr;	Technetium-99;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B243X5	WATER	4-1-10	0650				X	X	X
782 4-1-10									

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	** The CACN for WSCF Analytical is currently being determined. Once the CACN is established it will be distributed for use by the laboratory. <input type="checkbox"/> <input type="checkbox"/> ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. (1) ICP Metals - 6010 (TAL) {Sodium, Iron, Potassium, Calcium, Magnesium} ICP Metals - 6010 (Add-On) {Boron, Bismuth, Titanium, Lithium} ICP/MS - 200.8 (TAL) {Aluminum, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Zinc, Manganese, Nickel, Vanadium, Silver}. ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Molybdenum, Strontium, Thallium, Beryllium, Uranium, Selenium} 200.8_HG - ICPMS {Mercury} (2) IC Anions - 300.0 {Phosphorus in phosphate, Chloride, Nitrogen in Nitrite, Fluoride, Nitrogen in Nitrate, Sulfate}	
KB Hulse / KB Hulse	APR 07 2010 1020	L.D. Wall / L.D. Wall	APR 07 2010 1030		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
L.D. Wall / L.D. Wall	APR 01 2010 1430	FEDEX			
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
SP Fed Ex	04/02/10 9:30	SP Hui	04/02/10 10:00		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		

 ORIGINAL
Samples AEA + SE-90 transferred from Original 782 4-1-10

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

COLLECTOR Scates	COMPANY CONTACT BAMBERGER, MA H4196	TELEPHONE NO. 373-0880 (7813)	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 7C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 216-T-4B pond; C6970 EB	PROJECT DESIGNATION 200-CW-1 Model Group 5 Sampling - Large Area Ponds - QC		SAF NO. F10-119	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GWS-090	FIELD LOGBOOK NO. HNF-N 501-5	ACTUAL SAMPLE DEPTH N/A	COA 302427ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	

SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. SEE PTR	BILL OF LADING/AIR BILL NO. SEE PTR 2/24/10 7934 09946869
--	--	---

MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION HNO3 to pH <2	JS 3/31/10
		TYPE OF CONTAINER G/P	
		NO. OF CONTAINER(S) 1	
		VOLUME 1000mL	
SPECIAL HANDLING AND/OR STORAGE		SAMPLE ANALYSIS Neptunium-237;	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B24420	WATER	3/31/10	0710	X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES
RELINQUISHED BY/REMOVED FROM J Scates	RECEIVED BY/STORED IN SSU-1
DATE/TIME 3/31/10 1200	DATE/TIME 3/31/10 1200
RELINQUISHED BY/REMOVED FROM SSU-1	RECEIVED BY/STORED IN LD. Wall
DATE/TIME APR 07 2010 1030	DATE/TIME APR 07 2010 1030
RELINQUISHED BY/REMOVED FROM LD. Wall	RECEIVED BY/STORED IN FEDEX
DATE/TIME APR 07 2010 1430	DATE/TIME
RELINQUISHED BY/REMOVED FROM Fed Ex	RECEIVED BY/STORED IN Smith
DATE/TIME 04/02/10 9:30	DATE/TIME 4/02/10 10:00
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN
DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN
DATE/TIME	DATE/TIME

SPECIAL INSTRUCTIONS
 ** The CACN for WSCF Analytical is currently being determined. Once the CACN is established it will be distributed for use by the laboratory. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.

 ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

COLLECTOR: *Scales*
 COMPANY CONTACT: BAMBERGER, MA *H4196*
 TELEPHONE NO.: 373-0880 *(7813)*
 PROJECT COORDINATOR: WIDRIG, DL
 PRICE CODE: 7C
 DATA TURNAROUND: 15 Days / 15 Days
 SAMPLING LOCATION: 216-T-4B pond; C6970 EB
 PROJECT DESIGNATION: 200-CW-1 Model Group 5 Sampling - Large Area Ponds - QC
 SAF NO.: F10-119
 AIR QUALITY:

ICE CHEST NO.: *20.4/110* *W/A* *6WS-090*
 FIELD LOGBOOK NO.: *HWF-W-507-5*
 ACTUAL SAMPLE DEPTH: *N/A*
 COA: 302427ES10
 METHOD OF SHIPMENT: GOVERNMENT VEHICLE
 SHIPPED TO: Waste Sampling & Characterization *Eberline Services*
 OFFSITE PROPERTY NO.: *N/A*
 BILL OF LADING/AIR BILL NO.: *20.4/110* *793409946869*

MATRIX* A=Air DL=Drum L=Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)	PRESERVATION	HNO3 to pH <2	Cool ~4C	NaOH to pH =12	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	
		TYPE OF CONTAINER	G/P	P	P	G/P	P	G/P	G/P	G/P	
		NO. OF CONTAINER(S)	1 <i>W. 4/1/10</i>	1 <i>W. 4/1/10</i>	1 <i>W. 4/1/10</i>	1 <i>W. 4/1/10</i>	1	1	1	2 <i>W. 4/1/10</i>	1 <i>W. 3/31/10</i>
		VOLUME	500mL	500mL	250mL	500mL	1000mL	1000mL	1L	1L	1L
SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Cyanide (Total) - SM4500;	Gamma Spectroscopy (Cesium-137, Europium-154)	Isotopic Plutonium (Plutonium-239/240)	Isotopic Uranium (Uranium-238)	Strontium-89,90 -- Total Sr;	Technetium-99;		

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	HNO3 to pH <2	Cool ~4C	NaOH to pH =12	HNO3 to pH <2	HCl to pH <2			
B24420	WATER	<i>3/31/10</i>	<i>0710</i>	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM <i>J Scales</i>	DATE/TIME <i>3/31/10 12:00</i>	RECEIVED BY/STORED IN SSU- 1
RELINQUISHED BY/REMOVED FROM SSU- 1	DATE/TIME <i>APR 07 2010 10:30</i>	RECEIVED BY/STORED IN <i>L.D. Wall</i>
RELINQUISHED BY/REMOVED FROM <i>CH2M Hill</i>	DATE/TIME <i>APR 07 2010 14:30</i>	RECEIVED BY/STORED IN FEDEX
RELINQUISHED BY/REMOVED FROM <i>Fed Ex</i>	DATE/TIME <i>4/02/10 9:30</i>	RECEIVED BY/STORED IN <i>Santon</i>
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN

**** The CACN for WSCF Analytical is currently being determined. Once the CACN is established it will be distributed for use by the laboratory. ☐☐** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.**

(1) ICP Metals - 6010 (TAL) {Sodium, Iron, Potassium, Calcium, Magnesium} ICP Metals - 6010 (Add-On) {Boron, Bismuth, Titanium, Lithium} ICP/MS - 200.8 (TAL) {Aluminum, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Zinc, Manganese, Nickel, Vanadium, Silver} ICP/MS - 200.8 (Add-on) {Arsenic, Lead, Molybdenum, Strontium, Thallium, Beryllium, Uranium, Selenium} 200.8_HG - ICPMS {Mercury}

(2) IC Anions - 300.0 {Phosphorus in phosphate, Chloride, Nitrogen in Nitrate, Fluoride, Nitrogen in Nitrate, Sulfate} *Redirecting samples to Eberline per WSCF lab. L.D. Wall 4/1/10*

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: CHPRC City Richland State WA

Date/Time received 04/02/10 9:30 CoC No. F10-119-021, F10-119-022, F10-119-041, F10-119-040

Container I.D. No. BWS-090 Requested TAT (Days) 15 day 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: 2 Sample Matrix water
7. Number of containers per sample: 4 (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 2 Preservative _____
13. Describe any anomalies: _____

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

15. Inspected by Con Hon Date: 04/02/10 Time: 10:00

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
<u>all Sample</u>	<u>260</u>						

Ion Chamber Ser. No. _____

Calibration date _____

Alpha Meter Ser. No. _____

Calibration date _____

Beta/Gamma Meter Ser. No. 100482

Calibration date 04/02/10