EBERLINE SERVICES

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December 30, 2010

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 S0-12-302-7767, SDG H4474

Dear Mr. Neely:

Enclosed is a data report for three water samples designated under SAF No. F11-040 received at Eberline Analytical on December 22, 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/ljb

Enclosure: Case Narrative

1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4474 was composed of three water samples designated under SAF No. F11-040 with a Project Designation of: 600-287 –PL – QC Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analysis. The requested analysis was TRITIUM_MIDLEVEL, which requires a detection limit of 30 pCi/L. Eberline Analytical cannot achieve a required detection limit of 30 pCi/L therefore, after consulting with CHPRC, it was agreed that Eberline would do the "best" it could within the required turn-around-time. The achieved detection limits for the field samples were 145 pCi/L, 147 pCi/L, and 149 pCi/L respectively; tritium activity was not detected in the field samples that was greater than the individual sample specific MDA. The tritium QC Matrix Spike analysis data sheet denotes an "X" qualifier, which indicates that some data was manually entered and may need to be double-checked; in this case the "added amount" was manually entered and subsequently double-checked. The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD, or statistical control limit is calculated.

2.2 Nickel-63 Analysis

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

2.3 Strontium-90 Analysis

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

2.4 Technetium-99 Analysis

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

2.5 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses. 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.

2.6 Isotopic Uranium Analysis

The U-235 QC LCS recovery was 129%, greater than the upper control limit of 120%. Isotopic uranium activities were not observed in the samples that was greater than the individual sample specific MDA's. See the attached Issue Resolution Form. 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. For some analytical results the gross counts minus the sum of the background counts and the counts contributed from the tracer were 0; therefore the results reported as 0 are correct. No other problems were encountered during the course of the analyses.

2.7 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses. 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. For some analytical results the gross counts minus the sum of the background counts and the counts contributed from the tracer were 0; therefore the results reported as 0 are correct.

2.8 Americium-241 Analysis

No problems were encountered during the course of the analyses. The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD or statistical control limit is calculated. For some analytical results the gross counts minus the sum of the background counts and the counts contributed from the tracer were 0; therefore the results reported as 0 are correct.

2.9 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

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

N. Joseph Verville
Client Services Manager

12/30/10
Date

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-295

Date : **December 30, 2010** SAF No. **F11-040**

SDG: **H4474** LOGIN No.: TEST: **TRITIUM_MIDLEVEL**

Sample No.(s) **B2B4X1, B2B4X3, B2B4X4**

Submitted By: J. Verville, EAC
Phone No. 510-235-2633 x264
Fax No. 510-235-0438

Submitted To: Sara Champoux
Phone No. 509-373-5290
Fax No.

ISSUE	PROPOSED RESOLUTION
TRITIUM_MIDLEVEL requires a detection limit of 30 pCi/L which is an RDL that Eberline cannot achieve through installed procedures.	Eberline will make a best effort to achieve a detection limit that will be between 80-150 pCi/L given the expedited turn-around requested for the SDG.

CHPRC/BHI/WMH/PNNL COMMENTS

Accept proposed resolution and note actual detection limit achieved versus requested detection limit of 30 pCi/L in case narrative.

J. G. Douglas 12/30/2010
Signature and Date

ISSUE RESOLUTION FORM

CHPRC TRACKING NUMBER: 10-296

Date: December 30, 2010 SAF No. F11-040

SDG: H4474 LOGIN No.: TEST: Isotopic Uranium

Sample No.(s) **B2B4X1, B2B4X3**

Submitted By: J. Verville, EAC	Submitted To: Sara Champoux
Phone No. 510-235-2633 x264	Phone No. 509-373-5290
Fax No. 510-235-0438	Fax No.

ISSUE	PROPOSED RESOLUTION
The QC LCS recovery for U-235 was 129%, greater than the upper control limit of 120%. All sample results were non-detect and all MDA's were less than the RDL.	Due to the expedited TAT report the results "as are". A reanalysis has been initiated, the result for which will be reported ASAP.

CHPRC/BHI/WMH/PNNL COMMENTS

Accept proposed resolution and note LCS recovery failure in case narrative.

J. G. Douglas 12/30/2010
Signature and Date

E B E R L I N E A N A L Y T I C A L / R I C H M O N D
SAMPLE DELIVERY GROUP H4474

SDG	7767
Contact	N. Joseph Verville

Client	CHPRC
Contract	No. 33677
Case no	SDG_H4474

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

VB
Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	12/30/10

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG_H4474

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 12/30/10

SDG 7767
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG_H4474

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.

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

LAB SAMPLE SUMMARY

SDG 7767
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4474

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S012302-01	B2B4X1	600-287-PL EB (Day 1)	WATER		F11-040	F11-040-008	12/19/10 07:05
S012302-02	B2B4X3	600-287-PL FB 1	WATER		F11-040	F11-040-010	12/19/10 10:30
S012302-03	B2B4X4	600-287-PL TB1	WATER		F11-040	F11-040-011	12/19/10 07:30
S012302-04	Lab Control Sample		WATER		F11-040		
S012302-05	Method Blank		WATER		F11-040		
S012302-06	Duplicate (S012302-01)	600-287-PL EB (Day 1)	WATER		F11-040		12/19/10 07:05
S012302-07	Spike (S012302-02)	600-287-PL FB 1	WATER		F11-040		12/19/10 10:30

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SDG 7767
Contact N. Joseph Verville

SAMPLE DELIVERY GROUP H4474

QC SUMMARY

Client CHPRC
Contract No. 33677
Case no SDG H4474

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS RECEIVED	SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7767	F11-040-008	B2B4X1	WATER		10.0 L		12/22/10	3	S012302-01	7767-001
	F11-040-010	B2B4X3	WATER		10.0 L		12/22/10	3	S012302-02	7767-002
	F11-040-011	B2B4X4	WATER		0.125 L		12/22/10	3	S012302-03	7767-003
		Method Blank	WATER						S012302-05	7767-005
		Lab Control Sample	WATER						S012302-04	7767-004
		Duplicate (S012302-01)	WATER		10.0 L		12/22/10	3	S012302-06	7767-006
		Spike (S012302-02)	WATER		10.0 L		12/22/10	3	S012302-07	7767-007

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

SDG 7767
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client CHPRC
Contract No. 33677
Case no SDG H4474

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	WATER	Americium 241 in Water	7287-006	8.0	2			1	1	1/1		
PU	WATER	Plutonium, Isotopic in Water	7287-006	8.0	2			1	1	1/1		
TH	WATER	Thorium, Isotopic in Water	7287-006	8.0	2			1	1	1/1		
U	WATER	Uranium, Isotopic in Water	7287-006	8.0	2			1	1	1/1		
Beta Counting												
SR	WATER	Total Strontium in Water	7287-006	10.4	2			1	1	1/1		
TC	WATER	Technetium 99 in Water	7287-006	13.2	2			1	1	1/1		
Gamma Spectroscopy												
GAM	WATER	Gamma Emitters	7287-006	7.0	2			1	1	1/1		
Liquid Scintillation Counting												
H	WATER	Tritium in Water	7287-006	10.0	3			1	1	1/1	1/1	X
NI_L	WATER	Nickel-63 in Liquid	7287-006	11.2	2			1	1	1/1		

Blank, LCS, Duplicate and Spike planchets are those in the same preparation batch as some Client sample.

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

LAB WORK SUMMARY

SDG 7767
Contact N. Joseph Verville

Client CHPRC
Contract No. 33677
Case no SDG H4474

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S012302-01	B2B4X1			7767-001	AM		12/28/10	12/30/10	MWT	Americium 241 in Water
12/19/10	600-287-PL EB (Day 1)		WATER	7767-001	GAM		12/22/10	12/27/10	MWT	Gamma Emitters
12/22/10	F11-040-008	F11-040		7767-001	H		12/23/10	12/28/10	MWT	Tritium in Water
				7767-001	NI_L		12/29/10	12/30/10	MWT	Nickel-63 in Liquid
				7767-001	PU		12/28/10	12/30/10	MWT	Plutonium, Isotopic in Water
				7767-001	SR		12/27/10	12/29/10	MWT	Total Strontium in Water
				7767-001	TC		12/28/10	12/29/10	MWT	Technetium 99 in Water
				7767-001	TH		12/29/10	12/30/10	MWT	Thorium, Isotopic in Water
				7767-001	U		12/28/10	12/29/10	MWT	Uranium, Isotopic in Water
S012302-02	B2B4X3			7767-002	AM		12/28/10	12/30/10	MWT	Americium 241 in Water
12/19/10	600-287-PL FB 1		WATER	7767-002	GAM		12/22/10	12/27/10	MWT	Gamma Emitters
12/22/10	F11-040-010	F11-040		7767-002	H		12/23/10	12/28/10	MWT	Tritium in Water
				7767-002	NI_L		12/29/10	12/30/10	MWT	Nickel-63 in Liquid
				7767-002	PU		12/28/10	12/30/10	MWT	Plutonium, Isotopic in Water
				7767-002	SR		12/27/10	12/29/10	MWT	Total Strontium in Water
				7767-002	TC		12/28/10	12/29/10	MWT	Technetium 99 in Water
				7767-002	TH		12/29/10	12/30/10	MWT	Thorium, Isotopic in Water
				7767-002	U		12/28/10	12/29/10	MWT	Uranium, Isotopic in Water
S012302-03	B2B4X4			7767-003	H		12/23/10	12/28/10	MWT	Tritium in Water
12/19/10	600-287-PL TB1		WATER							
12/22/10	F11-040-011	F11-040								
S012302-04	Lab Control Sample			7767-004	AM		12/29/10	12/30/10	MWT	Americium 241 in Water
			WATER	7767-004	GAM		12/22/10	12/27/10	MWT	Gamma Emitters
		F11-040		7767-004	H		12/23/10	12/28/10	MWT	Tritium in Water
				7767-004	NI_L		12/29/10	12/30/10	MWT	Nickel-63 in Liquid
				7767-004	PU		12/28/10	12/30/10	MWT	Plutonium, Isotopic in Water
				7767-004	SR		12/27/10	12/29/10	MWT	Total Strontium in Water
				7767-004	TC		12/27/10	12/29/10	MWT	Technetium 99 in Water
				7767-004	TH		12/29/10	12/30/10	MWT	Thorium, Isotopic in Water
				7767-004	U		12/28/10	12/29/10	MWT	Uranium, Isotopic in Water

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

SDG 7767
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client CHPRC
Contract No. 33677
Case no SDG H4474

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S012302-05	Method Blank			7767-005	AM		12/29/10	12/30/10	MWT	Americium 241 in Water
			WATER	7767-005	GAM		12/22/10	12/27/10	MWT	Gamma Emitters
		F11-040		7767-005	H		12/23/10	12/28/10	MWT	Tritium in Water
				7767-005	NI_L		12/29/10	12/30/10	MWT	Nickel-63 in Liquid
				7767-005	PU		12/29/10	12/30/10	MWT	Plutonium, Isotopic in Water
				7767-005	SR		12/27/10	12/29/10	MWT	Total Strontium in Water
				7767-005	TC		12/28/10	12/29/10	MWT	Technetium 99 in Water
				7767-005	TH		12/29/10	12/30/10	MWT	Thorium, Isotopic in Water
				7767-005	U		12/28/10	12/29/10	MWT	Uranium, Isotopic in Water
S012302-06	Duplicate (S012302-01)			7767-006	AM		12/28/10	12/30/10	MWT	Americium 241 in Water
12/19/10	600-287-PL EB (Day 1)		WATER	7767-006	GAM		12/22/10	12/27/10	MWT	Gamma Emitters
12/22/10		F11-040		7767-006	H		12/23/10	12/28/10	MWT	Tritium in Water
				7767-006	NI_L		12/29/10	12/30/10	MWT	Nickel-63 in Liquid
				7767-006	PU		12/29/10	12/30/10	MWT	Plutonium, Isotopic in Water
				7767-006	SR		12/27/10	12/29/10	MWT	Total Strontium in Water
				7767-006	TC		12/28/10	12/29/10	MWT	Technetium 99 in Water
				7767-006	TH		12/29/10	12/30/10	MWT	Thorium, Isotopic in Water
				7767-006	U		12/28/10	12/29/10	MWT	Uranium, Isotopic in Water
S012302-07	Spike (S012302-02)			7767-007	H		12/23/10	12/28/10	MWT	Tritium in Water
12/19/10	600-287-PL FB 1		WATER							
12/22/10		F11-040								

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 12/30/10

SDG 7767
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client CHPRC
Contract No. 33677
Case no SDG H4474

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	F11-040	Americium 241 in Water	AMCMISO_IE_PLATE_AEA	2			1	1	1		5
GAM	F11-040	Gamma Emitters	GAMMA_GS	2			1	1	1		5
H	F11-040	Tritium in Water	906.0_H3_LSC	3			1	1	1	1	7
NI_L	F11-040	Nickel-63 in Liquid	NI63_LSC	2			1	1	1		5
PU	F11-040	Plutonium, Isotopic in Water	PUISO_PLATE_AEA	2			1	1	1		5
SR	F11-040	Total Strontium in Water	SRTOT_SEP_PRECIP_GPC	2			1	1	1		5
TC	F11-040	Technetium 99 in Water	TC99_TR_SEP_GPC	2			1	1	1		5
TH	F11-040	Thorium, Isotopic in Water	THISO_IE_PLATE_AEA	2			1	1	1		5
U	F11-040	Uranium, Isotopic in Water	UISO_PLATE_AEA	2			1	1	1		5
TOTALS				19			9	9	9	1	47

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-005 Method Blank

METHOD BLANK

SDG 7767 Client/Case no CHPRC SDG H4474
Contact N. Joseph Verville Contract No. 33677

Lab sample id S012302-05 Client sample id Method Blank
Dept sample id 7767-005 Material/Matrix WATER
SAF No F11-040

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	-21.1	86	147	30.0	U	H
Nickel 63	13981-37-8	-1.33	1.7	2.94	15.0	U	NI_L
Total Strontium	SR-RAD	-0.257	0.42	0.818	2.00	U	SR
Technetium 99	14133-76-7	-0.824	1.3	2.84	15.0	U	TC
Thorium 228	14274-82-9	0.060	0.12	0.221		U	TH
Thorium 230	14269-63-7	-0.060	0.16	0.368	1.00	U	TH
Thorium 232	TH-232	0	0.040	0.153	1.00	U	TH
Uranium 233/234	U-233/234	0.027	0.11	0.206	1.00	U	U
Uranium 235	15117-96-1	0	0.065	0.250	1.00	U	U
Uranium 238	U-238	0	0.054	0.206	1.00	U	U
Americium 241	14596-10-2	0.151	0.18	0.289	1.00	U	AM
Plutonium 238	13981-16-3	0.043	0.17	0.410	1.00	U	PU
Plutonium 239/240	PU-239/240	0.043	0.086	0.328	1.00	U	PU
Tin 126	15832-50-5	U		14.2		U	GAM
Beryllium 7	13966-02-4	U		61.4		U	GAM
Potassium 40	13966-00-2	U		124		U	GAM
Cobalt 60	10198-40-0	U		10.3	25.0	U	GAM
Ruthenium 106	13967-48-1	U		74.2		U	GAM
Antimony 125	14234-35-6	U		17.0		U	GAM
Cesium 134	13967-70-9	U		10.9		U	GAM
Cesium 137	10045-97-3	U		7.92	15.0	U	GAM
Europium 152	14683-23-9	U		21.2	50.0	U	GAM
Europium 154	15585-10-1	U		23.3	50.0	U	GAM
Europium 155	14391-16-3	U		18.1	50.0	U	GAM
Niobium 94	14681-63-1	U		7.22		U	GAM
Radium 226	13982-63-3	U		16.3		U	GAM
Radium 228	15262-20-1	U		36.2		U	GAM

7767-005 Method Blank

BLANK, cont.

SDG	7767	Client/Case no	CHPRC SDG H4474
Contact	N. Joseph Verville	Contract	No. 33677
Lab sample id	S012302-05	Client sample id	Method Blank
Dept sample id	7767-005	Material/Matrix	WATER
		SAF No	F11-040

QC-BLANK #76587

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-004 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7767 Client/Case no CHPRC SDG H4474

Contact N. Joseph Verville Contract No. 33677

Lab sample id S012302-04 Client sample id Lab Control Sample

Dept sample id 7767-004 Material/Matrix WATER

SAF No F11-040

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	2480	140	149	30.0		H	2550	100	97	82-118	80-120
Nickel 63	200	5.8	2.95	15.0		NI_L	216	8.6	93	83-117	80-120
Total Strontium	18.7	1.0	0.513	2.00		SR	17.5	0.70	107	80-120	80-120
Technetium 99	1190	21	3.90	15.0		TC	1090	44	109	77-123	80-120
Thorium 230	8.46	1.1	0.354	1.00		TH	9.44	0.38	90	79-121	80-120
Uranium 233/234	10.1	1.4	0.805	1.00		U	9.28	0.37	109	73-127	80-120
Uranium 235	9.71	1.4	0.251	1.00		U	7.54	0.30	129	68-132	80-120
Uranium 238	10.8	1.5	0.771	1.00		U	10.1	0.40	107	74-126	80-120
Americium 241	11.5	1.6	0.410	1.00		AM	10.1	0.40	114	72-128	80-120
Plutonium 238	10.9	1.7	0.402	1.00		PU	11.5	0.46	95	74-126	80-120
Plutonium 239/240	12.7	1.9	0.321	1.00		PU	13.2	0.53	96	75-125	80-120
Cobalt 60	422	23	11.0	25.0		GAM	412	16	102	85-115	80-120
Cesium 137	469	21	14.0	15.0		GAM	442	18	106	85-115	80-120

QC-LCS #76586

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-006 B2B4X1

DUPLICATE

SDG 7767 Client/Case no CHPRC SDG H4474

Contact N. Joseph Verville Contract No. 33677

DUPLICATE	ORIGINAL	
Lab sample id S012302-06	Lab sample id S012302-01	Client sample id B2B4X1
Dept sample id 7767-006	Dept sample id 7767-001	Location/Matrix 600-287-PL EB (Day 1) WATER
	Received 12/22/10	Collected/Volume 12/19/10 07:05 10.0 L
		Custody/SAF No F11-040-008 F11-040

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	108	90	147	30.0	U	H	20.8	86	145	U	-		1.4
Nickel 63	-0.744	1.7	2.88	15.0	U	NI_L	-0.668	1.7	2.88	U	-		0.1
Total Strontium	0.020	0.39	0.758	2.00	U	SR	-0.046	0.35	0.711	U	-		0.3
Technetium 99	-0.707	1.9	4.31	15.0	U	TC	-0.409	1.4	3.87	U	-		0.3
Thorium 228	0	0.083	0.198		U	TH	0.018	0.11	0.202	U	-		0.3
Thorium 230	-0.104	0.17	0.366	1.00	U	TH	-0.146	0.15	0.348	U	-		0.4
Thorium 232	0	0.041	0.158	1.00	U	TH	0.018	0.036	0.139	U	-		0.7
Uranium 233/234	0	0.048	0.185	1.00	U	U	0	0.061	0.234	U	-		0
Uranium 235	0	0.059	0.224	1.00	U	U	0	0.074	0.283	U	-		0
Uranium 238	0	0.048	0.185	1.00	U	U	0	0.061	0.234	U	-		0
Americium 241	0.029	0.12	0.320	1.00	U	AM	0	0.13	0.366	U	-		0.3
Plutonium 238	0.026	0.11	0.201	1.00	U	PU	-0.042	0.084	0.322	U	-		1.0
Plutonium 239/240	0.026	0.053	0.201	1.00	U	PU	0	0.084	0.322	U	-		0.5
Tin 126	U		11.1		U	GAM	U		15.0	U	-		0.4
Beryllium 7	U		40.1		U	GAM	U		56.1	U	-		0.5
Potassium 40	U		69.4		U	GAM	U		91.1	U	-		0.4
Cobalt 60	U		4.88	25.0	U	GAM	U		7.65	U	-		0.6
Ruthenium 106	U		47.4		U	GAM	U		59.6	U	-		0.3
Antimony 125	U		13.4		U	GAM	U		17.8	U	-		0.4
Cesium 134	U		7.18		U	GAM	U		8.75	U	-		0.3
Cesium 137	U		5.09	15.0	U	GAM	U		6.67	U	-		0.4
Europium 152	U		14.4	50.0	U	GAM	U		20.1	U	-		0.5
Europium 154	U		15.1	50.0	U	GAM	U		19.8	U	-		0.4
Europium 155	U		17.1	50.0	U	GAM	U		21.8	U	-		0.3
Niobium 94	U		4.85		U	GAM	U		6.54	U	-		0.4
Radium 226	U		12.0		U	GAM	U		17.1	U	-		0.5
Radium 228	U		23.8		U	GAM	U		31.8	U	-		0.4

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

DUPLICATE, cont.

SDG	7767			Client/Case no	CHPRC SDG H4474
Contact	N. Joseph Verville			Contract	No. 33677
	DUPLICATE		ORIGINAL		
Lab sample id	S012302-06	Lab sample id	S012302-01	Client sample id	B2B4X1
Dept sample id	7767-006	Dept sample id	7767-001	Location/Matrix	600-287-PL EB (Day 1) WATER
		Received	12/22/10	Collected/Volume	12/19/10 07:05 10.0 L
				Custody/SAF No	F11-040-008 F11-040

QC-DUP#1 76588

600-287-PL - QC Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-007 B2B4X3

MATRIX SPIKE

SDG 7767 Client/Case no CHPRC SDG H4474

Contact N. Joseph Verville Contract No. 33677

MATRIX SPIKE	ORIGINAL	
Lab sample id S012302-07	Lab sample id S012302-02	Client sample id B2B4X3
Dept sample id 7767-007	Dept sample id 7767-002	Location/Matrix 600-287-PL FB 1 WATER
	Received 12/22/10	Collected/Volume 12/19/10 10:30 10.0 L
		Custody/SAF No F11-040-010 F11-040

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	22400	360	149	30.0	X	H	22700	910	23.7	88	99	84-116	60-140

QC-MS#2 76589

600-287-PL - QC Sampling

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-001 B2B4X1

DATA SHEET

SDG	7767	Client/Case no	CHPRC SDG H4474
Contact	N. Joseph Verville	Contract	No. 33677
Lab sample id	S012302-01	Client sample id	B2B4X1
Dept sample id	7767-001	Location/Matrix	600-287-PL EB (Day 1) WATER
Received	12/22/10	Collected/Volume	12/19/10 07:05 10.0 L
		Custody/SAF No	F11-040-008 F11-040

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	20.8	86	145	30.0	U	H
Nickel 63	13981-37-8	-0.668	1.7	2.88	15.0	U	NI_L
Total Strontium	SR-RAD	-0.046	0.35	0.711	2.00	U	SR
Technetium 99	14133-76-7	-0.409	1.4	3.87	15.0	U	TC
Thorium 228	14274-82-9	0.018	0.11	0.202		U	TH
Thorium 230	14269-63-7	-0.146	0.15	0.348	1.00	U	TH
Thorium 232	TH-232	0.018	0.036	0.139	1.00	U	TH
Uranium 233/234	U-233/234	0	0.061	0.234	1.00	U	U
Uranium 235	15117-96-1	0	0.074	0.283	1.00	U	U
Uranium 238	U-238	0	0.061	0.234	1.00	U	U
Americium 241	14596-10-2	0	0.13	0.366	1.00	U	AM
Plutonium 238	13981-16-3	-0.042	0.084	0.322	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.084	0.322	1.00	U	PU
Tin 126	15832-50-5	U		15.0		U	GAM
Beryllium 7	13966-02-4	U		56.1		U	GAM
Potassium 40	13966-00-2	U		91.1		U	GAM
Cobalt 60	10198-40-0	U		7.65	25.0	U	GAM
Ruthenium 106	13967-48-1	U		59.6		U	GAM
Antimony 125	14234-35-6	U		17.8		U	GAM
Cesium 134	13967-70-9	U		8.75		U	GAM
Cesium 137	10045-97-3	U		6.67	15.0	U	GAM
Europium 152	14683-23-9	U		20.1	50.0	U	GAM
Europium 154	15585-10-1	U		19.8	50.0	U	GAM
Europium 155	14391-16-3	U		21.8	50.0	U	GAM
Niobium 94	14681-63-1	U		6.54		U	GAM
Radium 226	13982-63-3	U		17.1		U	GAM
Radium 228	15262-20-1	U		31.8		U	GAM

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/10

DATA SHEET, cont

SDG	7767	Client/Case no	CHPRC SDG_H4474
Contact	N. Joseph Verville	Contract	No. 33677
Lab sample id	S012302-01	Client sample id	B2B4X1
Dept sample id	7767-001	Location/Matrix	600-287-PL EB (Day 1) WATER
Received	12/22/10	Collected/Volume	12/19/10 07:05 10.0 L
		Custody/SAF No	F11-040-008 F11-040

600-287-PL - QC Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-002 B2B4X3

DATA SHEET

SDG 7767	Client/Case no CHPRC		SDG H4474
Contact N. Joseph Verville	Contract No. 33677		
Lab sample id S012302-02	Client sample id B2B4X3		
Dept sample id 7767-002	Location/Matrix 600-287-PL FB 1		WATER
Received 12/22/10	Collected/Volume 12/19/10 10:30	10.0 L	
	Custody/SAF No F11-040-010	F11-040	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	23.7	88	147	30.0	U	H
Nickel 63	13981-37-8	-0.336	1.7	2.89	15.0	U	NI_L
Total Strontium	SR-RAD	0.024	0.34	0.696	2.00	U	SR
Technetium 99	14133-76-7	-0.259	1.4	3.29	15.0	U	TC
Thorium 228	14274-82-9	0.141	0.14	0.226		U	TH
Thorium 230	14269-63-7	-0.118	0.14	0.399	1.00	U	TH
Thorium 232	TH-232	0.047	0.047	0.180	1.00	U	TH
Uranium 233/234	U-233/234	-0.032	0.064	0.244	1.00	U	U
Uranium 235	15117-96-1	0	0.077	0.296	1.00	U	U
Uranium 238	U-238	0	0.064	0.244	1.00	U	U
Americium 241	14596-10-2	0.170	0.20	0.376	1.00	U	AM
Plutonium 238	13981-16-3	0	0.085	0.325	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.085	0.325	1.00	U	PU
Tin 126	15832-50-5	U		10.7		U	GAM
Beryllium 7	13966-02-4	U		64.1		U	GAM
Potassium 40	13966-00-2	120	92	85.8			GAM
Cobalt 60	10198-40-0	U		10.8	25.0	U	GAM
Ruthenium 106	13967-48-1	U		75.4		U	GAM
Antimony 125	14234-35-6	U		18.6		U	GAM
Cesium 134	13967-70-9	U		11.6		U	GAM
Cesium 137	10045-97-3	U		9.32	15.0	U	GAM
Europium 152	14683-23-9	U		22.8	50.0	U	GAM
Europium 154	15585-10-1	U		26.5	50.0	U	GAM
Europium 155	14391-16-3	U		18.5	50.0	U	GAM
Niobium 94	14681-63-1	U		8.57		U	GAM
Radium 226	13982-63-3	U		17.6		U	GAM
Radium 228	15262-20-1	U		37.6		U	GAM

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/10

DATA SHEET, cont

SDG	7767	Client/Case no	CHPRC SDG H4474
Contact	N. Joseph Verville	Contract	No. 33677
Lab sample id	S012302-02	Client sample id	B2B4X3
Dept sample id	7767-002	Location/Matrix	600-287-PL FB 1 WATER
Received	12/22/10	Collected/Volume	12/19/10 10:30 10.0 L
		Custody/SAF No	F11-040-010 F11-040

600-287-PL - QC Sampling

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

7767-003 B2B4X4

DATA SHEET

SDG	7767	Client/Case no	CHPRC SDG H4474
Contact	N. Joseph Verville	Contract	No. 33677
Lab sample id	S012302-03	Client sample id	B2B4X4
Dept sample id	7767-003	Location/Matrix	600-287-PL TB1 WATER
Received	12/22/10	Collected/Volume	12/19/10 07:30 0.125 L
		Custody/SAF No	F11-040-011 F11-040

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	-2.67	88	149	30.0	U	H

600-287-PL - QC Sampling

Lab id	EBRLNE
Protocol	CHPRC
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test AM Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

AMERICIUM 241 IN WATER
ALPHA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch 7287-006						
S012302-01			7767-001	B2B4X1	U	
S012302-02			7767-002	B2B4X3	U	
S012302-04			7767-004	Lab Control Sample	ok	
S012302-05			7767-005	Method Blank	U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 8.0 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	0.366	0.500			68		114			9	12/28/10	12/28	SS-051
S012302-02			B2B4X3	0.376	0.500			69		114			9	12/28/10	12/28	SS-053
S012302-04			Lab Control Sample	0.410	0.500			64		108				12/28/10	12/29	SS-051
S012302-05			Method Blank	0.289	0.500			75		109				12/28/10	12/29	SS-052
S012302-06			Duplicate (S012302-01)	0.320	0.500			77		104			9	12/28/10	12/28	SS-050
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-040	Environmental Water Dissolution, rev 9
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.352 ± 0.096
YIELD 71 ± 11

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test PU Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER
ALPHA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240	
Preparation batch 7287-006								
S012302-01			7767-001	B2B4X1	U		U	
S012302-02			7767-002	B2B4X3	U		U	
S012302-04			7767-004	Lab Control Sample	ok		ok	
S012302-05			7767-005	Method Blank	U		U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/L)	1.00		1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 8.0 %		Reference Lab Notebook No. 7287 pg.006											
S012302-01			B2B4X1	0.322	0.500			61		108			9	12/28/10	12/28	SS-031
S012302-02			B2B4X3	0.325	0.500			61		108			9	12/28/10	12/28	SS-032
S012302-04			Lab Control Sample	0.402	0.500			64		108				12/28/10	12/28	SS-033
S012302-05			Method Blank	0.410	0.500			58		109				12/28/10	12/29	SS-053
S012302-06			Duplicate (S012302-01)	0.201	0.500			69		153			10	12/28/10	12/29	SS-032
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 FOR 5 SAMPLES			
	MDA	0.332	± 0.168
	YIELD	63	± 8

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test TH Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 228		Thorium 230		Thorium 232	
Preparation batch 7287-006										
S012302-01			7767-001	B2B4X1	U		U		U	
S012302-02			7767-002	B2B4X3	U		U		U	
S012302-04			7767-004	Lab Control Sample			ok			
S012302-05			7767-005	Method Blank	U		U		U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U	-	U	-	U
Nominal values and limits from method				RDLs (pCi/L)			1.00		1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 8.0 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	0.348	0.500			94		152			10	12/29/10	12/29	SS-040
S012302-02			B2B4X3	0.399	0.500			76		156			10	12/29/10	12/29	SS-031
S012302-04			Lab Control Sample	0.354	0.500			89		157				12/29/10	12/29	SS-032
S012302-05			Method Blank	0.368	0.500			92		157				12/29/10	12/29	SS-033
S012302-06			Duplicate (S012302-01)	0.366	0.500			88		153			10	12/29/10	12/29	SS-031
Nominal values and limits from method				1.00	0.500			30-110		150	100		180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	SPP-062	Sample Aliquoting, rev 1
	SPP-040	Environmental Water Dissolution, rev 2
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.367 ± 0.039
YIELD 88 ± 14

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test U Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 7287-006											
S012302-01			7767-001	B2B4X1	U	U	U				
S012302-02			7767-002	B2B4X3	U	U	U				
S012302-04			7767-004	Lab Control Sample	ok	HIGH	ok				
S012302-05			7767-005	Method Blank	U	U	U				
S012302-06			7767-006	Duplicate (S012302-01)	- 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	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 8.0 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	0.283	0.500			81		109			9	12/28/10	12/28	SS-037
S012302-02			B2B4X3	0.296	0.500			81		109			9	12/28/10	12/28	SS-038
S012302-04			Lab Control Sample	0.805	0.500			97		109				12/28/10	12/28	SS-039
S012302-05			Method Blank	0.250	0.500			88		109				12/28/10	12/28	SS-040
S012302-06			Duplicate (S012302-01)	0.224	0.500			90		104			9	12/28/10	12/28	SS-047
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	UISO_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 FOR 5 SAMPLES
MDA 0.372 ± 0.488
YIELD 87 ± 13

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test SR Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN WATER

BETA COUNTING

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium	
Preparation batch 7287-006						
S012302-01			7767-001	B2B4X1	U	
S012302-02			7767-002	B2B4X3	U	
S012302-04			7767-004	Lab Control Sample	ok	
S012302-05			7767-005	Method Blank	U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	2.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 10.4 % Reference Lab Notebook No. 7287 pg.006													
S012302-01			B2B4X1	0.711	0.500			85		100			8	12/27/10	12/27	GRB-221
S012302-02			B2B4X3	0.696	0.500			81		100			8	12/27/10	12/27	GRB-222
S012302-04			Lab Control Sample	0.513	0.500			82		150				12/27/10	12/27	GRB-225
S012302-05			Method Blank	0.818	0.500			85		100				12/27/10	12/27	GRB-224
S012302-06			Duplicate (S012302-01)	0.758	0.500			82		100			8	12/27/10	12/27	GRB-225
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 FOR 5 SAMPLES			
	MDA	0.699 ±	0.229
	YIELD	83 ±	4

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test TC Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

TECHNETIUM 99 IN WATER

BETA COUNTING

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99
Preparation batch 7287-006					
S012302-01			7767-001	B2B4X1	U
S012302-02			7767-002	B2B4X3	U
S012302-04			7767-004	Lab Control Sample	ok
S012302-05			7767-005	Method Blank	U
S012302-06			7767-006	Duplicate (S012302-01)	- U
Nominal values and limits from method				RDLs (pCi/L)	15.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 13.2 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	3.87	0.100			90	100				9	12/23/10	12/28	GRB-228
S012302-02			B2B4X3	3.29	0.100			82	200				9	12/23/10	12/28	GRB-229
S012302-04			Lab Control Sample	3.90	0.100			94	100					12/23/10	12/27	GRB-223
S012302-05			Method Blank	2.84	0.100			89	200					12/23/10	12/28	GRB-230
S012302-06			Duplicate (S012302-01)	4.31	0.100			63	200				9	12/23/10	12/28	GRB-231
Nominal values and limits from method				15.0	0.100			30-110	50				180			

PROCEDURES	REFERENCE	
	TC99_TR_SEP_GPC	
	SPP-062	Sample Aliquoting, rev 1
	CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 8
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 5 SAMPLES			
	MDA	3.64	± 1.15
	YIELD	84	± 25

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test GAM Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

GAMMA EMITTERS

GAMMA SPECTROSCOPY

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60		Cesium 137	
Preparation batch 7287-006								
S012302-01			7767-001	B2B4X1	U		U	
S012302-02			7767-002	B2B4X3	U		U	
S012302-04			7767-004	Lab Control Sample	ok		ok	
S012302-05			7767-005	Method Blank	U		U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/L)	25.0		15.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 7.0 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	37.7	0.500					301			3	12/22/10	12/22	MB,08,00
S012302-02			B2B4X3	36.7	0.500					302			3	12/22/10	12/22	01,01,00
S012302-04			Lab Control Sample	14.0	0.500					302				12/22/10	12/22	01,02,00
S012302-05			Method Blank	35.4	0.500					302				12/22/10	12/22	01,04,00
S012302-06			Duplicate (S012302-01)	29.1	0.500					519			3	12/22/10	12/22	MB,08,00
Nominal values and limits from method				15.0	0.500					100			180			

PROCEDURES

REFERENCE	GAMMA_GS	
SPP-007	Aqueous Sample Receipt by Chemistry Laboratory, rev 1	
SPP-100	Preparation of Sample for Gamma Spectroscopy, rev 0	

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 30.6 ± 19.7
YIELD _____ ± _____

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test H Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7287-006						
S012302-01			7767-001	B2B4X1	U	
S012302-02			7767-002	B2B4X3	U	
S012302-03			7767-003	B2B4X4	U	
S012302-04			7767-004	Lab Control Sample	ok	
S012302-05			7767-005	Method Blank	U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U
S012302-07			7767-007	Spike (S012302-02)	ok	X
Nominal values and limits from method				RDLs (pCi/L)	30.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 10.0 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	145	0.0100			100		200			4	12/23/10	12/23	LSC-006
S012302-02			B2B4X3	147	0.0100			100		200			4	12/23/10	12/23	LSC-006
S012302-03			B2B4X4	149	0.0100			100		200			4	12/23/10	12/23	LSC-006
S012302-04			Lab Control Sample	149	0.100			10		200				12/23/10	12/23	LSC-006
S012302-05			Method Blank	147	0.100			10		200				12/23/10	12/23	LSC-006
S012302-06			Duplicate (S012302-01)	147	0.0100			100		200			4	12/23/10	12/23	LSC-006
S012302-07			Spike (S012302-02)	149	0.0300			33		200			4	12/23/10	12/23	LSC-006
Nominal values and limits from method				30.0	0.0100					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-210 Tritium in Water Samples by Distillation, rev 11

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 148 ± 3.02
YIELD 65 ± 89

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

Test NI L Matrix WATER
SDG 7767
Contact N. Joseph Verville

LAB METHOD SUMMARY

NICKEL-63 IN LIQUID
LIQUID SCINTILLATION COUNTING

Client CHPRC
Contract No. 33677
Contract SDG H4474

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7287-006						
S012302-01			7767-001	B2B4X1	U	
S012302-02			7767-002	B2B4X3	U	
S012302-04			7767-004	Lab Control Sample	ok	
S012302-05			7767-005	Method Blank	U	
S012302-06			7767-006	Duplicate (S012302-01)	-	U
Nominal values and limits from method				RDLs (pCi/L)	15.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7287-006			2σ prep error 11.2 %	Reference Lab Notebook No. 7287 pg.006												
S012302-01			B2B4X1	2.88	0.500			97		50			10	12/28/10	12/29	LSC-007
S012302-02			B2B4X3	2.89	0.500			97		50			10	12/28/10	12/29	LSC-007
S012302-04			Lab Control Sample	2.95	0.500			94		50				12/28/10	12/29	LSC-007
S012302-05			Method Blank	2.94	0.500			96		50				12/28/10	12/29	LSC-007
S012302-06			Duplicate (S012302-01)	2.88	0.500			97		50			10	12/28/10	12/29	LSC-007
Nominal values and limits from method				15.0	0.500			40-110		50			180			

PROCEDURES
REFERENCE NI63_LSC
SPP-040 Environmental Water Dissolution, rev 2
CP-280 Nickel-63 Purification, rev 5

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 2.91 ± 0.068
YIELD 96 ± 3

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 12/30/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4474

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
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SAMPLE SUMMARY

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

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

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

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

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

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
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Case no SDG_H4474

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

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Version Ver 1.0
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Version 3.06
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Contact N. Joseph Verville

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WORK SUMMARY

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

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

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

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

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GUIDE, cont.

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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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.

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
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LAB CONTROL SAMPLE

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

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

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

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

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

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

  2. The error of ADDED.

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

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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GUIDE, cont.

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DUPLICATE

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

* The RPD is underlined if it is greater than either limit.

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

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

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

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

Lab id EBRLNE
Protocol CHPRC
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 12/30/10

SDG 7767
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG_H4474

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.

SDG 7767
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC
Contract No. 33677
Case no SDG_H4474

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'

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.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
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Case no SDG_H4474

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

SDG 7767
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC
Contract No. 33677
Case no SDG_H4474

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.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-040-008	PAGE 1 OF 2
COLLECTOR: Chamberlain	COMPANY CONTACT: WIDRIG, DL H4474	TELEPHONE NO.: 376-2858 (7767)	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: C01	DATA TURNAROUND: 12 Days / 12 Days
SAMPLING LOCATION: 600-287-PL EB 1 (Day 1)	PROJECT DESIGNATION: 600-287-PL - QC Sampling		SAF NO.: F11-040	AIR QUALITY: ☐	
ICE CHEST NO.: GWS-175	FIELD LOGBOOK NO.: HNF-N-507-16	ACTUAL SAMPLE DEPTH: N/A	COA: 302560ES10	METHOD OF SHIPMENT: FEDERAL EXPRESS	
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: ~~SEE PTR~~ bb 12/21/10 02581		BILL OF LADING/AIR BILL NO.: SEE PTR 794246233100		

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)

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	PRESERVATION	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	HNO3 to pH <2
				HOLDING TIME	6 Months	6 Months	6 Months	6 Months	6 Months	6 Months	6 Months	6 Months
				TYPE OF CONTAINER	P	G/P	G/P	G/P	G/P	G/P	G/P	G/P
				NO. OF CONTAINER(S)	1	1	1	1	1	2	2	1	1
				VOLUME	125mL	1000mL	1L	1L	1L	1L	1L	1L	1L
				SAMPLE ANALYSIS	TRITIUM - MIDLEVEL (Tritium);	Nickel-63 (Nickel-63);	Americium-241 (Americium-241);	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	Technetium-99 (Technetium-99);	Isotopic Thorium (Thorium-232);
B2B4X1	WATER	12-19-10	0705		X	X	X	X	X	X	X	X	X

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CHAIN OF POSSESSION	SIGN/ PRINT NAMES		
RELINQUISHED BY/REMOVED FROM: Via Chamberlain	DATE/TIME: 12-19-10 0742	RECEIVED BY/STORED IN: SSU #1	DATE/TIME: 12-19-10 0742
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: DEC 21 2010 0800	RECEIVED BY/STORED IN: SE Hamaker CHPRC	DATE/TIME: 0800 DEC 21 2010
RELINQUISHED BY/REMOVED FROM: SE Hamaker CHPRC	DATE/TIME: 1400 DEC 21 2010	RECEIVED BY/STORED IN: FED EX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FED EX	DATE/TIME:	RECEIVED BY/STORED IN: [illegible]	DATE/TIME: 12/22/10 1230
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:

SPECIAL INSTRUCTIONS: SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

☐ ORIGINAL

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

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-040-011	PAGE 1 OF 1
COLLECTOR: Chamberlain	COMPANY CONTACT: WIDRIG, DL H4474	TELEPHONE NO.: 376-2858 (7767)	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: C01	DATA TURNAROUND: 12 Days / 12 Days
SAMPLING LOCATION: 600-287-PL TB 1	PROJECT DESIGNATION: 600-287-PL - QC Sampling		SAF NO.: F11-040	AIR QUALITY: ☐	
ICE CHEST NO.: GWS-175	FIELD LOGBOOK NO.: HNF-N-507-16	ACTUAL SAMPLE DEPTH: N/A	COA: 302560ES10	METHOD OF SHIPMENT: FEDERAL EXPRESS	
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: SEE PTR bb 12/21/10 02518 02581		BILL OF LADING/AIR BILL NO.: SEE PTR 794246233100		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	None
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	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)	HOLDING TIME	6 Months
		TYPE OF CONTAINER	P
		NO. OF CONTAINER(S)	1
		VOLUME	125mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	TRITIUM - MIDLEVEL (Tritium);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B2B4X4	WATER	12-19-10	0730	X

51 each 55

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Guy Chamberlain DATE/TIME: 12-19-10/1621	RECEIVED BY/STORED IN: SSU-1 DATE/TIME: 12/19/10 1621	** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.☐** The laboratory shall report only the requested constituents of concern in all final data reports, and EDDs. QC results for non-requested constituents need not be reported, but samples chosen for matrix spike, and all spike compounds shall be identified in the final data report case narrative. No TICs shall be reported.☐** Per previous written agreement, the Laboratories shall report all final data for this sampling event on or before December 30, 2010. Contact the Project Coordinator for questions.
RELINQUISHED BY/REMOVED FROM: SSU #1 0800 12/21/10	RECEIVED BY/STORED IN: SE Hamaker 0800 12/21/10	
RELINQUISHED BY/REMOVED FROM: SE Hamaker CHPRC 12/21/10 1400	RECEIVED BY/STORED IN: FED EX	
RELINQUISHED BY/REMOVED FROM: FED EX DATE/TIME	RECEIVED BY/STORED IN: FEDEX 12/22/10 1220	
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

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-040-008	PAGE 2 OF 2
COLLECTOR Chamberlain	COMPANY CONTACT WIDRIG, DL H4474	TELEPHONE NO. 376-2858 (7767)	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE C01	DATA TURNAROUND
SAMPLING LOCATION 600-287-PL EB 1 (Day 1)	PROJECT DESIGNATION 600-287-PL - QC Sampling		SAF NO. F11-040	AIR QUALITY ☐	12 Days / 12 Days
ICE CHEST NO. GWS-175	FIELD LOGBOOK NO. HNF-N-507-16	ACTUAL SAMPLE DEPTH N/A	COA 302560ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. ~~SEE PTR~~ bb 121210 02581		BILL OF LADING/AIR BILL NO. SEE PTR 794246233100		

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.☐** The laboratory shall report only the requested constituents of concern in all final data reports, and EDDs. QC results for non-requested constituents need not be reported, but samples chosen for matrix spike, and all spike compounds shall be identified in the final data report case narrative. No TICs shall be reported.☐** Per previous written agreement, the Laboratories shall report all final data for this sampling event on or before December 30, 2010. Contact the Project Coordinator for questions.
(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155};
(2) Isotopic Plutonium {Plutonium-238, Plutonium-239/240};
(3) Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238};
(4) Strontium-89,90 -- Total Sr {Total beta radiostrontium};

ORIGINAL

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-040-010	PAGE 1 OF 2
COLLECTOR: Chamberlain	COMPANY CONTACT: WIDRIG, DL H4474	TELEPHONE NO.: 376-2858 (7767)	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: C01 / AIR QUALITY: ☐ / DATA TURNAROUND: 12 Days / 12 Days
SAMPLING LOCATION: 600-287-PL FB 1	PROJECT DESIGNATION: 600-287-PL - QC Sampling		SAF NO.: F11-040	
ICE CHEST NO.: GWS-175	FIELD LOGBOOK NO.: HNF-N-507-16	ACTUAL SAMPLE DEPTH: N/A	COA: 302560ES10	METHOD OF SHIPMENT: FEDERAL EXPRESS
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: ~~SEE PTR~~ bb 12/21/10 02581		BILL OF LADING/AIR BILL NO.: SEE PTR 794246233100	

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)

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS					
				None	6 Months	P	1	125mL	TRITIUM - MIDLEVEL (Tritium);					
				HNO3 to pH <2	6 Months	G/P	1	1000mL	Nickel-63 (Nickel-63);					
				HNO3 to pH <2	6 Months	G/P	1	1L	Americium-241 (Americium-241);					
				HNO3 to pH <2	6 Months	G/P	1	1L	SEE ITEM (1) IN SPECIAL INSTRUCTIONS					
				HNO3 to pH <2	6 Months	G/P	1	1L	SEE ITEM (2) IN SPECIAL INSTRUCTIONS					
				HNO3 to pH <2	6 Months	G/P	2	1L	SEE ITEM (3) IN SPECIAL INSTRUCTIONS					
				HNO3 to pH <2	6 Months	G/P	2	1L	SEE ITEM (4) IN SPECIAL INSTRUCTIONS					
				HCl to pH <2	6 Months	G/P	1	1L	Technetium-99 (Technetium-99);					
				HNO3 to pH <2	6 Months	G/P	1	1L	Isotopic Thorium (Thorium-232);					
53	SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
of 55	92B4X3	WATER	12-19-10	1030	X	X	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: Ing Chamberlain DATE/TIME: 12-19-10/1621	RECEIVED BY/STORED IN: SSU-1 DATE/TIME: 12-19-10/1621	SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: SSU #1 0800 DATE/TIME: DEC 21 2010	RECEIVED BY/STORED IN: SE Hamaker CHPRC 0800 DATE/TIME: DEC 21 2010	12/21/10 HH
RELINQUISHED BY/REMOVED FROM: SE Hamaker CHPRC DATE/TIME: DEC 21 2010/1400	RECEIVED BY/STORED IN: FED EX DATE/TIME:	☐ ORIGINAL
RELINQUISHED BY/REMOVED FROM: FED EX DATE/TIME:	RECEIVED BY/STORED IN: M. NATALSAAN 12/22/10 1250 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:	

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

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F11-040-010	PAGE 2 OF 2
COLLECTOR Chamberlain	COMPANY CONTACT WIDRIG, DL H4474	TELEPHONE NO. 376-2858 (7767)	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE C01	DATA TURNAROUND
SAMPLING LOCATION 600-287-PL FB 1	PROJECT DESIGNATION 600-287-PL - QC Sampling		SAF NO. F11-040	AIR QUALITY ☐	12 Days / 12 Days
ICE CHEST NO. GWS-175	FIELD LOGBOOK NO. HNF-N-507-16	ACTUAL SAMPLE DEPTH N/A	COA 302560ES10	METHOD OF SHIPMENT FEDERAL EXPRESS	
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. ~~SEE PTR~~ bb 12/2/10 62581		BILL OF LADING/AIR BILL NO. SEE PTR 794246233100		

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.☐** The laboratory shall report only the requested constituents of concern in all final data reports, and EDDs. QC results for non-requested constituents need not be reported, but samples chosen for matrix spike, and all spike compounds shall be identified in the final data report case narrative. No TICs shall be reported.☐** Per previous written agreement, the Laboratories shall report all final data for this sampling event on or before December 30, 2010. Contact the Project Coordinator for questions.
(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155};
(2) Isotopic Plutonium {Plutonium-238, Plutonium-239/240};
(3) Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238};
(4) Strontium-89,90 -- Total Sr {Total beta radiostrontium};

☐ ORIGINAL

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: CHPRC City RICHLAND State WA

Date/Time received 12/22/1230 CoC No. F11-040-008, 010, 011

Container I.D. No. GWS-175 Requested TAT (Days) 12 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [X]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [X]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [X]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [X]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [X]	
6.	Number of samples in shipping container: 3	Sample Matrix W		
7.	Number of containers per sample: _____	(Or see CoC X)		
8.	Samples are in correct container	Yes [X]	No [ ]	
9.	Paperwork agrees with samples?	Yes [X]	No [ ]	
10.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ]	Appropriate sample labels [X]		
11.	Samples are: In good condition [X] Leaking [ ] Broken Container [ ]	Missing [ ]		
12.	Samples are: Preserved [X] Not preserved [X] pH 1 / N/A	Preservative HNO_3		
13.	Describe any anomalies:			
14.	Was P.M. notified of any anomalies? Yes [ ] No [ ]	Date _____		
15.	Inspected by _____ Date 12/22/10	Time: 1300		

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

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 24 Sep 10