

May 12, 2014

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



May 12, 2014

Scot Fitzgerald
CH2M-HILL PRC
PO Box 1600
Richland, WA 99352

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF140659

Reference: (1) SOW, Mod 2, #36587, Release 3
(2) MSC-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Program Plan

This letter contains the following information for sample delivery group WSCF140659

- * Cover Sheet (Attachment 1)
- * Narrative (Attachment 2)
- * Analytical Results (Attachment 3)
- * Sample Receipt Information (Attachment 4)

Very truly yours,

A handwritten signature in black ink, appearing to read "Joseph Hale", is positioned above the typed name.

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

May 12, 2014

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF140659
Data Deliverable Date 05/12/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
S14-004	B2W7W4	140659001	WATER	04/10/14	04/10/14
S14-004	B2W7W5	140659002	WATER	04/10/14	04/10/14
S14-004	B2W7W0	140659003	WATER	04/10/14	04/10/14
X14-003	B2W3C0	140659004	WATER	04/10/14	04/10/14

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), to Contract 39818, Revision 4, "WSCF ANALYTICAL SERVICES FOR GROUNDWATER."*

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, C, D, J and U) may be applicable to this report, as appropriate.

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **C** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were C flagged (applies to inorganic and wet chemical analyses).
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **B (organic analyses)** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were B flagged.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.
- **o** – LCS recovery outside established laboratory acceptance limits.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

ICP-AES Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Organic Comments

VOA – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

Tracers are used to determine chemical yield. RPD is monitored in sample duplicate and is not required for tracer recovery per SOW.

Gross Alpha / Gross Beta:

- All applicable QC controls are within the established limits.

Strontium-89/90:

- All applicable QC controls are within the established limits.

Tritium:

- All applicable QC controls are within the established limits.

We 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 contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

May 12, 2014

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 35 pages
Including cover page

May 12, 2014

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF140659
Report Date May 12, 2014

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Marisol Avila

Solid samples results that have a 'Percent Solid' test are reported on a "dry weight basis", except results of TCLP, Percent Solid, and Total Activity. If no 'Percent Solid' test is reported then the results are reported on an "as received" basis.

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7005. Information designation of this report is the responsibility of the customer.

Batch QC List

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231738	232245	5	BLANK	108753	BLANK		ICP-6010 - All possible metals
231738	232245	7	LCS	108755	LCS		ICP-6010 - All possible metals
231738	232245	9	MS	108756	B2W848(140652011MS)	140652011	ICP-6010 - All possible metals
231738	232245	10	MSD	108757	B2W848(140652011MSD)	140652011	ICP-6010 - All possible metals
231738	232245	19	SAMPLE	140659001	B2W7W4		ICP-6010 - All possible metals
231738	232245	22	SAMPLE	140659002	B2W7W5		ICP-6010 - All possible metals
231738	232245	23	SAMPLE	140659003	B2W7W0		ICP-6010 - All possible metals
232868	233074	4	BLANK	109860	BLANK		3E-2008 ICP-MS 3 Elements
232868	233074	5	LCS	109861	LCS		3E-2008 ICP-MS 3 Elements
232868	233074	7	MS	109862	B2W6Y6(140649004MS)	140649004	3E-2008 ICP-MS 3 Elements
232868	233074	8	MSD	109863	B2W6Y6(140649004MSD)	140649004	3E-2008 ICP-MS 3 Elements
232868	233074	21	SAMPLE	140659001	B2W7W4		3E-2008 ICP-MS 3 Elements
232868	233074	22	SAMPLE	140659002	B2W7W5		3E-2008 ICP-MS 3 Elements
232868	233074	23	SAMPLE	140659003	B2W7W0		3E-2008 ICP-MS 3 Elements

Batch QC List

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231852	231853	1	BLANK	108882	BLANK		SW-846 8260B Volatiles
231852	231853	2	LCS	108883	LCS		SW-846 8260B Volatiles
231852	231853	3	MS	108884	B2V623(140657001MS)	140657001	SW-846 8260B Volatiles
231852	231853	4	MSD	108885	B2V623(140657001MSD)	140657001	SW-846 8260B Volatiles
231852	231853	21	SAMPLE	140659004	B2W3C0		SW-846 8260B Volatiles

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231557	232371	1	BLANK	108733	BLANK		GAB Discrete analysis Alpha only
231557	232371	2	LCS	108734	LCS		GAB Discrete analysis Alpha only
231557	232371	4	DUP	108735	B2W7V3(140653003DUP	140653003	GAB Discrete analysis Alpha only
231557	232371	6	SAMPLE	140659001	B2W7W4		GAB Discrete analysis Alpha only
231557	232371	7	SAMPLE	140659002	B2W7W5		GAB Discrete analysis Alpha only
231557	232371	8	SAMPLE	140659003	B2W7W0		GAB Discrete analysis Alpha only
231557	232372	1	BLANK	108733	BLANK		GAB Discrete analysis Beta only
231557	232372	2	LCS	108734	LCS		GAB Discrete analysis Beta only
231557	232372	4	DUP	108735	B2W7V3(140653003DUP	140653003	GAB Discrete analysis Beta only
231557	232372	6	SAMPLE	140659001	B2W7W4		GAB Discrete analysis Beta only
231557	232372	7	SAMPLE	140659002	B2W7W5		GAB Discrete analysis Beta only
231557	232372	8	SAMPLE	140659003	B2W7W0		GAB Discrete analysis Beta only
231567	232046	1	BLANK	108742	BLANK		Strontium 89/90 (GPC/GEA)
231567	232046	2	LCS	108743	LCS		Strontium 89/90 (GPC/GEA)
231567	232046	3	DUP	108744	B2W7V3(140653003DUP	140653003	Strontium 89/90 (GPC/GEA)
231567	232046	5	SAMPLE	140659001	B2W7W4		Strontium 89/90 (GPC/GEA)
231567	232046	6	SAMPLE	140659002	B2W7W5		Strontium 89/90 (GPC/GEA)
231567	232046	7	SAMPLE	140659003	B2W7W0		Strontium 89/90 (GPC/GEA)
231736	232345	1	BLANK	108745	BLANK		Tritium by LSC
231736	232345	2	LCS	108746	LCS		Tritium by LSC
231736	232345	4	DUP	108747	B2W233(140655003DUP)	140655003	Tritium by LSC
231736	232345	5	MSPK	108748	B2W233(140655003MSP		Tritium by LSC
231736	232345	6	SAMPLE	140659001	B2W7W4		Tritium by LSC

May 12, 2014

Batch QC List

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF140659

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231736	232345	7	SAMPLE	140659002	B2W7W5		Tritium by LSC
231736	232345	8	SAMPLE	140659003	B2W7W0		Tritium by LSC

Method Reference

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-505-411	Elemental Analysis by ICP Atomic Emission Spectroscopy (ICP AES)		
	EPA SW-846	6010C	Inductively Coupled Plasma-Atomic Emmission Spectrometry
	HEIS	6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emmission Spectrometry
LA-505-412	Determination of Trace Elements in Waters & Wastes by ICP Mass Spectrometry		
	EPA-600/R-94-111	200.8	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma
	HEIS	200.8_METALS_ICPMS	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma, Mass Spec.

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

Method Reference

Attention Scot Fitzgerald
Department Organic, Volatiles

Group # WSCF140659

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

Method Reference	Regulatory/Industry Method	Method ID	Method Description
LA-523-455	Volatile Sample Analysis by SW-846 Method 8260B		
	EPA SW-846	8000B	Determinative Chromographic Separations
	EPA SW-846	8260B	Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
	HEIS	8260_VOA_GCMS	Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

Method Reference

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-218-413	Tritium By Ion Removal Using Eichrom Resin Columns (Prep)	
	N/A	PREP METHOD
LA-220-406	Strontium-89 and 90 in Aqueous Samples by SR-SPEC Separation	
	HEIS	SRTOT_SEP_PRECIP_GPC Strontium 89/90, by Sr-Spec Sep.
LA-508-421	Operation of the Tri-Carb Model 2500TR Liquid Scintillation Analyzer	
	HEIS	ALPHA_LSC A/B Liquid Scintillation
	HEIS	BETA_LSC A/B Liquid Scintillation
	HEIS	TC99_3MDSK_LSC TC99 by Liquid Scintillation
	HEIS	TRITIUM_EIE_LSC Tritium, by Eichrome ion exchange, LSC
LA-548-401	Alpha and Beta in Liquid and Solid Samples - WSCF	
	N/A	PREP METHOD
LA-508-415	Operation Of The Protean 2-Inch Alpha/Beta Counting System For Gross Alpha/ Beta Samples	
	HEIS	ALPHA_GPC Gross Alpha by GPC
	HEIS	BETA_GPC Gross Beta by GPC
	HEIS	SRTOT_SEP_PRECIP_GPC Strontium beta isotopic, GPC

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659001
 SAF# S14-004
 Sample ID B2W7W4

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	04/23/14
Magnesium	7439-95-4	LA-505-411	U	<60		ug/L	1	60	750	04/23/14
Manganese	7439-96-5	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Nickel	7440-02-0	LA-505-411	U	<10		ug/L	1	10	40	04/23/14
Potassium	7440-09-7	LA-505-411	U	<250		ug/L	1	250	4000	04/23/14
Silver	7440-22-4	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Sodium	7440-23-5	LA-505-411	U	<100		ug/L	1	100	500	04/23/14
Antimony	7440-36-0	LA-505-411	U	<20		ug/L	1	20	60	04/23/14
Barium	7440-39-3	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Cadmium	7440-43-9	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Chromium	7440-47-3	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Cobalt	7440-48-4	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Copper	7440-50-8	LA-505-411	U	<4.0		ug/L	1	4.0	8.0	04/23/14
Vanadium	7440-62-2	LA-505-411	U	<5.0		ug/L	1	5.0	25	04/23/14
Zinc	7440-66-6	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Calcium	7440-70-2	LA-505-411	U	<50		ug/L	1	50	1000	04/23/14
Arsenic	7440-38-2	LA-505-411	U	<25		ug/L	1	25	30	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659001
 SAF# S14-004
 Sample ID B2W7W4

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep 3-Elements (W)										05/08/14
3E-2008 ICP-MS 3 Elements										
Arsenic	7440-38-2	LA-505-412	UD	<0.40		ug/L	2	0.40	4.0	05/08/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659002
 SAF# S14-004
 Sample ID B2W7W5

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	04/23/14
Magnesium	7439-95-4	LA-505-411		10400		ug/L	1	60	750	04/23/14
Manganese	7439-96-5	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Nickel	7440-02-0	LA-505-411	U	<10		ug/L	1	10	40	04/23/14
Potassium	7440-09-7	LA-505-411		6280		ug/L	1	250	4000	04/23/14
Silver	7440-22-4	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Sodium	7440-23-5	LA-505-411		16800		ug/L	1	100	500	04/23/14
Antimony	7440-36-0	LA-505-411	U	<20		ug/L	1	20	60	04/23/14
Barium	7440-39-3	LA-505-411		20.4		ug/L	1	4.0	20	04/23/14
Cadmium	7440-43-9	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Chromium	7440-47-3	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Cobalt	7440-48-4	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Copper	7440-50-8	LA-505-411	U	<4.0		ug/L	1	4.0	8.0	04/23/14
Vanadium	7440-62-2	LA-505-411		35.6		ug/L	1	5.0	25	04/23/14
Zinc	7440-66-6	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Calcium	7440-70-2	LA-505-411		31000		ug/L	1	50	1000	04/23/14
Arsenic	7440-38-2	LA-505-411	U	<25		ug/L	1	25	30	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659002
 SAF# S14-004
 Sample ID B2W7W5

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep 3-Elements (W)										05/08/14
3E-2008 ICP-MS 3 Elements										
Arsenic	7440-38-2	LA-505-412	D	8.50		ug/L	2	0.40	4.0	05/08/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659003
 SAF# S14-004
 Sample ID B2W7W0

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										04/23/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411		128		ug/L	1	40	50	04/23/14
Magnesium	7439-95-4	LA-505-411		14200		ug/L	1	60	750	04/23/14
Manganese	7439-96-5	LA-505-411		19.7		ug/L	1	4.0	5.0	04/23/14
Nickel	7440-02-0	LA-505-411	U	<10		ug/L	1	10	40	04/23/14
Potassium	7440-09-7	LA-505-411		6990		ug/L	1	250	4000	04/23/14
Silver	7440-22-4	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Sodium	7440-23-5	LA-505-411		20600		ug/L	1	100	500	04/23/14
Antimony	7440-36-0	LA-505-411	U	<20		ug/L	1	20	60	04/23/14
Barium	7440-39-3	LA-505-411		25.9		ug/L	1	4.0	20	04/23/14
Cadmium	7440-43-9	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Chromium	7440-47-3	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Cobalt	7440-48-4	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Copper	7440-50-8	LA-505-411	U	<4.0		ug/L	1	4.0	8.0	04/23/14
Vanadium	7440-62-2	LA-505-411	B	20.0		ug/L	1	5.0	25	04/23/14
Zinc	7440-66-6	LA-505-411		11.1		ug/L	1	5.0	10	04/23/14
Calcium	7440-70-2	LA-505-411		50900		ug/L	1	50	1000	04/23/14
Arsenic	7440-38-2	LA-505-411	U	<25		ug/L	1	25	30	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Sample # 140659003
 SAF# S14-004
 Sample ID B2W7W0

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep 3-Elements (W)										05/08/14
3E-2008 ICP-MS 3 Elements										
Arsenic	7440-38-2	LA-505-412	D	5.39		ug/L	2	0.40	4.0	05/08/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Sample # 140659004
 SAF# X14-003
 Sample ID B2W3C0

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for 8260B (W)										04/15/14
SW-846 8260B Volatiles										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Trichloroethene	79-01-6	LA-523-455	U	<0.5		ug/L	1	0.5	1	04/15/14
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Toluene	108-88-3	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	4	04/15/14
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Methyl isobutyl ketone	108-10-1	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Carbon tetrachloride	56-23-5	LA-523-455	J	1.5		ug/L	1	1	3	04/15/14
Acetone	67-64-1	LA-523-455	U	<5		ug/L	1	5	20	04/15/14
Chloroform	67-66-3	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
1,1,1-Trichloroethane	71-55-6	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Vinyl chloride	75-01-4	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Methylene chloride	75-09-2	LA-523-455		16		ug/L	1	1	5	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
 D - Analyte was reported at a secondary dilution factor.
 E - Exceeds the calibration range (GC/MS).
 J - Analyte < PQL (or EQL) >= MDL.
 N - Presumed evidence based on MS library search(GC/MS only)

T - GC/MS or N - Non GC/MS - MS/MSD recovery outside control limits
 U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Sample # 140659004
 SAF# X14-003
 Sample ID B2W3C0

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon disulfide	75-15-0	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
Methyl ethyl ketone	78-93-3	LA-523-455	U	<1		ug/L	1	1	5	04/15/14
1,1,2-Trichloroethane	79-00-5	LA-523-455	U	<1		ug/L	1	1	5	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE
 D - Analyte was reported at a secondary dilution factor.
 E - Exceeds the calibration range (GC/MS).
 J - Analyte < PQL (or EQL) >= MDL.
 N - Presumed evidence based on MS library search(GC/MS only)

T - GC/MS or N - Non GC/MS - MS/MSD recovery outside control limits
 U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Sample # 140659001
 SAF# S14-004
 Sample ID B2W7W4

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										04/24/14
GAB Discrete analysis Alpha only										
Gross Alpha	12587-46-1	LA-508-415	U	0.44	.75	pCi/L	1	1.2		05/06/14
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415	U	-2.4	1.9	pCi/L	1	3.3		05/06/14
Strontium 89/90 WATER/LIQUID PREP										04/17/14
Strontium 89/90 (GPC/GEA)										
Strontium-89_90	SR-RAD	LA-220-406	U	0.036	.52	pCi/L	1	0.91		04/23/14
Tritium by LSC EICHROM WA/LIQ PREP										04/15/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421	U	-83	180	pCi/L	1	300		04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - The associated QC sample Blank has a result > or = the MDA
 U - Analyzed for but not detected above limiting criteria.
 N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Sample # 140659002
 SAF# S14-004
 Sample ID B2W7W5

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										04/24/14
GAB Discrete analysis Alpha only										
Gross Alpha	12587-46-1	LA-508-415		2.8	1.8	pCi/L	1	1.7		05/06/14
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		100	21	pCi/L	1	3.7		05/06/14
Strontium 89/90 WATER/LIQUID PREP										04/17/14
Strontium 89/90 (GPC/GEA)										
Strontium-89_90	SR-RAD	LA-220-406	U	0.26	.55	pCi/L	1	0.93		04/23/14
Tritium by LSC EICHROM WA/LIQ PREP										04/15/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		2.5E4	5100	pCi/L	1	300		04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - The associated QC sample Blank has a result > or = the MDA
 U - Analyzed for but not detected above limiting criteria.
 N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Sample # 140659003
 SAF# S14-004
 Sample ID B2W7W0

Matrix WATER
 Sampled 04/10/14
 Received 04/10/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										04/24/14
GAB Discrete analysis Alpha only										
Gross Alpha	12587-46-1	LA-508-415		2.6	1.8	pCi/L	1	1.8		05/06/14
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		230	46	pCi/L	1	3.8		05/06/14
Strontium 89/90 WATER/LIQUID PREP										04/17/14
Strontium 89/90 (GPC/GEA)										
Strontium-89_90	SR-RAD	LA-220-406		2.1	.76	pCi/L	1	0.89		04/23/14
Tritium by LSC EICHROM WA/LIQ PREP										04/15/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		8300	1700	pCi/L	1	300		04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - The associated QC sample Blank has a result > or = the MDA
 U - Analyzed for but not detected above limiting criteria.
 N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Analytical Batch 231853 (QC Batch: 231852) Test SW-846 8260B Volatiles
 Associated Samples 140659004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108882								
1,1-Dichloroethene	75-35-4	<1		ug/L					U	04/15/14
Trichloroethene	79-01-6	<0.5		ug/L					U	04/15/14
Benzene	71-43-2	<1		ug/L					U	04/15/14
Toluene	108-88-3	<1		ug/L					U	04/15/14
Chlorobenzene	108-90-7	<1		ug/L					U	04/15/14
1,1-Dichloroethane	75-34-3	<1		ug/L					U	04/15/14
Ethylbenzene	100-41-4	<1		ug/L					U	04/15/14
1,2-Dichloroethane	107-06-2	<1		ug/L					U	04/15/14
Methyl isobutyl ketone	108-10-1	<1		ug/L					U	04/15/14
Tetrachloroethene	127-18-4	<1		ug/L					U	04/15/14
Total Xylenes	1330-20-7	<1		ug/L					U	04/15/14
Carbon tetrachloride	56-23-5	<1		ug/L					U	04/15/14
Acetone	67-64-1	<5		ug/L					U	04/15/14
Chloroform	67-66-3	<1		ug/L					U	04/15/14
1,1,1-Trichloroethane	71-55-6	<1		ug/L					U	04/15/14
Vinyl chloride	75-01-4	<1		ug/L					U	04/15/14
Methylene chloride	75-09-2	<1		ug/L					U	04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Carbon disulfide	75-15-0		<1	ug/L					U	04/15/14
Methyl ethyl ketone	78-93-3		<1	ug/L					U	04/15/14
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	04/15/14
LCS			QC Sample #108883							
1,1-Dichloroethene	75-35-4		20	ug/L	81.7	75 - 125				04/15/14
Trichloroethene	79-01-6		23	ug/L	93.4	75 - 125				04/15/14
Benzene	71-43-2		24	ug/L	96.5	75 - 125				04/15/14
Toluene	108-88-3		24	ug/L	95.6	75 - 125				04/15/14
Chlorobenzene	108-90-7		24	ug/L	95	75 - 125				04/15/14
1,1-Dichloroethane	75-34-3		22	ug/L	86.7	75 - 125				04/15/14
Ethylbenzene	100-41-4		25	ug/L	98.3	75 - 125				04/15/14
1,2-Dichloroethane	107-06-2		24	ug/L	96.2	75 - 125				04/15/14
1,1,1-Trichloroethane	71-55-6		22	ug/L	87.5	75 - 125				04/15/14
Carbon disulfide	75-15-0		24	ug/L	97.2	75 - 125				04/15/14
1,1,2-Trichloroethane	79-00-5		26	ug/L	103	75 - 125				04/15/14
MS			QC Sample #108884							
			Original 140657001							
1,1-Dichloroethene	75-35-4		21	ug/L	83.4	75 - 125				04/15/14
Trichloroethene	79-01-6		24	ug/L	94.9	75 - 125				04/15/14
Benzene	71-43-2		24	ug/L	97.2	75 - 125				04/15/14
Toluene	108-88-3		23	ug/L	93.1	75 - 125				04/15/14
Chlorobenzene	108-90-7		24	ug/L	94.1	75 - 125				04/15/14
1,1-Dichloroethane	75-34-3		21	ug/L	85.6	75 - 125				04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Ethylbenzene	100-41-4		25	ug/L	98.9	75 - 125				04/15/14
1,2-Dichloroethane	107-06-2		23	ug/L	93	75 - 125				04/15/14
1,1,1-Trichloroethane	71-55-6		22	ug/L	87.1	75 - 125				04/15/14
Carbon disulfide	75-15-0		21	ug/L	85.4	75 - 125				04/15/14
1,1,2-Trichloroethane	79-00-5		24	ug/L	96.8	75 - 125				04/15/14
MSD		QC Sample #108885								
		Original 140657001					Paired 108884			
1,1-Dichloroethene	75-35-4		21	ug/L	84.4	75 - 125	1.20	20		04/15/14
Trichloroethene	79-01-6		24	ug/L	96.6	75 - 125	1.50	20		04/15/14
Benzene	71-43-2		25	ug/L	98.5	75 - 125	1.30	20		04/15/14
Toluene	108-88-3		24	ug/L	96.3	75 - 125	3.40	20		04/15/14
Chlorobenzene	108-90-7		24	ug/L	95.4	75 - 125	1.40	20		04/15/14
1,1-Dichloroethane	75-34-3		21	ug/L	83.4	75 - 125	2.60	20		04/15/14
Ethylbenzene	100-41-4		25	ug/L	98.2	75 - 125	0.70	20		04/15/14
1,2-Dichloroethane	107-06-2		24	ug/L	96.7	75 - 125	3.90	20		04/15/14
1,1,1-Trichloroethane	71-55-6		25	ug/L	98.7	75 - 125	12.50	20		04/15/14
Carbon disulfide	75-15-0		24	ug/L	96.9	75 - 125	12.50	20		04/15/14
1,1,2-Trichloroethane	79-00-5		26	ug/L	103.6	75 - 125	6.80	20		04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Analytical Batch 232046 (QC Batch: 231567) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Strontium-89_90	SR-RAD		0.23	pCi/L					U	04/23/14
LCS										
Strontium-89_90	SR-RAD		34	pCi/L	92.7	80 - 120				04/23/14
DUP										
Strontium-89_90	SR-RAD		0.57	pCi/L			35.70	20	* U	04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Analytical Batch 232245 (QC Batch: 231738) Test ICP-6010 - All possible metals
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108753								
Iron	7439-89-6	<40		ug/L					U	04/23/14
Magnesium	7439-95-4	<60		ug/L					U	04/23/14
Manganese	7439-96-5	<4.0		ug/L					U	04/23/14
Nickel	7440-02-0	<10		ug/L					U	04/23/14
Potassium	7440-09-7	<250		ug/L					U	04/23/14
Silver	7440-22-4	<5.0		ug/L					U	04/23/14
Sodium	7440-23-5	<100		ug/L					U	04/23/14
Antimony	7440-36-0	<20		ug/L					U	04/23/14
Barium	7440-39-3	<4.0		ug/L					U	04/23/14
Cadmium	7440-43-9	<4.0		ug/L					U	04/23/14
Chromium	7440-47-3	<5.0		ug/L					U	04/23/14
Cobalt	7440-48-4	<4.0		ug/L					U	04/23/14
Copper	7440-50-8	<4.0		ug/L					U	04/23/14
Vanadium	7440-62-2	<5.0		ug/L					U	04/23/14
Zinc	7440-66-6	<5.0		ug/L					U	04/23/14
Calcium	7440-70-2	<50		ug/L					U	04/23/14
Arsenic	7440-38-2	<25		ug/L					U	04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
LCS		QC Sample #108755								
Iron	7439-89-6		1010	ug/L	100.7	80 - 120				04/23/14
Magnesium	7439-95-4		9940	ug/L	99.4	80 - 120				04/23/14
Manganese	7439-96-5		998	ug/L	99.8	80 - 120				04/23/14
Nickel	7440-02-0		978	ug/L	97.8	80 - 120				04/23/14
Potassium	7440-09-7		10000	ug/L	100.3	80 - 120				04/23/14
Silver	7440-22-4		988	ug/L	98.8	80 - 120				04/23/14
Sodium	7440-23-5		9890	ug/L	98.9	80 - 120				04/23/14
Antimony	7440-36-0		972	ug/L	97.2	80 - 120				04/23/14
Barium	7440-39-3		992	ug/L	99.2	80 - 120				04/23/14
Cadmium	7440-43-9		972	ug/L	97.2	80 - 120				04/23/14
Chromium	7440-47-3		974	ug/L	97.4	80 - 120				04/23/14
Cobalt	7440-48-4		1010	ug/L	100.6	80 - 120				04/23/14
Copper	7440-50-8		986	ug/L	98.6	80 - 120				04/23/14
Vanadium	7440-62-2		970	ug/L	97	80 - 120				04/23/14
Zinc	7440-66-6		959	ug/L	95.9	80 - 120				04/23/14
Calcium	7440-70-2		19900	ug/L	99.6	80 - 120				04/23/14
Arsenic	7440-38-2		974	ug/L	97.4	80 - 120				04/23/14
MS		QC Sample #108756								
		Original 140652011								
Iron	7439-89-6		1040	ug/L	103.6	75 - 125				04/23/14
Magnesium	7439-95-4		9460	ug/L	94.6	75 - 125				04/23/14
Manganese	7439-96-5		989	ug/L	98.9	75 - 125				04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Nickel	7440-02-0		965	ug/L	96.5	75 - 125				04/23/14
Potassium	7440-09-7		10000	ug/L	100	75 - 125				04/23/14
Silver	7440-22-4		993	ug/L	99.3	75 - 125				04/23/14
Sodium	7440-23-5		9800	ug/L	98	75 - 125				04/23/14
Antimony	7440-36-0		1000	ug/L	100	75 - 125				04/23/14
Barium	7440-39-3		982	ug/L	98.2	75 - 125				04/23/14
Cadmium	7440-43-9		989	ug/L	98.9	75 - 125				04/23/14
Chromium	7440-47-3		979	ug/L	97.9	75 - 125				04/23/14
Cobalt	7440-48-4		994	ug/L	99.4	75 - 125				04/23/14
Copper	7440-50-8		997	ug/L	99.7	75 - 125				04/23/14
Vanadium	7440-62-2		978	ug/L	97.8	75 - 125				04/23/14
Zinc	7440-66-6		964	ug/L	96.4	75 - 125				04/23/14
Calcium	7440-70-2		17900	ug/L	89.6	75 - 125				04/23/14
Arsenic	7440-38-2		1000	ug/L	100.4	75 - 125				04/23/14
MSD			QC Sample #108757							
			Original	140652011					Paired 108756	
Iron	7439-89-6		1060	ug/L	105.6	75 - 125	1.90	20		04/23/14
Magnesium	7439-95-4		9160	ug/L	91.6	75 - 125	1.60	20		04/23/14
Manganese	7439-96-5		988	ug/L	98.8	75 - 125	0.10	20		04/23/14
Nickel	7440-02-0		955	ug/L	95.5	75 - 125	1.10	20		04/23/14
Potassium	7440-09-7		9970	ug/L	99.7	75 - 125	0.30	20		04/23/14
Silver	7440-22-4		995	ug/L	99.5	75 - 125	0.30	20		04/23/14
Sodium	7440-23-5		9540	ug/L	95.4	75 - 125	1.50	20		04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

May 12, 2014

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Antimony	7440-36-0		979	ug/L	97.9	75 - 125	2.10	20		04/23/14
Barium	7440-39-3		977	ug/L	97.7	75 - 125	0.50	20		04/23/14
Cadmium	7440-43-9		967	ug/L	96.7	75 - 125	2.30	20		04/23/14
Chromium	7440-47-3		968	ug/L	96.8	75 - 125	1.10	20		04/23/14
Cobalt	7440-48-4		955	ug/L	95.5	75 - 125	4.00	20		04/23/14
Copper	7440-50-8		987	ug/L	98.7	75 - 125	1.00	20		04/23/14
Vanadium	7440-62-2		971	ug/L	97.1	75 - 125	0.70	20		04/23/14
Zinc	7440-66-6		947	ug/L	94.7	75 - 125	1.80	20		04/23/14
Calcium	7440-70-2		16800	ug/L	84.1	75 - 125	2.00	20		04/23/14
Arsenic	7440-38-2		981	ug/L	98.1	75 - 125	2.40	20		04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Analytical Batch 232345 (QC Batch: 231736) Test Tritium by LSC
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Tritium LCS	10028-17-8		-80	pCi/L					U	04/23/14
Tritium DUP	10028-17-8		3600	pCi/L	92	80 - 120				04/23/14
Tritium MSPK	10028-17-8		900	pCi/L			13.00	20		04/23/14
Tritium	10028-17-8		21000	pCi/L	100	75 - 125				04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Analytical Batch 232371 (QC Batch: 231557) Test GAB Discrete analysis Alpha only
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108733								
Gross Alpha LCS	12587-46-1	0.62		pCi/L					U	05/06/14
		QC Sample #108734								
Gross Alpha DUP	12587-46-1	53		pCi/L	88.6	80 - 120				05/06/14
		QC Sample #108735								
		Original 140653003								
Gross Alpha	12587-46-1	1.5		pCi/L			25.60	20	* U	05/06/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Analytical Batch 232372 (QC Batch: 231557) Test GAB Discrete analysis Beta only
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108733								
Gross Beta	12587-47-2		-2.0	pCi/L					U	05/06/14
LCS		QC Sample #108734								
Gross Beta	12587-47-2		240	pCi/L	97.7	80 - 120				05/06/14
DUP		QC Sample #108735								
		Original 140653003								
Gross Beta	12587-47-2		30	pCi/L			17.20	20		05/06/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140659

Analytical Batch 233074 (QC Batch: 232868) Test 3E-2008 ICP-MS 3 Elements
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Arsenic LCS	7440-38-2		<0.20	ug/L					U	05/08/14
Arsenic MS	7440-38-2		37.0	ug/L	92.6	85 - 115				05/08/14
Arsenic MSD	7440-38-2		37.2	ug/L	92.9	70 - 130				05/08/14
Arsenic	7440-38-2		35.1	ug/L	87.7	70 - 130	5.60	20	Paired 109862	05/08/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Analytical Batch 231853 (QC Batch: 231852) Test SW-846 8260B Volatiles
 Associated Samples 140659004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108882								
1,2-Dichloroethane-d4	17060-07-0				96.9	75 - 125				04/15/14
Toluene-d8	2037-26-5				105.9	75 - 125				04/15/14
4-Bromofluorobenzene	460-00-4				101.4	75 - 125				04/15/14
LCS		QC Sample #108883								
1,2-Dichloroethane-d4	17060-07-0				101.7	75 - 125				04/15/14
Toluene-d8	2037-26-5				104.8	75 - 125				04/15/14
4-Bromofluorobenzene	460-00-4				107.3	75 - 125				04/15/14
MS		QC Sample #108884								
		Original 140657001								
1,2-Dichloroethane-d4	17060-07-0				100.8	75 - 125				04/15/14
Toluene-d8	2037-26-5				104	75 - 125				04/15/14
4-Bromofluorobenzene	460-00-4				106.4	75 - 125				04/15/14
MSD		QC Sample #108885								
		Original 140657001								
1,2-Dichloroethane-d4	17060-07-0				102.6	75 - 125	n/a		Paired 108884	04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Volatiles

Group # WSCF140659

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Toluene-d8	2037-26-5				105.5	75 - 125	n/a			04/15/14
4-Bromofluorobenzene	460-00-4				104.8	75 - 125	n/a			04/15/14
SAMPLE			Sample #140659004							
1,2-Dichloroethane-d4	17060-07-0				104.5	75 - 125				04/15/14
Toluene-d8	2037-26-5				105.3	75 - 125				04/15/14
4-Bromofluorobenzene	460-00-4				111	75 - 125				04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140659

Analytical Batch 232046 (QC Batch: 231567) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 140659001, 140659002, 140659003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #108742							
Strontium Nitrate	10042-76-9			mg	85.1	25 - 105				04/23/14
LCS			QC Sample #108743							
Strontium Nitrate	10042-76-9			mg	91.7	25 - 105				04/23/14
DUP			QC Sample #108744							
			Original 140653003							
Strontium Nitrate	10042-76-9			mg	83.5	25 - 105	n/a			04/23/14
SAMPLE			Sample #140659001							
Strontium Nitrate	10042-76-9			mg	90.1	25 - 105				04/23/14
SAMPLE			Sample #140659002							
Strontium Nitrate	10042-76-9			mg	87.6	25 - 105				04/23/14
SAMPLE			Sample #140659003							
Strontium Nitrate	10042-76-9			mg	91.7	25 - 105				04/23/14

* - QC result out of range

n/a - Not Applicable

ATTACHMENT4

SAMPLE RECEIPT

Consisting of 6 pages
Including cover page

Waste Sampling and Characterization Facility
P.O. Box 650 S3-30, Richland WA 99352
Phone: (509) 373-7005/FAX: (509) 372-0456

ACKNOWLEDGEMENT OF SAMPLES RECEIVED

WSCF Laboratory

PO Box 650 S3-30
 Richland, WA 99352

ATTN: Scot Fitzgerald

Customer Code: CHPRC
CA CN: 401647
Work Order #: 140659
Customer Work ID: S14-004-238
Due Date: 05/12/2014 **(R031)**

The following samples were received from you on 4/10/2014 1:10:00 PM. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact WSCF Client Services. Thank you for using Waste Sampling and Characterization Facility.

Sample #	Sample ID	Matrix	Collected	Received
140659001	B2W7W4	WATER	4/10/2014 08:15	4/10/2014 13:10
Procedure		Compound List		
3E-2008 ICP-MS 3 Elements		As		
GAB Discrete analysis Alpha only		Alpha		
GAB Discrete analysis Beta only		Beta		
ICP-6010 - All possible metals		6010 ICP Common		
Strontium 89/90 (GPC/GEA)		SR89/90		
Tritium by LSC		H3		
Sample #	Sample ID	Matrix	Collected	Received
140659002	B2W7W5	WATER	4/10/2014 11:30	4/10/2014 13:10
Procedure		Compound List		
3E-2008 ICP-MS 3 Elements		As		
GAB Discrete analysis Alpha only		Alpha		
GAB Discrete analysis Beta only		Beta		
ICP-6010 - All possible metals		6010 ICP Common		
Strontium 89/90 (GPC/GEA)		SR89/90		
Tritium by LSC		H3		
Sample #	Sample ID	Matrix	Collected	Received
140659003	B2W7W0	WATER	4/10/2014 12:36	4/10/2014 13:10
Procedure		Compound List		
3E-2008 ICP-MS 3 Elements		As		
GAB Discrete analysis Alpha only		Alpha		
GAB Discrete analysis Beta only		Beta		
ICP-6010 - All possible metals		6010 ICP Common		
Strontium 89/90 (GPC/GEA)		SR89/90		
Tritium by LSC		H3		
Sample #	Sample ID	Matrix	Collected	Received
140659004	B2W3C0 (X14-003)	WATER	4/10/2014 10:33	4/10/2014 13:10
Procedure		Compound List		
SW-846 8260B Volatiles		8260 GCM S Common		

Sample Receipt

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #
S14-004-239
Page 1 of 1

Collector	Jean Aguilar	Contact/Requester	Karen Waters-Fused	Telephone No.	509-376-4650
SAF No.	S14-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ES20
Project Title	SURV, APRIL 2014	Logbook No.	HNF-N-506_61 / 84	Ac. Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	SURV	Priority	31 Days	Offsite Property No.	N/A
POSSIBLE SAMPLE HAZARDS/REMARKS			SPECIAL INSTRUCTIONS		
** ** Catalyst Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/191A Dangerous Coord. Regulations but are not releasable per DOE Order 438.1.			Site Wide Generator Knowledge Information from applies. The CACH for analytical work at WSCF is 40.647.		
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					

Sample No.	Filter	Date	Time	Net/Type Container	Sample Analysis	Holdng Time	Preservative
B2W7W5 2	N	4-10-14	1130	1x500-mL G/P	200.3_METALS_ICPMS, A serie (1), 6010_METALS_ICP, COMMON	6 Months	HNO3 to pH <2
B2W/W5	N	W	W	1X500-mL G/P	ALPHA-GPC, DISCRETE, COMMON; BETA_GPC, COMMON	6 Months	HNO3 to pH <2
B2W7W5	N	W	W	1x1 L G/P	SRTOT_SEP_PRECIP_GFC, COMMON	6 Months	HNO3 to pH <2
B2W7W5	N	4-10-14	1130	1X250-mL G	TRITIUM_EIE_LSC, COMMON	6 Months	None

Chain of Custody

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Relinquished By: <i>Jean Aguilar</i>			APR 10 2014 12:51	Received By: <i>Frank Hill</i>			APR 10 2014 12:51	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By: <i>Frank Hill</i>			APR 10 2014 13:0	Received By: <i>W. Waters</i>			APR 10 2014 13:0	DS = Drum Solids TL = Tissue T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By:			Date/Time	Received By:			Date/Time	
Relinquished By:			Date/Time	Received By:			Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By:		Date/Time		

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A-6004-842 (REV 2)

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#
S14-004-237
Page 1 of 1

Collector	John Aguilera	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	S14-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071FESS20
Project Title	SURV. APRIL 2014	Logbook No.	HNF-N-506 61 / 86	Ice Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	SURV	Priority:	31 Days	Offsite Property No.	N/A
POSSIBLE SAMPLE HAZARDS/REMARKS			SPECIAL INSTRUCTIONS	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
*** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOT Order 458.1.			Site Waste Generator Knowledge Information Form applies. The CACH for analytical work at WSCF is 40647.		

Sample No	Filter	*	Date	Time	No. Type Container	Sample Analysis	Holding Time	Preservative
B2W7V0-7	N	W	4-10-14	1236	1x500-mL G/P	200.8 METALS ICPMS; Arsenic (1); 601C_METALS_ICP; COMMON	6 Months	HNO3 to pH <2
B2W7V0	N	W			1x500-mL G/P	ALPHA_GPC_DISCRETE; COMMON; BETA_GPC; COMMON	6 Months	HNO3 to pH <2
B2W7V0	N	W			1x1-L G/P	SRTCT_SER_PFCIP; GPC; COMMON	6 Months	I:NO3 to pH <2
B2W7V0	N	W	4-10-14	1236	1x250-mL G	IRIDIUM EIE; LSC; COMMON	6 Months	None

Chain of Custody

Reinquisitioned By	John Aguilera	Print	Sign	Date/Time	APR 10 2014 12:51	Received By	Franklin	Print	Sign	Date/Time	APR 10 2014	Matrix *	S = Soil SD = Sediment SL = Sludge W = Water A = Air
Reinquisitioned By	Franklin	Print	Sign	Date/Time	APR 10 2014	Received By	Vincent King	Print	Sign	Date/Time	APR 10 2014	Matrix *	DS = Dour Solids T = Tissue W1 = Waste L = Liquid V = Vegetation X = Others
Reinquisitioned By		Print	Sign	Date/Time		Received By		Print	Sign	Date/Time		Matrix *	
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)													

PRINTED 0 3/1/2014

A-6004-842 (REV 2)

CH2M/Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **X14-003-107**
 Page 1 of 1

Collector: Joan Aquilar	Contact/Requester: WATERS-HUSTED, K	Telephone No.: 376-4650
SAF No.: X14-003	Sampling Origin: LIANFORD SITE	Purchase Order/Charge Code: 300071ES20
Project Title: GW Sitewide Surv, FY14	Logbook No.: HNF-N-506 61 / 86	Ice Chest No.: N/A
Shipped To (Lab): Waste Sampling & Characterization	Method of Shipment: GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.: N/A
Protocol: SURV	Priority: 31 Days PRIORITY	Offsite Property No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
 Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA
 Dangerous Goods Regulations but are not releasable per DOE Order 438.1
 Batch with A.L.S. and W.SAFs.

SPECIAL INSTRUCTIONS
 Site Wide Generator Knowledge Information Form applies.
 The CACN for analytical work at WSCP is 401547
 FY13 and FY14 samples cannot be in the same SDG.

Sample No.	Filter	+	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2W3C0	N	W	4-0-14	1033	3x40 mL aGS*	8260_VCA_GCMS: COMMON	14 Days	HQ or H2SO4 to pH <2/Cool-4C
B2W3C0	N	W	4-10-14	1033	1x20-rL P	Activity Scan	6 Months	None

Chain of Custody

Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time	Matrix *
Joan Aquilar			APR 10 2014 1251	Frank Hill			APR 10 2014 1251	S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air
			APR 10 2014 1318	Vicki B. King			APR 10 2014 1318	US - Drum Solids DL - Drum Liquids L - Lique V - Vapour X - Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION			Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Dispose By			Date/Time	

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A-3004-842 (REV 2)