

June 03, 2014

Rev. 1

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



June 3, 2014

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

Dear Scot Fitzgerald,

REVISED131527 - 866839 [Report ID: 131527]

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 WSCF131527

- * 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

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ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF131527

Data Deliverable Date 01/13/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
S14-012	B2TJ26	131527001	WATER	12/13/13	12/13/13
S14-012	B2TJ13	131527002	WATER	12/13/13	12/13/13
S14-012	B2TJ19	131527003	WATER	12/13/13	12/13/13
S14-012	B2TKC2	131527004	WATER	12/13/13	12/13/13

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Attachment 2
Narrative Rev1
WSCF131527

Revision 1: This case narrative replaces the prior in its entirety. This revision is correcting the Gross Beta Total Propagated Error.

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

Attachment 2
Narrative Rev1
WSCF131527

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

Radiochemistry Comments

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

Gamma Energy Analysis:

- All applicable QC controls are within the established limits.

Gross Beta:

- Duplicate Relative Percent Difference(s) (RPD) did not meet the established laboratory limits. Duplicate Relative Percent Difference (RPD) does not apply to results below 5X the minimum detectable activity. No flags issued.
- All other applicable QC controls are within the established limits.

Tritium:

- All applicable QC controls are within the established limits.

Technetium-99:

- 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.

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 15 pages
Including cover page

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF131527
Report Date June 3, 2014

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Heather Medley

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.

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Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF131527

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
224899	225420	1	BLANK	102584	BLANK		Tritium by LSC
224899	225420	2	LCS	102585	LCS		Tritium by LSC
224899	225420	4	DUP	102586	B2THP3(131525005DUP)	131525005	Tritium by LSC
224899	225420	5	MSPK	102587	B2R4M1(131512001MSP)		Tritium by LSC
224899	225420	15	SAMPLE	131527001	B2TJ26		Tritium by LSC
224902	225226	1	BLANK	102588	BLANK		TC99 by Liquid Scintillation
224902	225226	2	LCS	102589	LCS		TC99 by Liquid Scintillation
224902	225226	4	DUP	102590	B2THW0(131504020DUP)	131504020	TC99 by Liquid Scintillation
224902	225226	5	MS	102591	B2THW0(131504020MS)	131504020	TC99 by Liquid Scintillation
224902	225226	18	SAMPLE	131527002	B2TJ13		TC99 by Liquid Scintillation
224902	225226	19	SAMPLE	131527003	B2TJ19		TC99 by Liquid Scintillation
224902	225226	20	SAMPLE	131527004	B2TKC2		TC99 by Liquid Scintillation
224915	225001	1	IBLANK	102635	IBLANK		Gamma Energy Analysis-general
224915	225001	2	LCS	102636	LCS		Gamma Energy Analysis-general
224915	225001	3	DUP	102637	B2THP3(131525005DUP)	131525005	Gamma Energy Analysis-general
224915	225001	5	SAMPLE	131527001	B2TJ26		Gamma Energy Analysis-general
224915	225001	6	SAMPLE	131527002	B2TJ13		Gamma Energy Analysis-general
224915	225001	7	SAMPLE	131527003	B2TJ19		Gamma Energy Analysis-general
224915	225001	8	SAMPLE	131527004	B2TKC2		Gamma Energy Analysis-general
225467	225808	1	BLANK	103199	BLANK		GAB Discrete analysis Beta only
225467	225808	2	LCS	103200	LCS		GAB Discrete analysis Beta only
225467	225808	4	DUP	103201	B2THY8(131519011DUP)	131519011	GAB Discrete analysis Beta only
225467	225808	8	SAMPLE	131527002	B2TJ13		GAB Discrete analysis Beta only

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Batch QC List

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF131527

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
225467	225808	9	SAMPLE	131527003	B2TJ19		GAB Discrete analysis Beta only
225467	225808	10	SAMPLE	131527004	B2TKC2		GAB Discrete analysis Beta only

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Method Reference

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF131527

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-508-481	Gamma Energy Analysis using the Canberra Genie Ssystem	
	HEIS	GAMMA_GS Gamma Energy Analysis
LA-438-402	Determination of Technetium-99 by RAD Disk Filtration & Liquid Scintillation Counting	
	N/A	PREP METHOD
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-548-421(LSC)	Preparation of Sample Mounts For Gamma Energy Analysis	
	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>

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Group # WSCF131527

Sample # 131527001
 SAF# S14-012
 Sample ID B2TJ26

Matrix WATER
 Sampled 12/13/13
 Received 12/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for GEA (W)										12/16/13
Gamma Energy Analysis-general										
Antimony-125	14234-35-6	LA-508-481	U	-7.5	11	pCi/L	1	18		12/16/13
Cesium-134	13967-70-9	LA-508-481	U	18	27	pCi/L	1	44		12/16/13
Cesium-137	10045-97-3	LA-508-481	U	1.6	4.3	pCi/L	1	7.5		12/16/13
Cobalt-60	10198-40-0	LA-508-481	U	-0.049	4.5	pCi/L	1	7.0		12/16/13
Europium-152	14683-23-9	LA-508-481	U	3.8	13	pCi/L	1	23		12/16/13
Europium-154	15585-10-1	LA-508-481	U	2.8	11	pCi/L	1	19		12/16/13
Europium-155	14391-16-3	LA-508-481	U	-1.0	16	pCi/L	1	28		12/16/13
Potassium-40	13966-00-2	LA-508-481	U	-81	71	pCi/L	1	130		12/16/13
Ruthenium-106	13967-48-1	LA-508-481	U	-9.0	37	pCi/L	1	61		12/16/13
Beryllium-7	13966-02-4	LA-508-481	U	-15	35	pCi/L	1	57		12/16/13
Tritium by LSC EICHROM WA/LIQ PREP										12/19/13
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		760	270	pCi/L	1	300		12/24/13

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.

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Group # WSCF131527

Sample # 131527002
 SAF# S14-012
 Sample ID B2TJ13

Matrix WATER
 Sampled 12/13/13
 Received 12/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										12/31/13
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		1.4E4	2800	pCi/L	1	4.0		01/06/14
Preparation for GEA (W)										12/16/13
Gamma Energy Analysis-general										
Antimony-125	14234-35-6	LA-508-481	U	10	20	pCi/L	1	35		12/17/13
Cesium-134	13967-70-9	LA-508-481	U	-2.7	41	pCi/L	1	73		12/17/13
Cesium-137	10045-97-3	LA-508-481	U	-2.2	7.7	pCi/L	1	13		12/17/13
Cobalt-60	10198-40-0	LA-508-481	U	2.1	8.3	pCi/L	1	15		12/17/13
Europium-152	14683-23-9	LA-508-481	U	-4.8	20	pCi/L	1	35		12/17/13
Europium-154	15585-10-1	LA-508-481	U	-5.6	22	pCi/L	1	38		12/17/13
Europium-155	14391-16-3	LA-508-481	U	-7.4	21	pCi/L	1	36		12/17/13
Potassium-40	13966-00-2	LA-508-481	U	-50	98	pCi/L	1	200		12/17/13
Ruthenium-106	13967-48-1	LA-508-481	U	58	61	pCi/L	1	120		12/17/13
Beryllium-7	13966-02-4	LA-508-481	U	16	61	pCi/L	1	110		12/17/13
TC99 by Liquid Scin. WATER/LIQUID PREP										12/16/13
TC99 by Liquid Scintillation										
Technetium-99	14133-76-7	LA-508-421		2.1E4	4100	pCi/L	1	6.9		12/17/13

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.

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Group # WSCF131527

Sample # 131527003
 SAF# S14-012
 Sample ID B2TJ19

Matrix WATER
 Sampled 12/13/13
 Received 12/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										12/31/13
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		3300	660	pCi/L	1	6.1		01/06/14
Preparation for GEA (W)										12/16/13
Gamma Energy Analysis-general										
Antimony-125	14234-35-6	LA-508-481	U	5.6	18	pCi/L	1	33		12/17/13
Cesium-134	13967-70-9	LA-508-481	U	3.1	41	pCi/L	1	71		12/17/13
Cesium-137	10045-97-3	LA-508-481	U	0.22	6.5	pCi/L	1	11		12/17/13
Cobalt-60	10198-40-0	LA-508-481	U	4.0	6.7	pCi/L	1	13		12/17/13
Europium-152	14683-23-9	LA-508-481	U	-6.3	19	pCi/L	1	32		12/17/13
Europium-154	15585-10-1	LA-508-481	U	-1.3	16	pCi/L	1	31		12/17/13
Europium-155	14391-16-3	LA-508-481	U	8.6	23	pCi/L	1	43		12/17/13
Potassium-40	13966-00-2	LA-508-481	U	-160	95	pCi/L	1	180		12/17/13
Ruthenium-106	13967-48-1	LA-508-481	U	-47	58	pCi/L	1	90		12/17/13
Beryllium-7	13966-02-4	LA-508-481	U	14	55	pCi/L	1	98		12/17/13
TC99 by Liquid Scin. WATER/LIQUID PREP										12/16/13
TC99 by Liquid Scintillation										
Technetium-99	14133-76-7	LA-508-421		4800	960	pCi/L	1	6.9		12/17/13

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.

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 Department Radiochemistry

Group # WSCF131527

Sample # 131527004
 SAF# S14-012
 Sample ID B2TKC2

Matrix WATER
 Sampled 12/13/13
 Received 12/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
GAB Prep for Discrete Analysis (W)										12/31/13
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		1.3E4	2700	pCi/L	1	3.1		01/06/14
Preparation for GEA (W)										12/16/13
Gamma Energy Analysis-general										
Antimony-125	14234-35-6	LA-508-481	U	4.5	21	pCi/L	1	38		12/17/13
Cesium-134	13967-70-9	LA-508-481	U	-0.14	57	pCi/L	1	96		12/17/13
Cesium-137	10045-97-3	LA-508-481	U	-3.2	8	pCi/L	1	14		12/17/13
Cobalt-60	10198-40-0	LA-508-481	U	0.52	8.5	pCi/L	1	15		12/17/13
Europium-152	14683-23-9	LA-508-481	U	-16	24	pCi/L	1	40		12/17/13
Europium-154	15585-10-1	LA-508-481	U	6.4	22	pCi/L	1	41		12/17/13
Europium-155	14391-16-3	LA-508-481	U	-17	30	pCi/L	1	47		12/17/13
Potassium-40	13966-00-2	LA-508-481	U	-37	120	pCi/L	1	250		12/17/13
Ruthenium-106	13967-48-1	LA-508-481	U	-9.5	76	pCi/L	1	130		12/17/13
Beryllium-7	13966-02-4	LA-508-481	U	45	72	pCi/L	1	130		12/17/13
TC99 by Liquid Scin. WATER/LIQUID PREP										12/16/13
TC99 by Liquid Scintillation										
Technetium-99	14133-76-7	LA-508-421		1.9E4	3800	pCi/L	1	6.9		12/17/13

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.

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Quality Control Report

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 Department Radiochemistry

Group # WSCF131527

Analytical Batch 225001 (QC Batch: 224915) Test Gamma Energy Analysis-general
 Associated Samples 131527001, 131527002, 131527003, 131527004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
IBLANK		QC Sample #102635								
Antimony-125	14234-35-6	8.9		pCi/L					U	12/17/13
Cesium-134	13967-70-9	-8.3		pCi/L					U	12/17/13
Cesium-137	10045-97-3	-0.22		pCi/L					U	12/17/13
Cobalt-60	10198-40-0	2.6		pCi/L					U	12/17/13
Europium-152	14683-23-9	4.1		pCi/L					U	12/17/13
Europium-154	15585-10-1	5.9		pCi/L					U	12/17/13
Europium-155	14391-16-3	13		pCi/L					U	12/17/13
Potassium-40	13966-00-2	-56		pCi/L					U	12/17/13
Ruthenium-106	13967-48-1	-82		pCi/L					U	12/17/13
Beryllium-7	13966-02-4	-55		pCi/L					U	12/17/13
LCS		QC Sample #102636								
Cesium-137	10045-97-3	6400		pCi/sample	106.3	80 - 120				12/19/13
Cobalt-60	10198-40-0	10000		pCi/sample	101.8	80 - 120				12/19/13
DUP		QC Sample #102637								
		Original 131525005								
Antimony-125	14234-35-6	-9.6		pCi/L			-4.30	20	U	12/17/13
Cesium-134	13967-70-9	-11		pCi/L			-90.30	20	* U	12/17/13

* - QC result out of range

n/a - Not Applicable

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 Department Radiochemistry

Group # WSCF131527

Analyte	CAS #	Original Found	QC Found	Units	% RecovLimits	RPD	RPD Limit	RQ	Analyzed
Cesium-137	10045-97-3		4.7	pCi/L		1398.00	20	* U	12/17/13
Cobalt-60	10198-40-0		0.56	pCi/L		163.50	20	* U	12/17/13
Europium-152	14683-23-9		7.6	pCi/L		59.80	20	* U	12/17/13
Europium-154	15585-10-1		-11	pCi/L		-185.50	20	* U	12/17/13
Europium-155	14391-16-3		3.5	pCi/L		74.70	20	* U	12/17/13
Potassium-40	13966-00-2		-32	pCi/L		-154.30	20	* U	12/17/13
Ruthenium-106	13967-48-1		18	pCi/L		87.30	20	* U	12/17/13
Beryllium-7	13966-02-4		-29	pCi/L		-57.20	20	* U	12/17/13

* - QC result out of range

n/a - Not Applicable

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Group # WSCF131527

Analytical Batch 225226 (QC Batch: 224902) Test TC99 by Liquid Scintillation
 Associated Samples 131527002, 131527003, 131527004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Technetium-99	14133-76-7		0.76	pCi/L					U	12/17/13
LCS										
Technetium-99	14133-76-7		270	pCi/L	103.5	80 - 120				12/17/13
DUP										
Technetium-99	14133-76-7		-0.030	pCi/L			-125.00	20	* U	12/17/13
MS										
Technetium-99	14133-76-7		1100	pCi/L	102.3	75 - 125				12/17/13

* - QC result out of range

n/a - Not Applicable

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Group # WSCF131527

Analytical Batch 225420 (QC Batch: 224899) Test Tritium by LSC
 Associated Samples 131527001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #102584								
Tritium LCS	10028-17-8		-39	pCi/L					U	12/24/13
		QC Sample #102585								
Tritium DUP	10028-17-8		3200	pCi/L	97	80 - 120				12/24/13
		QC Sample #102586								
		Original 131525005								
Tritium MSPK	10028-17-8		1100	pCi/L			1.90	20		12/24/13
		QC Sample #102587								
Tritium	10028-17-8		20000	pCi/L	91.2	75 - 125				12/24/13

* - QC result out of range

n/a - Not Applicable

REVISED131527 -

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF131527

Analytical Batch 225808 (QC Batch: 225467) Test GAB Discrete analysis Beta only
 Associated Samples 131527002, 131527003, 131527004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #103199								
Gross Beta	12587-47-2		-1.1	pCi/L					U	01/06/14
LCS		QC Sample #103200								
Gross Beta	12587-47-2		250	pCi/L	99.9	80 - 120				01/06/14
DUP		QC Sample #103201								
		Original 131519011								
Gross Beta	12587-47-2		12	pCi/L			71.80	20	* X	01/06/14

* - QC result out of range

n/a - Not Applicable

Attention: Scot Fitzgerald

Group #

WSCF131527

Quality Control Comments

Department Radiochemistry

103201

B2THY8(131519011DUP)

Analyte Gross Beta - GAB Discrete analysis Beta only

[1] The duplicate is outside of default RPD limits. RPD limit does not apply to results less than 5X the Minimum Detectable Concentration.

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 #: 131527
Customer Work ID: S14-012-432
Due Date: 01/13/2014

The following samples were received from you on 12/13/2013 2:20:00 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
131527001	B2TJ26	WATER	12/13/2013 12:08	12/13/2013 14:20
Procedure		Compound List		
Gamma Energy Analysis-general Tritium by LSC		GE A List-1 (10) H 3		
Sample #	Sample ID	Matrix	Collected	Received
131527002	B2TJ13	WATER	12/13/2013 14:02	12/13/2013 14:20
Procedure		Compound List		
GAB Discrete analysis Beta only Gamma Energy Analysis-general TC99 by Liquid Scintillation		Beta GE A List-1 (10) Tc-99		
Sample #	Sample ID	Matrix	Collected	Received
131527003	B2TJ19	WATER	12/13/2013 13:29	12/13/2013 14:20
Procedure		Compound List		
GAB Discrete analysis Beta only Gamma Energy Analysis-general TC99 by Liquid Scintillation		Beta GE A List-1 (10) Tc-99		
Sample #	Sample ID	Matrix	Collected	Received
131527004	B2TKC2	WATER	12/13/2013 14:02	12/13/2013 14:20
Procedure		Compound List		
GAB Discrete analysis Beta only Gamma Energy Analysis-general TC99 by Liquid Scintillation		Beta GE A List-1 (10) Tc-99		

Chain of Custody

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # S14-012-432
 Page 1 of 1

Collector	FM Hill CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-375-4950
SAT No.	S14-012	Sampling Origin	Hanford Site	Purchase Order/Change Code	300071ESS20
Project Title	SURV, DECEMBER 2013	Logbook No.	HNF-N-5065374	Ice Clear 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	
*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5600.5 (1990/1993)		Site Wide Generator Knowledge Information from applies The CAGN for analytical work at WSCF is 401647 FY 13 and FY14 samples cannot be in the same SDO.		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No.	Filter * Date Time	No/Type Container	Sample Analysis	Hold Time	Preservative
B21J26	N W 12/13/13 1208	1x500-mL G/P 1x250-mL G	GAMMA_GS: COMMON; GAMMA_GS: G/M 01 IRIDIUM_ELE_LSC: COMMON	6 Months	HNO3 to pH <2
B21J26	N W ↓ ↓			6 Months	None

Relinquished By	Print Signature	Date/Time	Received By	Print Signature	Date/Time	Matrix *
Relinquished By	FM Hill CHPRC	DEC 13 2013 1420	Received By		DEC 13 2013 1420	S = Soil SE = Sediment SD = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By		Date/Time	Received By		Date/Time	DS = Drum Solids DL = Down Leg Solids T = Tissue WT = Wipe L = Liquid V = Vegetation X = Other
Relinquished By		Date/Time	Received By		Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g. Return to customer, per the procedure, used in process)		Discarded By		Date/Time	

PRINTED ON 10/23/2013 A-8004-842 (REV 2)

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# S14-012-425
 Page 1 of 1

Collector: **FMH&I CHPRC** Contact/Requester: Karen Waters-Husted Telephone No. 509-376-4650
 SAF No. S14-012 Sampling Origin: Hanford Site Purchase Order/Charge Code: 300071ESS20
 Project Title: SURV, DECEMBER 2013 Logbook No. HNF-N-50653/75
 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: SPECIAL INSTRUCTIONS: Had Time
 *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1980/1993). Site Wide Generator Knowledge Information Form applies. The CACR for analytical work at WSCF is 401647. FY13 and FY14 samples cannot be in the same SDG.

Sample No.	Filter	Date	Time	Vol/Type Container	Sample Analysis	Holding Time	Preservative
B2-J13	N	W 12/13/13	1402	1x500-mL C/P	BETA_CPO: COMMON	6 Months	HNO3 to pH <2
B2-J13	N	W		1x500-mL G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B2-J13	N	W		1x1-L G/P	TC99_3MDSK_LSC: COMMON	6 Months	HCl to pH <2

Relinquished By: **FMH&I CHPRC** Print: *[Signature]* Sign: *[Signature]* Date/Time: DEC 13 2013 1420 Received By: **TA Emz** Print: *[Signature]* Sign: *[Signature]* Date/Time: DEC 13 2013 1420
 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:
 PRINTED ON 10/6/2013 A-6004-B12 (REV 2)

Matrix -

S	=	Soil	DS	=	Drum Soils
SE	=	Sediment	DL	=	Down Loads
SL	=	Solid	T	=	Tissue
SL	=	Sludge	W1	=	Wipe
W	=	Water	L	=	Liquid
O	=	Oil	V	=	Vegetation
A	=	Air	X	=	Other

Chain of Custody

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #
S14-012-424
Page 1 of 1

Collector: **FM Hill** / **CHPRC** Contact/Requester: **Karen Waters-Husted** Telephone No.: **309-376-4650**

SAF No.: **S14-012** Sampling Origin: **Hanford Site** Purchase Order/Charge Code: **300071ESS20**

Project Title: **SURV, DECEMBER 2013** Logbook No.: **INF-N-506 53/75** Ice Chest No.: **N/A**

Shipped To (Lab): **Waste Sampling & Characterization** Method of Shipment: **GOVERNMENT VEHICLE** Bill of Lading/Air Bill No.: **N/A**

Preced: **SURV** Priority: **31 Days** **PRIORITY** Office Property No.: **N/A**

POSSIBLE SAMPLE HAZARDS/REMARKS
 *** Contact Radiative Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5600.5 (19001.003)

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 Site Wide Generator Knowledge Information Form applies.
 This CACR for analytical work at WSCF is 401647
 FY13 and FY14 samples cannot be in the same SDC.

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Hold Time	Preservative
B2TKC2	N	W	12/13/13	1402	1x500-mL G/P	EETA_GPC: COMMON	6 Months	INO3 to pH <2
B2TKC2	N	W			1x500-mL G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B2TKC2	N	W			1x1-L G/P	TC99_3MDSK_LSC: COMMON	6 Months	HCl to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Relinquished By: FM Hill			DEC 13 2013 1420	Received By: <i>[Signature]</i>			DEC 13 2013 1420	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SL = Solid T = Tissue WL = Sludge W1 = Wipe W = Water L = Liquid C = Cell V = Vegetation A = Air 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 the procedure, used in process) Disposed By:								Date/Time

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