SAF-RC-238
Characterization of Surface Soils
At 100-K-64 & 100-K-111
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 8/27/13
INITIAL/DATE

COMMENTS:

SDG J01902 SAF-RC-238

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

Sample Location: 100-K Riparian sample area (focused Only)

Analytical Data Package Prepared For

Washington Closure Hanford

Radiochemical Analysis By

TestAmerica Inc

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: TARL

Data Package Contains 61 *Pages*

Report No.: 56663

Results in this report relate only to the sample(s) analyzed.

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
J01902	RC-238	J1RR98	J3H080461-1	M1K8C1AG	9M1K8C10	3221031
		J1RR98	J3H080461-1	M1K8C1AC	9M1K8C10	3221032
		J1RR98	J3H080461-1	M1K8C1AH	9M1K8C10	3221034
		J1RR98	J3H080461-1	M1K8C1AD	9M1K8C10	3221036
		J1RR98	J3H080461-1	M1K8C1AE	9M1K8C10	3221037
		J1RR98	J3H080461-1	M1K8C1AA	9M1K8C10	3225034
		J1RR98	J3H080461-1	M1K8C2AF	9M1K8C20	3235077

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

Washington Hanford Closure
2620 Fermi Avenue
Richland, WA 99354

August 26, 2013

Attention: Joan Kessner

SAF Number	:	RC-238
Date SDG Closed	:	August 8, 2013
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	J01902
Data Deliverable	:	15– Day / Summary

CASE NARRATIVE

I. Introduction

On August 8, 2013, one soil sample was received at TestAmerica for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Washington Closure Hanford (WCH) specific ID:

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1RR98	M1K8C	SOIL	08/08/13

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002
Gas Proportional Counting
Strontium-90 by method RL-GPC-010
Gamma Spectroscopy
Gamma Spec by method RL-GAM-001

Liquid Scintillation Counting
Tritium by method RL-LSC-005
Carbon-14 by method RL-LSC-008
Nickel-63 by method RL-LCS-017
Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy
Plutonium-238, -239/240 by method RL-ALP-002:
The LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Gas Proportional Counting
Strontium-90 by method RL-GPC-010:
The LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Gamma Spectroscopy
Gamma Spec by method RL-GAM-001:
The CRDL was not met for some of the analytes. Except as noted, the LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Liquid Scintillation Counting
Tritium by method RL-LSC-005:
The LCS failed in the original batch due to an analyst error. There was insufficient sample volume remaining to perform a reanalysis so a new LCS was prepared and recounted with the original batch. All final results are comparable with the original count and the LCS is within the acceptance criteria. Except as noted; the LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Carbon-14 by method RL-LSC-008:
The LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Nickel-63 by method RL-LCS-017:
The LCS, batch blank, sample and sample duplicate (J1RR98) results are within contractual requirements.

Chemical Analysis
Hexavalent Chromium by EPA method 7196A
The sample and sample duplicate (J1RR89) agreement is outside the acceptance limits. This maybe attributed to the inhomogeniety of the matrix. The matrix spike recovered low at 71%. The post digestive matrix spike recovered at 72% and the insoluble matrix spike recovered at 83%. This implies a reducing

capacity in the sample, but not enough to exhaust the more copious insoluble matrix spike. Except as noted; the LCS, batch blank, sample, sample duplicate (J1RR98) and sample matrix spike (J1RR98) results are within contractual requirements.

I certify that this Certificate of Analysis 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 hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Rhonda Wagar
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**TestAmerica Richland's SOP No.**
EPA 901.1	Cs-134, I-131	RL-GAM-001
EPA 900.0	Alpha & Beta	RL-GPC-001
EPA 00-02	Gross Alpha (Coprecipitation)	RL-GPC-002
EPA 903.0	Total Alpha Radium (Ra-226)	RL-RA-002
EPA 903.1	Ra-226	RL-RA-001
EPA 904.0	Ra-228	RL-RA-001
EPA 905.0	Sr-89/90	RL-GPC-003
ASTM D5174	Uranium	RL-KPA-003
EPA 906.0	Tritium	RL-LSC-005

Results in this report relate only to the sample(s) analyzed.

Uncertainty Estimation

TestAmerica Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/?n), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or TestAmerica.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) ***u_c – Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty.* The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or TestAmerica "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Date: 26-Aug-13

Report No. : 56663

SDG No: J01902

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3221034 C14_LSC									
J1RR98									
	M1K8C1AH	C-14	3.39E-01 +- 3.0E-01	U	pCi/g	100%	5.32E-01	5.00E+01	
J1RR98 DUP									
	M1K8C1AL	C-14	1.81E-01 +- 2.9E-01	U	pCi/g	100%	5.28E-01	5.00E+01	60.7
3221037 PUISO_PLATE_AEA									
J1RR98									
	M1K8C1AE	Pu-238	-3.03E-03 +- 3.0E-02	U	pCi/g	86%	7.25E-02	1.00E+00	
		PU239/40	1.33E-02 +- 3.0E-02	U	pCi/g	86%	6.54E-02	1.00E+00	
J1RR98 DUP									
	M1K8C1AP	Pu-238	-3.00E-03 +- 3.8E-02	U	pCi/g	83%	8.56E-02	1.00E+00	-0.9
		PU239/40	-2.25E-03 +- 3.8E-02	U	pCi/g	83%	8.09E-02	1.00E+00	281.3
3221031 GAMMA_GS									
J1RR98									
	M1K8C1AG	CO-60	5.49E-03 +- 2.1E-02	U	pCi/g		3.73E-02	5.00E-02	
		CS-137	9.60E-02 +- 3.4E-02		pCi/g		3.46E-02	1.00E-01	
		EU-152	2.75E-02 +- 5.4E-02	U	pCi/g		9.23E-02	1.00E-01	
		EU-154	-3.93E-02 +- 6.5E-02	U	pCi/g		1.10E-01	1.00E-01	
		EU-155	7.16E-02 +- 6.2E-02	U	pCi/g		1.08E-01	1.00E-01	
		K-40	1.67E+01 +- 2.1E+00		pCi/g		2.97E-01		
J1RR98 DUP									
	M1K8C1AJ	CO-60	8.27E-03 +- 2.8E-02	U	pCi/g		5.19E-02	5.00E-02	40.4
		CS-137	7.75E-02 +- 4.9E-02		pCi/g		5.54E-02	1.00E-01	21.3
		EU-152	-2.07E-02 +- 8.4E-02	U	pCi/g		1.27E-01	1.00E-01	1425.0
		EU-154	-5.65E-02 +- 9.2E-02	U	pCi/g		1.53E-01	1.00E-01	-36.0
		EU-155	1.31E-01 +- 8.4E-02	U	pCi/g		1.46E-01	1.00E-01	58.4
		K-40	1.71E+01 +- 2.4E+00		pCi/g		4.47E-01		2.2
3221032 SRTOT_SEP_PRECIP_GPC									
J1RR98									
	M1K8C1AC	STRONTIUM	1.83E-01 +- 1.2E-01	U	pCi/g	88%	2.29E-01		
J1RR98 DUP									
	M1K8C1AK	STRONTIUM	1.86E-02 +- 9.2E-02	U	pCi/g	88%	2.14E-01		163.1
3221036 NI63_LSC									
J1RR98									
	M1K8C1AD	Ni-63	3.04E+00 +- 3.3E+00	U	pCi/g	90%	5.36E+00	3.00E+01	
J1RR98 DUP									
	M1K8C1AN	Ni-63	8.16E-01 +- 3.0E+00	U	pCi/g	92%	5.00E+00	3.00E+01	115.3
3225034 7196_CR6									
J1RR98									

TestAmerica Inc

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RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

Sample Results Summary

Date: 26-Aug-13

TestAmerica Inc TARL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 56663 **SDG No:** J01902

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3225034 7196_CR6									
J1RR98									
	M1K8C1AA	HEXCHROME	4.66E+00 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	M1K8C1AT	HEXCHROME	1.59E+00 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	98.5
3235077 906.0_H3_LSC									
J1RR98									
	M1K8C2AF	H-3	5.58E-04 +- 2.8E-02	U	pCi/g	100%	6.45E-02	4.00E+02	
J1RR98 DUP									
	M1K8C2AM	H-3	1.33E-02 +- 3.0E-02	U	pCi/g	100%	6.64E-02	4.00E+02	183.9

No. of Results: 26

TestAmerica Inc

rptSTLRchSaSummary2 V5.2.23 A2002

RPD - Relative Percent Difference.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

QC Results Summary

Date: 26-Aug-13

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 56663 **SDG No.:** J01902

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
C14_LSC								
3221034 BLANK QC,								
M1LAK1AA	C-14	1.13E-01 +- 2.8E-01	U	pCi/g	100%			5.30E-01
3221034 LCS,								
M1LAK1AC	C-14	7.57E+00 +- 8.1E-01		pCi/g	100%	82%	-0.2	5.35E-01
PUISO_PLATE_AEA								
3221037 BLANK QC,								
M1LAQ1AA	Pu-238	-2.61E-03 +- 4.4E-02	U	pCi/g	72%			9.39E-02
	PU239/40	-1.74E-03 +- 4.4E-02	U	pCi/g	72%			8.74E-02
3221037 LCS,								
M1LAQ1AC	PU239/40	6.42E+00 +- 1.3E+00		pCi/g	79%	97%	0.0	1.13E-01
GAMMA_GS								
3221031 BLANK QC,								
M1LAG1AA	CO-60	8.49E-04 +- 1.2E-02	U	pCi/g				2.15E-02
	CS-137	9.59E-04 +- 1.1E-02	U	pCi/g				1.89E-02
	EU-152	-4.52E-02 +- 3.9E-02	U	pCi/g				5.47E-02
	EU-154	-3.90E-02 +- 3.4E-02	U	pCi/g				5.25E-02
	EU-155	-1.12E-02 +- 3.1E-02	U	pCi/g				5.26E-02
	K-40	3.61E-02 +- 1.6E-01	U	pCi/g				3.11E-01
3221031 LCS,								
M1LAG1AC	CS-137	9.85E-01 +- 1.2E-01		pCi/g		96%	0.0	2.84E-02
	RA-226	8.52E-01 +- 1.2E-01		pCi/g		75%	-0.3	4.52E-02
	RA-228	6.78E-01 +- 1.5E-01		pCi/g		96%	0.0	8.28E-02
	U-238	9.23E-01 +- 1.3E-01		pCi/g		77%	-0.2	5.08E-02
SRTOT_SEP_PRECIP_GPC								
3221032 BLANK QC,								
M1LAJ1AA	STRONTIUM	1.80E-02 +- 1.2E-01	U	pCi/g	69%			2.76E-01
3221032 LCS,								
M1LAJ1AC	STRONTIUM	2.83E+00 +- 7.2E-01		pCi/g	70%	126%	0.3	2.81E-01
NI63_LSC								
3221036 BLANK QC,								
M1LAP1AA	Ni-63	1.16E+01 +- 4.6E+00		pCi/g	60%			8.33E+00
3221036 LCS,								
M1LAP1AC	Ni-63	2.13E+02 +- 2.4E+01		pCi/g	71%	91%	-0.1	6.50E+00
7196_CR6								
3225034 MATRIX SPIKE, J1RR98								
M1K8C1AQ	HEXCHROME	2.47E+01 +- 0.0E+00		mg/kg	N/A	71%	-0.3	1.55E-01
3225034 LCS,								
M1LXX1AC	HEXCHROME	1.82E+01 +- 0.0E+00		mg/kg	N/A	96%	0.0	1.55E-01
3225034 BLANK QC,								
M1LXX1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01
906.0_H3_LSC								
3235077 BLANK QC,								

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A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

QC Results Summary

Date: 26-Aug-13

TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 56663

SDG No.: J01902

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
M1LAM2AA	H-3	-9.48E-03 +- 4.7E-02	U	pCi/g	100%			1.05E-01
3235077 LCS, M1P291AA	H-3	4.64E-01 +- 7.1E-02		pCi/g	100%	78%	-0.2	1.08E-01

No. of Results: 24

TestAmerica Inc

rptSTLRchQcSummary V5.2.23 A2002

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 26-Aug-13

Lab Name:	TestAmerica Inc	**SDG:**	J01902	**Collection Date:**	8/6/2013 9:46:00 AM
Lot-Sample No.:	J3H080461-1	**Report No. :**	56663	**Received Date:**	8/8/2013 1:54:00 PM
Client Sample ID:	J1RR98	**COC No. :**	RC-238-008	**Matrix:**	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3221031	GAMMA_GS			**Work Order:** M1K8C1AG			**Report DB ID:** 9M1K8C10					
CO-60	**5.49E-03**	U	2.1E-02	2.1E-02	3.73E-02	pCi/g		*0.15*	8/17/13 01:31 p		291.5	GER11$1
							5.00E-02	*0.53*			g	
CS-137	**9.60E-02**		3.4E-02	3.4E-02	3.46E-02	pCi/g		*(2.8)*	8/17/13 01:31 p		291.5	GER11$1
							1.00E-01	*(5.6)*			g	
EU-152	**2.75E-02**	U	5.4E-02	5.4E-02	9.23E-02	pCi/g		*0.3*	8/17/13 01:31 p		291.5	GER11$1
							1.00E-01	*(1.)*			g	
EU-154	**-3.93E-02**	U	6.5E-02	6.5E-02	1.10E-01	pCi/g		*-0.36*	8/17/13 01:31 p		291.5	GER11$1
							1.00E-01	*-(1.2)*			g	
EU-155	**7.16E-02**	U	6.2E-02	6.2E-02	1.08E-01	pCi/g		*0.67*	8/17/13 01:31 p		291.5	GER11$1
							1.00E-01	*(2.3)*			g	
K-40	**1.67E+01**		2.1E+00	2.1E+00	2.97E-01	pCi/g		*(56.2)*	8/17/13 01:31 p		291.5	GER11$1
								(16.)			g	
Batch: 3221032	SRTOT_SEP_PRECIP_GPC			**Work Order:** M1K8C1AC			**Report DB ID:** 9M1K8C10					
STRONTIUM	**1.83E-01**	U	1.2E-01	1.2E-01	2.29E-01	pCi/g	88%	*0.8*	8/21/13 07:41 a		3.02	GPC31A
						1.07E-01		*(3.)*			g	
Batch: 3221034	C14_LSC			**Work Order:** M1K8C1AH			**Report DB ID:** 9M1K8C10					
C-14	**3.39E-01**	U	2.4E-01	3.0E-01	5.32E-01	pCi/g	100%	*0.64*	8/22/13 02:01 p		4.015	LSC8
						2.54E-01	5.00E+01	*(2.3)*			g	
Batch: 3221036	NI63_LSC			**Work Order:** M1K8C1AD			**Report DB ID:** 9M1K8C10					
Ni-63	**3.04E+00**	U	2.3E+00	3.3E+00	5.36E+00	pCi/g	90%	*0.57*	8/21/13 07:44 p		0.52	LSC9
						2.56E+00	3.00E+01	*(1.8)*			g	

TestAmerica Inc
rptSTLRchSample
V5.2.23 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM I

SAMPLE RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc
Lot-Sample No.: J3H080461-1
Client Sample ID: J1RR98

SDG: J01902
Report No. : 56663
COC No. : RC-238-008

Collection Date: 8/6/2013 9:46:00 AM
Received Date: 8/8/2013 1:54:00 PM
Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3221037	PUISO_PLATE_AEA			**Work Order:**	M1K8C1AE		**Report DB ID:**	9M1K8C10				
Pu-238	**-3.03E-03**	U	3.0E-02	3.0E-02	7.25E-02	pCi/g	86%	*-0.04*	8/19/13 11:45 a		1.03	ALP37
						1.57E-02	1.00E+00	*-0.2*			g	
PU239/40	**1.33E-02**	U	3.0E-02	3.0E-02	6.54E-02	pCi/g	86%	*0.2*	8/19/13 11:45 a		1.03	ALP37
						1.22E-02	1.00E+00	*0.88*			g	
Batch: 3225034	7196_CR6			**Work Order:**	M1K8C1AA		**Report DB ID:**	9M1K8C10				
HEXCHROME	**4.66E+00**			0.0E+00	1.55E-01	mg/kg	N/A	*(30.1)*	8/21/13 07:54 a		2.521	
							1.55E-01	*N/A*			g	
Batch: 3235077	906.0_H3_LSC			**Work Order:**	M1K8C2AF		**Report DB ID:**	9M1K8C20				
H-3	**5.58E-04**	U	2.5E-02	2.8E-02	6.45E-02	pCi/g	100%	*0.01*	8/24/13 03:25 a		52.2	LSC3
						3.01E-02	4.00E+02	*0.04*			g	

No. of Results: 13 **Comments:**

TestAmerica Inc
rptSTLRchSample
V5.2.23 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM II

Date: 26-Aug-13

DUPLICATE RESULTS

Lab Name:	TestAmerica Inc	**SDG:**	J01902	**Collection Date:**	8/6/2013 9:46:00 AM
Lot-Sample No.:	J3H080461-1	**Report No. :**	56663	**Received Date:**	8/8/2013 1:54:00 PM
Client Sample ID:	J1RR98	**COC No. :**	RC-238-008	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3225034	7196_CR6			**Work Order:** M1K8C1AT		**Report DB ID:** M1K8C1ER			**Orig Sa DB ID:** 9M1K8C10			
HEXCHROME	1.59E+00			0.0E+00	1.55E-01	mg/kg	N/A	(10.2)	8/21/13 07:54 a		2.503	
	4.66E+00		**RPD**	**98.5**		1.55E-01		N/A			g	

No. of Results: 1 **Comments:**

TestAmerica Inc
rptSTLRchDupV5.
2.23 A2002

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

Date: 26-Aug-13

DUPLICATE RESULTS

Lab Name:	TestAmerica Inc	**SDG:**	J01902	**Collection Date:**	8/6/2013 9:46:00 AM
Lot-Sample No.:	J3H080461-1	**Report No. :**	56663	**Received Date:**	8/8/2013 1:54:00 PM
Client Sample ID:	J1RR98 DUP	**COC No. :**	RC-238-008	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3221031	GAMMA_GS			**Work Order:**	M1K8C1AJ	**Report DB ID:**	M1K8C1JR		**Orig Sa DB ID:** 9M1K8C10			
CO-60	8.27E-03	U	2.8E-02	2.8E-02	5.19E-02	pCi/g		0.16	8/17/13 05:15 p		278.0	GER7$1
	5.49E-03	U	**RPD**	**40.4**		5.00E-02		0.58			g	
CS-137	7.75E-02		4.9E-02	4.9E-02	5.54E-02	pCi/g		(1.4)	8/17/13 05:15 p		278.0	GER7$1
	9.60E-02		**RPD**	**21.3**		1.00E-01		(3.2)			g	
EU-152	-2.07E-02	U	8.4E-02	8.4E-02	1.27E-01	pCi/g		-0.16	8/17/13 05:15 p		278.0	GER7$1
	2.75E-02	U	**RPD**	**1425.0**		1.00E-01		-0.49			g	
EU-154	-5.65E-02	U	9.2E-02	9.2E-02	1.53E-01	pCi/g		-0.37	8/17/13 05:15 p		278.0	GER7$1
	-3.93E-02	U	**RPD**	**-36.0**		1.00E-01		-(1.2)			g	
EU-155	1.31E-01	U	8.4E-02	8.4E-02	1.46E-01	pCi/g		0.89	8/17/13 05:15 p		278.0	GER7$1
	7.16E-02	U	**RPD**	**58.4**		1.00E-01		(3.1)			g	
K-40	1.71E+01		2.4E+00	2.4E+00	4.47E-01	pCi/g		(38.1)	8/17/13 05:15 p		278.0	GER7$1
	1.67E+01		**RPD**	**2.2**				(14.5)			g	
Batch: 3221032	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M1K8C1AK	**Report DB ID:**	M1K8C1KR		**Orig Sa DB ID:** 9M1K8C10			
STRONTIUM	1.86E-02	U	9.2E-02	9.2E-02	2.14E-01	pCi/g	88%	0.09	8/21/13 07:41 a		3.03	GPC31B
	1.83E-01	U	**RPD**	**163.1**				0.4			g	
Batch: 3221034	C14_LSC			**Work Order:**	M1K8C1AL	**Report DB ID:**	M1K8C1LR		**Orig Sa DB ID:** 9M1K8C10			
C-14	1.81E-01	U	2.3E-01	2.9E-01	5.28E-01	pCi/g	100%	0.34	8/22/13 02:22 p		4.043	LSC8
	3.39E-01	U	**RPD**	**60.7**		5.00E+01		(1.3)			g	
Batch: 3221036	NI63_LSC			**Work Order:**	M1K8C1AN	**Report DB ID:**	M1K8C1NR		**Orig Sa DB ID:** 9M1K8C10			

TestAmerica Inc
rptSTLRchDupV5.
2.23 A2002

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM II

Date: 26-Aug-13

DUPLICATE RESULTS

Lab Name:	TestAmerica Inc	**SDG:**	J01902	**Collection Date:**	8/6/2013 9:46:00 AM
Lot-Sample No.:	J3H080461-1	**Report No. :**	56663	**Received Date:**	8/8/2013 1:54:00 PM
Client Sample ID:	J1RR98 DUP	**COC No. :**	RC-238-008	**Matrix:**	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Ni-63	8.16E-01	U	2.0E+00	3.0E+00	5.00E+00	pCi/g	92%	0.16	8/21/13 08:05 p		0.54	LSC9
	3.04E+00	U	**RPD**	**115.3**		3.00E+01		0.55			g	
Batch: 3221037	PUISO_PLATE_AEA			**Work Order:** M1K8C1AP		**Report DB ID:** M1K8C1PR			**Orig Sa DB ID:** 9M1K8C10			
Pu-238	-3.00E-03	U	3.8E-02	3.8E-02	8.56E-02	pCi/g	83%	-0.04	8/19/13 11:46 a		1.0	ALP39
	-3.03E-03	U	**RPD**	**-0.9**		1.00E+00		-0.16			g	
PU239/40	-2.25E-03	U	3.8E-02	3.8E-02	8.09E-02	pCi/g	83%	-0.03	8/19/13 11:46 a		1.0	ALP39
	1.33E-02	U	**RPD**	**281.3**		1.00E+00		-0.12			g	
Batch: 3235077	906.0_H3_LSC			**Work Order:** M1K8C2AM		**Report DB ID:** M1K8C2MR			**Orig Sa DB ID:** 9M1K8C20			
H-3	1.33E-02	U	2.7E-02	3.0E-02	6.64E-02	pCi/g	100%	0.2	8/24/13 04:09 a		53.8	LSC3
	5.58E-04	U	**RPD**	**183.9**		4.00E+02		0.89			g	

No. of Results: 12 **Comments:**

RPD - Relative Percent Difference.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc

Matrix: SOIL

SDG: J01902

Report No. : 56663

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3225034	7196_CR6			**Work Order:**	M1LXX1AA		**Report DB ID:**	M1LXX1AB				
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	1.	8/21/13 07:54 a		2.5	
						1.55E-01		N/A			g	
Batch: 3221034	C14_LSC			**Work Order:**	M1LAK1AA		**Report DB ID:**	M1LAK1AB				
C-14	1.13E-01	U	2.2E-01	2.8E-01	5.30E-01	pCi/g	100%	0.21	8/22/13 02:43 p		4.042	LSC8
					2.53E-01	5.00E+01		0.8			g	
Batch: 3221037	PUISO_PLATE_AEA			**Work Order:**	M1LAQ1AA		**Report DB ID:**	M1LAQ1AB				
Pu-238	-2.61E-03	U	4.4E-02	4.4E-02	9.39E-02	pCi/g	72%	-0.03	8/19/13 11:47 a		1.03	ALP40
					1.75E-02	1.00E+00		-0.12			g	
PU239/40	-1.74E-03	U	4.4E-02	4.4E-02	8.74E-02	pCi/g	72%	-0.02	8/19/13 11:47 a		1.03	ALP40
					1.43E-02	1.00E+00		-0.08			g	
Batch: 3221036	NI63_LSC			**Work Order:**	M1LAP1AA		**Report DB ID:**	M1LAP1AB				
Ni-63	1.16E+01		3.4E+00	4.6E+00	8.33E+00	pCi/g	60%	(1.4)	8/21/13 08:26 p		0.5	LSC9
					3.97E+00	3.00E+01		(5.)			g	
Batch: 3235077	906.0_H3_LSC			**Work Order:**	M1LAM2AA		**Report DB ID:**	M1LAM2AB				
H-3	-9.48E-03	U	4.1E-02	4.7E-02	1.05E-01	pCi/g	100%	-0.09	8/24/13 04:52 a		57.8	LSC3
					4.89E-02	4.00E+02		-0.41			g	
Batch: 3221031	GAMMA_GS			**Work Order:**	M1LAG1AA		**Report DB ID:**	M1LAG1AB				
CO-60	8.49E-04	U	1.2E-02	1.2E-02	2.15E-02	pCi/g		0.04	8/17/13 05:16 p		348.0	GER10$1
						5.00E-02		0.14			g	
CS-137	9.59E-04	U	1.1E-02	1.1E-02	1.89E-02	pCi/g		0.05	8/17/13 05:16 p		348.0	GER10$1
						1.00E-01		0.18			g	

TestAmerica Inc
rptSTLRchBlank
V5.2.23 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM II

BLANK RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc

SDG: J01902

Matrix: SOIL

Report No. : 56663

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
EU-152	-4.52E-02	U	3.9E-02	3.9E-02	5.47E-02	pCi/g		-0.83	8/17/13 05:16 p		348.0	GER10$1
						1.00E-01		-(2.3)			g	
EU-154	-3.90E-02	U	3.4E-02	3.4E-02	5.25E-02	pCi/g		-0.74	8/17/13 05:16 p		348.0	GER10$1
						1.00E-01		-(2.3)			g	
EU-155	-1.12E-02	U	3.1E-02	3.1E-02	5.26E-02	pCi/g		-0.21	8/17/13 05:16 p		348.0	GER10$1
						1.00E-01		-0.72			g	
K-40	3.61E-02	U	1.6E-01	1.6E-01	3.11E-01	pCi/g		0.12	8/17/13 05:16 p		348.0	GER10$1
								0.45			g	
Batch: 3221032	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M1LAJ1AA		**Report DB ID:**	M1LAJ1AB				
STRONTIUM	1.80E-02	U	1.2E-01	1.2E-01	2.76E-01	pCi/g	69%	0.07	8/21/13 07:41 a		3.01	GPC31D
					1.28E-01			0.31			g	

No. of Results: 13 **Comments:**

TestAmerica Inc
rptSTLRchBlank
V5.2.23 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda/Mdl, Total Uncert, CRDL, RDL or not identified by gamma scan software.

FORM II

LCS RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc

SDG: J01902

Matrix: SOIL

Report No. : 56663

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3225034	7196_CR6			**Work Order:**	M1LXX1AC		**Report DB ID:**	M1LXX1AS					
HEXCHROME	1.82E+01			0.0E+00	1.55E-01	mg/kg	N/A	1.90E+01		96%	8/21/13 07:54 a	2.5	
							Rec Limits:	80	120	0.0		g	
Batch: 3221034	C14_LSC			**Work Order:**	M1LAK1AC		**Report DB ID:**	M1LAK1CS					
C-14	7.57E+00		4.9E-01	8.1E-01	5.35E-01	pCi/g	100%	9.22E+00	1.8E-01	82%	8/22/13 03:04 p	4.015	LSC8
							Rec Limits:			-0.2		g	
Batch: 3221037	PUISO_PLATE_AEA			**Work Order:**	M1LAQ1AC		**Report DB ID:**	M1LAQ1CS					
PU239/40	6.42E+00		6.6E-01	1.3E+00	1.13E-01	pCi/g	79%	6.62E+00	2.0E-01	97%	8/19/13 11:48 a	1.04	ALP41
							Rec Limits:	70	130	0.0		g	
Batch: 3221036	NI63_LSC			**Work Order:**	M1LAP1AC		**Report DB ID:**	M1LAP1CS					
Ni-63	2.13E+02		8.5E+00	2.4E+01	6.50E+00	pCi/g	71%	2.34E+02	3.9E+00	91%	8/21/13 08:47 p	0.54	LSC9
							Rec Limits:	70	130	-0.1		g	
Batch: 3235077	906.0_H3_LSC			**Work Order:**	M1P291AA		**Report DB ID:**	M1P291AS					
H-3	4.64E-01		6.5E-02	7.1E-02	1.08E-01	pCi/g	100%	5.97E-01	1.8E-02	78%	8/24/13 05:35 a	61.5	LSC3
							Rec Limits:	70	130	-0.2		g	
Batch: 3221031	GAMMA_GS			**Work Order:**	M1LAG1AC		**Report DB ID:**	M1LAG1CS					
CS-137	9.85E-01		1.2E-01	1.2E-01	2.84E-02	pCi/g		1.03E+00	1.1E-02	96%	8/17/13 05:17 p	350.1	GER11$1
							Rec Limits:	70	130	0.0		g	
RA-226	8.52E-01		1.2E-01	1.2E-01	4.52E-02	pCi/g		1.14E+00	1.2E-02	75%	8/17/13 05:17 p	350.1	GER11$1
							Rec Limits:	70	130	-0.3		g	
RA-228	6.78E-01		1.5E-01	1.5E-01	8.28E-02	pCi/g		7.06E-01	7.3E-03	96%	8/17/13 05:17 p	350.1	GER11$1
							Rec Limits:	70	130	0.0		g	

TestAmerica Inc **Bias** - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V5.2.23 A2002

FORM II

LCS RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc

Matrix: SOIL

SDG: J01902

Report No. : 56663

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDL	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
U-238	9.23E-01		1.3E-01	1.3E-01	5.08E-02	pCi/g		1.20E+00	1.2E-02	77%	8/17/13 05:17 p	350.1	GER11$1
							Rec Limits:	70	130	-0.2		g	
Batch: 3221032	SRTOT_SEP_PRECIP_GPC			**Work Order:**	M1LAJ1AC		**Report DB ID:**	M1LAJ1CS					
STRONTIUM	2.83E+00		3.1E-01	7.2E-01	2.81E-01	pCi/g	70%	2.25E+00	4.7E-02	126%	8/21/13 07:41 a	3.02	GPC32A
							Rec Limits:	70	130	0.3		g	

No. of Results: 10 **Comments:**

TestAmerica Inc **Bias** - (Result/Expected)-1 as defined by ANSI N13.30.

rptSTLRchLcs
V5.2.23 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 26-Aug-13

Lab Name: TestAmerica Inc **SDG:** J01902

Lot-Sample No.: J3H080461-1, J1RR98 **Report No. :** 56663 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Rpt Unit, CRDL	Yield	Rec-overy	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 3225034	**Work Order:** M1K8C1AQ			**Report DB ID:** M1K8C1CW			**Orig Sa DB ID:** 9M1K8C10					
HEXCHROME	2.47E+01			0.0E+00	1.55E-01	mg/kg	N/A	70.67%	3.49E+01	8/21/13 07:54 a	2.5008	7196_CR6
	4.66E+00										g	

Number of Results: 1

Comments:

TestAmerica Inc
rptSTLRchMs
V5.2.23 A2002

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
Bias - (Result/Expected)-1 as defined by ANSI N13.30.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/22/2013 8:21:48 AM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3221037; RPUISO Pulso by ALP
SDG, Matrix: J01902; SOIL

		Yes	No	N/A
1.0 COC				
1.1	Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	✓		
2.0 QC Batch				
2.1	Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2.2	Are the QC appropriate for the analysis included in the batch?	✓		
2.3	Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	✓		
2.4	Does the Worksheets include a Tracer Vial label for each sample?	✓		
3.0 QC & Samples				
3.1	Is the blank results, yield, and MDA within contract limits?	✓		
3.2	Is the LCS result, yield, and MDA within contract limits?	✓		
3.3	Are the MS/MSD results, yields, and MDA within contract limits?			✓
3.4	Are the duplicate result, yields, and MDAs within contract limits?	✓		
3.5	Are the sample yields and MDAs within contract limits?	✓		
4.0 Raw Data				
4.1	Were results calculated in the correct units?	✓		
4.2	Were analysis volumes entered correctly?	✓		
4.3	Were Yields entered correctly?			✓
4.4	Were spectra reviewed/meet contractual requirements?	✓		
4.5	Were raw counts reviewed for anomalies?	✓		
5.0 Other				
5.1	Are all nonconformances included and noted?			✓
5.2	Are all required forms filled out?	✓		
5.3	Was the correct methodology used?	✓		
5.4	Was transcription checked?	✓		
5.5	Were all calculations checked at a minimum frequency?			✓
5.6	Are worksheet entries complete and correct?	✓		

6.0 Comments on any No response:

First Level Lisa Autorson **Date** 8/22/13

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist

RADIOCHEMISTRY

Second Level Review

Batch Number: 3221037

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: CRDL = 1.0 pci/g

Second Level Review: [signature] Date: 8/22/13

LS-038B, Rev. 10, 9/07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/21/2013 12:32:18 PM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3221032; RSRTOT SrTot by GPC
SDG, Matrix: J01902; SOIL

1.0 COC			
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓	No	N/A
2.0 QC Batch			
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓	No	N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓	No	N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓	No	N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes ✓	No	N/A
3.0 QC & Samples			
3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓	No	N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes	No	N/A ✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes ✓	No	N/A
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓	No	N/A
4.0 Raw Data			
4.1 Were results calculated in the correct units?	Yes ✓	No	N/A
4.2 Were analysis volumes entered correctly?	Yes ✓	No	N/A
4.3 Were Yields entered correctly?	Yes ✓	No	N/A
4.4 Were spectra reviewed/meet contractual requirements?	Yes	No	N/A ✓
4.5 Were raw counts reviewed for anomalies?	Yes ✓	No	N/A
5.0 Other			
5.1 Are all nonconformances included and noted?	Yes	No	N/A ✓
5.2 Are all required forms filled out?	Yes ✓	No	N/A
5.3 Was the correct methodology used?	Yes ✓	No	N/A
5.4 Was transcription checked?	Yes ✓	No	N/A
5.5 Were all calculations checked at a minimum frequency?	Yes	No	N/A ✓
5.6 Are worksheet entries complete and correct?	Yes ✓	No	N/A
6.0 Comments on any No response:			

Thomas DMcG

First Level _____ **Date** 8/21/13

TestAmerica Richland
QAS_RADCALCv4.8.44

Page 1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 3221032

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: CRDL = 1.0 pCi/g

Second Level Review: [signature] Date: 8/21/13

LS-038B, Rev. 10, 9/07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/21/2013 12:56:08 PM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3221031; RGAMMA Gamma by GER
SDG, Matrix: J01902; SOIL

1.0 COC

	Yes	No	N/A
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	✓		

2.0 QC Batch

	Yes	No	N/A
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2.2 Are the QC appropriate for the analysis included in the batch?	✓		
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	✓		
2.4 Does the Worksheets include a Tracer Vial label for each sample?			✓

3.0 QC & Samples

	Yes	No	N/A
3.1 Is the blank results, yield, and MDA within contract limits?	✓		
3.2 Is the LCS result, yield, and MDA within contract limits?	✓		
3.3 Are the MS/MSD results, yields, and MDA within contract limits?			✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?		✓	
3.5 Are the sample yields and MDAs within contract limits?		✓	

4.0 Raw Data

	Yes	No	N/A
4.1 Were results calculated in the correct units?	✓		
4.2 Were analysis volumes entered correctly?	✓		
4.3 Were Yields entered correctly?			✓
4.4 Were spectra reviewed/meet contractual requirements?	✓		
4.5 Were raw counts reviewed for anomalies?	✓		

5.0 Other

	Yes	No	N/A
5.1 Are all nonconformances included and noted?	✓		
5.2 Are all required forms filled out?	✓		
5.3 Was the correct methodology used?	✓		
5.4 Was transcription checked?	✓		
5.5 Were all calculations checked at a minimum frequency?			✓
5.6 Are worksheet entries complete and correct?	✓		

6.0 Comments on any No response:
NCM 10-24361

First Level Lisa Anderson **Date** 8/21/13

TestAmerica Richland
QAS_RADCALCv4.8.44

Page 1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 3221031

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓	✓	
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: CRDL = 0.1 pCi/g
See NCM #: 10-243601

Second Level Review: [signature] Date: 8/21/13

LS-038B, Rev. 10, 9/07

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: **10-24361**
NCM Initiated By: Lisa Antonson
Date Opened: 08/21/2013
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Counting
Tests: Gamma by GER
Lot #'s (Sample #'s): J3H080461 (1), J3H090000 (31),
QC Batches: 3221031,

Nonconformance: MDA not met
Subcategory: Data accepted

Problem Description / Root Cause

Name	Date	Description
Lisa Antonson	08/21/2013	MDA exceeds CRDL for the following: M1K8C1AG Eu-154 and Eu-155. M1K8C1AJ Eu-152, Eu-154 and Eu-155

Corrective Action

Name	Date	Corrective Action
Lisa Antonson	08/21/2013	None

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

Date Printed: 8/21/2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/26/2013 9:53:00 AM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3235077; RTRITIUM H-3 by LSC
SDG, Matrix: J01902; SOIL

1.0 COC	
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓ No N/A
2.0 QC Batch	
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓ No N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓ No N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓ No N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes No N/A ✓
3.0 QC & Samples	
3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓ No N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓ No N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes No N/A ✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes ✓ No N/A
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓ No N/A
4.0 Raw Data	
4.1 Were results calculated in the correct units?	Yes ✓ No N/A
4.2 Were analysis volumes entered correctly?	Yes ✓ No N/A
4.3 Were Yields entered correctly?	Yes No N/A ✓
4.4 Were spectra reviewed/meet contractual requirements?	Yes No N/A ✓
4.5 Were raw counts reviewed for anomalies?	Yes ✓ No N/A
5.0 Other	
5.1 Are all nonconformances included and noted?	Yes ✓ No N/A
5.2 Are all required forms filled out?	Yes ✓ No N/A
5.3 Was the correct methodology used?	Yes ✓ No N/A
5.4 Was transcription checked?	Yes ✓ No N/A
5.5 Were all calculations checked at a minimum frequency?	Yes No N/A ✓
5.6 Are worksheet entries complete and correct?	Yes ✓ No N/A

6.0 Comments on any No response:
NCM 10-24408

Thomas D McEl

First Level _____ **Date** 8/26/13

TestAmerica Richland
QAS_RADCALCv4.8.44

Page 1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

Batch Number: 323507

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓	✓	
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: SRDL=400pCi/g
See NCM #: 10-24408

Second Level Review: Rhonda [illegible] Date: 8/26/13

LS-038B, Rev. 10, 9/07

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: **10-24408**
NCM Initiated By: Tom Mcginnis
Date Opened: 08/26/2013
Date Closed:

Classification: **Deficiency**
Status: **PMREVIEW**
Production Area: Environmental - Sep
Tests: H-3 by LSC
Lot #'s (Sample #'s): J3H080461 (1), J3H090000 (35), J3H230000 (77),
QC Batches: 3235077,

Nonconformance: Batch Result Out of Limits
Subcategory: LCS result outside acceptance limits

Problem Description / Root Cause

Name	Date	Description
Tom Mcginnis	08/26/2013	Batch 3235077 is the recount of batch 3221035. The technician failed to properly prepare the LCS in the original batch. Since there was insufficient sample to perform a reanalysis, with client approval, a new LCS was prepared recounted with the original batch. All final results are comparable and the LCS meets acceptance criteria.

Corrective Action

Name	Date	Corrective Action
Tom Mcginnis	08/26/2013	The PM was notified of the batch deficienicies.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

Date Printed: 8/26/2013

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/23/2013 9:34:27 AM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3221034; RC14LSCC C-14 Digestion
SDG, Matrix: J01902; SOIL

1.0 COC	
1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yes ✓ No N/A
2.0 QC Batch	
2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yes ✓ No N/A
2.2 Are the QC appropriate for the analysis included in the batch?	Yes ✓ No N/A
2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes ✓ No N/A
2.4 Does the Worksheets include a Tracer Vial label for each sample?	Yes No N/A ✓
3.0 QC & Samples	
3.1 Is the blank results, yield, and MDA within contract limits?	Yes ✓ No N/A
3.2 Is the LCS result, yield, and MDA within contract limits?	Yes ✓ No N/A
3.3 Are the MS/MSD results, yields, and MDA within contract limits?	Yes No N/A ✓
3.4 Are the duplicate result, yields, and MDAs within contract limits?	Yes ✓ No N/A
3.5 Are the sample yields and MDAs within contract limits?	Yes ✓ No N/A
4.0 Raw Data	
4.1 Were results calculated in the correct units?	Yes ✓ No N/A
4.2 Were analysis volumes entered correctly?	Yes ✓ No N/A
4.3 Were Yields entered correctly?	Yes No N/A ✓
4.4 Were spectra reviewed/meet contractual requirements?	Yes No N/A ✓
4.5 Were raw counts reviewed for anomalies?	Yes ✓ No N/A
5.0 Other	
5.1 Are all nonconformances included and noted?	Yes No N/A ✓
5.2 Are all required forms filled out?	Yes ✓ No N/A
5.3 Was the correct methodology used?	Yes ✓ No N/A
5.4 Was transcription checked?	Yes ✓ No N/A
5.5 Were all calculations checked at a minimum frequency?	Yes No N/A ✓
5.6 Are worksheet entries complete and correct?	Yes ✓ No N/A
6.0 Comments on any No response:	

First Level [signature] **Date** 8/23/13

TestAmerica Richland
QAS_RADCALCv4.8.44

Page 1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist

RADIOCHEMISTRY

Second Level Review

Batch Number: JJQ 1034

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: SRDL = 50 pCi/g

Second Level Review: [signature] Date: 8/23/12

LS-038B, Rev. 10, 9/07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Data Review/Verification Checklist

RADIOCHEMISTRY, First Level Review

8/22/2013 11:46:42 AM

Lot No., Due Date: J3H080461; 08/23/2013
Client, Site: 127642; S00X235B00 HANFORD
QC Batch No., Method Test: 3221036; RNI63 Ni-63 by LSC
SDG, Matrix: J01902; SOIL

1.0 COC

1.1 Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions? Yes ✓ No N/A

2.0 QC Batch

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? Yes ✓ No N/A

2.2 Are the QC appropriate for the analysis included in the batch? Yes ✓ No N/A

2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc? Yes ✓ No N/A

2.4 Does the Worksheets include a Tracer Vial label for each sample? Yes ✓ No N/A

3.0 QC & Samples

3.1 Is the blank results, yield, and MDA within contract limits? Yes ✓ No N/A

3.2 Is the LCS result, yield, and MDA within contract limits? Yes ✓ No N/A

3.3 Are the MS/MSD results, yields, and MDA within contract limits? Yes No N/A ✓

3.4 Are the duplicate result, yields, and MDAs within contract limits? Yes ✓ No N/A

3.5 Are the sample yields and MDAs within contract limits? Yes ✓ No N/A

4.0 Raw Data

4.1 Were results calculated in the correct units? Yes ✓ No N/A

4.2 Were analysis volumes entered correctly? Yes ✓ No N/A

4.3 Were Yields entered correctly? Yes ✓ No N/A

4.4 Were spectra reviewed/meet contractual requirements? Yes No N/A ✓

4.5 Were raw counts reviewed for anomalies? Yes ✓ No N/A

5.0 Other

5.1 Are all nonconformances included and noted? Yes No N/A ✓

5.2 Are all required forms filled out? Yes ✓ No N/A

5.3 Was the correct methodology used? Yes ✓ No N/A

5.4 Was transcription checked? Yes ✓ No N/A

5.5 Were all calculations checked at a minimum frequency? Yes No N/A ✓

5.6 Are worksheet entries complete and correct? Yes ✓ No N/A

6.0 Comments on any No response:

First Level Lisa Anderson Date 8/22/13

TestAmerica Richland
QAS_RADCALCv4.8.44

Page 1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Data Review Checklist

RADIOCHEMISTRY

Second Level Review

Batch Number: 3221036

Review Item	Yes (√)	No (√)	NA (√)
A. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples 1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery within contract acceptance criteria?	✓		
6. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
7. Do the MS/MSD results and yields meet acceptance criteria?			✓
8. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other 1. Are all Non-conformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: CRDL = 30pci/g

Second Level Review: [signature] Date: 8/22/13

LS-038B, Rev. 10, 9/07

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Richland Laboratory
Data Review Check List
Hexavalent Chromium

Batch Number(s):	3225034	Lab Sample Numbers or SDG:	J01902

Method/Test/Parameter: Cr+6 ☐ RL-WC-003(Aqueous) ☒ RL-WC-004(Solid)

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level Review (✓)
A. Initial Calibration 1. Performed at required frequency with required number of levels?	✓			✓
2. Correlation coefficient greater than 0.97?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within 10% of expected?	✓			✓
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration 1. CCV analyzed at required frequency and all parameters within 10% of expected?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis 1. Were any samples with concentrations above the linear range diluted and reanalyzed?			✓	✓
2. Were all sample holding times met?	✓			✓
D. QC Samples 1. All results for the preparation blank below limits?	✓			✓
2. LCS percent recovery within 85-115%	✓			✓
3. $PbCrO_4$ percent recovery within 75-125%?	✓			✓
4. Sample and Duplicate within 20% (aqueous) or 35% (solid) RPD?		✓		✓
5. MS or MS/MSD recoveries within 85-115% (aqueous) or 75-125% (solid)?		✓		✓
6. On MS failure, PDMS within 85-115%?		✓		✓
E. Other 1. Are all nonconformances included and noted?	✓			✓
2. Is the correct date and time of analysis shown?	✓			✓
3. Did the analyst sign and date the front page of the analytical run?	✓			✓
4. Correct methodology used?	✓			✓
5. Transcriptions checked?	✓			✓
6. Calculations checked at minimum frequency?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response or list NCM number: 10-24377

Analyst H. Rahani Date 8/22/13 2nd Review [signature] Date 8/22/13

CG-231 Rev 1 5/12

Clouseau
Nonconformance Memo

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

NCM #: **10-24377**
NCM Initiated By: Hooshang Rahavi
Date Opened: 08/22/2013
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Classical Chemistry
Tests: 7196A
Lot #'s (Sample #'s): J3H080461 (1), J3H130000 (34),
QC Batches: 3225034,

Nonconformance: QC data exceeded criteria
Subcategory: MS/MSD accuracy and/or precision out of control

Problem Description / Root Cause

Name	Date	Description
Hooshang Rahavi	08/22/2013	The MS recovered low at 70.7%. The insoluble MS recovered within limits at 83.5%. PDMS recovered low at 71.9%. Duplicate not within acceptance criteria.

Corrective Action

Name	Date	Corrective Action
Hooshang Rahavi	08/22/2013	Suspect reducing capacity due to matrix effect. The LCS passed within limits at 95.6%; reported data as is.

Client Notification Summary

Client	Project Manager	Notified	Response	How Notified	Note	Response	Response Note

Quality Assurance Verification

Verified By	Due Date	Status	Notes
		This section not yet completed by QA.	

Approval History

Date Approved	Approved By	Position

HR

Date Printed: 8/22/2013

Pg. 1 of 2
~~Page 1 of 2~~
AJ 8-8-13

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-008

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K Riparian sample area (focused only)		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: TestAmerica - Richland	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Price Code: 8C

Data Turnaround: AJ 8-7-13 — 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

J3H080461 J3H080461

J01902
Due 8.23-13

SAMPLE ANALYSIS

Preservation				Cool 4C	None	None	None						
Type of Container				G/P	G/P	G/P	G/P						
No. of Container(s)				1	1	1	1						
Volume				250mL	500mL	250mL	250mL						
				Chromium Hex - 7196 {Hexavalent Chromium}	* * See item (2) in Special Instructions	Isotopic Plutonium; Nickel-63; Strontium-89,90 – Total Sr	Carbon-14; Tritium - H3			RCF			
Sample No.	Matrix	Sample Date	Sample Time										
J1RR98	SOIL	8-6-13	0946	X	X	X	X	R-5	4	35951			
M1K8C	SOIL												
	SOIL												
	SOIL												
	SOIL												

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White [signature]	8-6-13 1007	Doug Bowers / Doug Bowers	8-6-13/1007
Doug Bowers / Doug Bowers	8-6-13/1620	1060 Battelle Blvd Ref 2A	8-6-13/1620 *
1060 Battelle Blvd Ref 2A	8.7.13 0747	A. Freier A. Freier AJ 8.8.13	8.7.13 ~~8-8-13~~ ~~8-17-13~~ 0747 *
A. Freier A. Freier	8.7.13 1500	1060 Battelle	8.7.13 1500 Ref 2A
1060 Battelle Blvd Ref 2A	8.8.13 0832	A. Freier A. Freier	8.8.13 0832
A. Freier A. Freier WCH	8.8.13 1354	J. Bockbock TALR	8-8-13 1354

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

SPECIAL INSTRUCTIONS

(2) Gamma Spec (Client List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab

* * Samples from RCF pg. 2 of this COC. AJ 8.8.13

REVIEWED BY DWShea DATE 8/8/13

WCH-EE-011

Generated Date/Time: 06/27/2013 13:31, PDT

Washington Closure Hanford — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-238-008 | Page 2 of 2

Collector: WHITE, EC	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8C	Data Turnaround: 15 Days		
Project Designation: 100K Shoreline Characterization	Sampling Location: 100-K Riparian sample area (focused only)		SAF No.: RC-238
Ice Chest No.: NA	Field Logbook No.: EL-1668	COA: 0ESKSH6520	Method of Shipment: Local Delivery
Shipped To: Radiological Counting Facility	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

NA

Special Handling and/or Storage

J3H050461

J01902
Due 8-23-13

SAMPLE ANALYSIS

Preservation	None													
Type of Container	G/P													
No. of Container(s)	1													
Volume	AJ 8-7-13 ~~60g~~ 500ml													
	** RCF GEA Shipping Screen													
Sample No.	Matrix	Sample Date	Sample Time											
J1RR98	SOIL	8-6-13	0946	X		R-5	U	35951	413g					
MIKSC	SOIL													
	SOIL													
	SOIL													
	SOIL													

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
E. White	8-6-13 1007	Doug Bowers	8-6-13/1007
Doug Bowers	8-6-13/1620	1060 Battelle Blvd RCF2A	8-6-13/1620 *
1060 Battelle Blvd RCF2A	8-7-13 0747	A. Freier	8-7-13 0747 *
A. Freier (TW)	8-7-13 1015	D. Miller (RCF)	8-7-13 1015 **
(RCF)	8-8-13 0855	A. Freier	8-8-13 0855
A. Freier (WCH)	8-8-13 1354	(TAL)	8-8-13 1354

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

SPECIAL INSTRUCTIONS

* Custodian unavailable to remove samples from controlled storage. Shipper removed samples, taking custody for shipment to lab.

** RCF Samples (500ml) submitted to TALR for GEA on pg. 1 of this COC.
AJ 8-8-13

REVIEWED BY Mwshea DATE 8/8/13

Analysis Report for RCF35951

J1RR98 SAF-RC-238 100K/100-K-111 Riparian Sample Area

GAMMA SPECTRUM ANALYSIS

Sample Identification	: RCF35951
Sample Description	: J1RR98 SAF-RC-238 100K/100-K-111 Riparian Sample Area
Sample Type	: Non Standard Geometry
Sample Size	: 4.130E+02 grams
Facility	: Default
Sample Taken On	: 8/6/2013 9:46:00AM
Acquisition Started	: 8/7/2013 1:12:34PM
Procedure	: Non Standard Geometry
Operator	: RCT
Detector Name	: NEWBEGE
Geometry	: 50 ml Pill Box
Live Time	: 3600.0 seconds
Real Time	: 3600.9 seconds
Dead Time	: 0.02 %
Peak Locate Threshold	: 3.00
Peak Locate Range (in channels)	: 40 - 4096
Peak Area Range (in channels)	: 40 - 4096
Identification Energy Tolerance	: 1.000 keV
Energy Calibration Used Done On	: 6/24/2013
Efficiency Calibration Used Done On	: 2/22/2013
Efficiency Calibration Description	: NBEGE 50ml PB EC022213 SN92492
Sample Number	: 34079

"Qualitative Only"

INTERFERENCE CORRECTED REPORT

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
K-40		0.992	3.99E+00	4.57E-01	
PB-212		0.709	3.08E-01	2.63E-02	
RA-226d	@	0.777	2.52E-01	2.33E-02	
TH-232d		0.998	2.79E-01	2.35E-02	
U-235		0.541	3.81E-02	1.65E-02	

Analysis Report for RCF35951

J1RR98 SAF-RC-238 100K/100-K-111 Riparian Sample Area

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/grams)	Wt mean Activity Uncertainty	Comments
U-238d	@	1.000	3.46E-01	1.55E-01	

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/7/2013 2:12:55PM
Peak Locate From Channel : 40
Peak Locate To Channel : 4096

Peak No.	Energy (keV)	Peak Size (CPS)	Peak CPS (%) Uncertainty	Peak Type	Tolerance Nuclide
10	510.65	2.11142E-02	28.53		Th-232(d)
13	768.39	3.88889E-03	60.62	Sum	Ra-226(d)

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet
Errors quoted at 2.000 sigma

NUCLIDE MDA REPORT

Nuclide Library Used : \\WC98582\ApexRoot\Default\Library\RCF UNKNOWN.NLB

	Nuclide Name	Energy (keV)		Yield(%)	Activity (pCi/grams)	Nuclide MDA (pCi/grams)	Line MDA (pCi/grams)
+	K-40	1460.83	*	10.67	3.99E+00	3.37E-01	3.37E-01
	CO-60	1173.24		99.90	1.16E-04	3.09E-02	3.50E-02
		1332.50		99.98	1.66E-03		3.09E-02
	NB-94	702.63		99.81	1.03E-02	2.48E-02	2.63E-02
		871.10		99.89	-8.51E-03		2.48E-02
	AG-108m	433.94		90.50	7.73E-03	1.74E-02	1.74E-02
		614.28		89.80	-5.68E-04		3.11E-02
		722.94		90.80	-2.21E-02		3.04E-02
	CS-137	661.66		85.21	1.55E-02	2.85E-02	2.85E-02
	EU-152	40.12		38.40	-1.74E-03	1.42E-02	1.42E-02
		45.38		11.10	1.12E-02		6.78E-02
		121.78		28.40	-4.84E-03		2.86E-02

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Check-in List

Date/Time Received: 8-8-13 / 1354 Container GM Screen Result: (Airlock) 80 cpm Initials [JB]
Sample GM Screen Result (Sample Receiving) 40 cpm Initials [JB]

Client: WCH SDG #: J01902 SAF #: RC-238 NA [ ]

Lot Number: J3H080461

Chain of Custody # RC-238-008

Shipping Container ID or Air Bill Number : hand delivered NA [ ]

Samples received inside shipping container/cooler/box Yes [JB] Continue with 1 through 4. Initial appropriate response.
No [ ] Go to 5, add comment to #16.

1. Custody Seals on shipping container intact? Yes [ ] No [ ] No Custody Seal [JB]
2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [JB]
3. Cooler temperature: 5.3 °C On Ice NA [ ]
4. Vermiculite/packing materials is NA [ ] Wet [ ] Dry [ ]

Item 5 through 16 for samples. Initial appropriate response.

5. Chain of Custody record present? Yes [JB] No [ ]
6. Number of samples received (Each sample may contain multiple bottles): ~~3~~ 1 JB 8-9-13
7. Containers received: ~~3~~ 1 x 500 mL AG; ~~9~~ 3 x 250 mL AG
8. Sample holding times exceeded? NA [ ] Yes [ ] No [JB]
9. Samples have: ____ tape ____ hazard labels [JB] custody seals [JB] appropriate sample labels
10. Matrix: [JB] A (FLT, Wipe, Solid, Soil) ____ I (Water) ____ S (Air, Niosh 7400) ____ T (Biological, Ni-63)
11. Samples:
    [JB] are in good condition ____ are leaking ____ are broken
    ____ have air bubbles (Only for samples requiring no head space) ____ Other ____
12. Sample pH appropriate for analysis requested Yes [ ] No [ ] NA [JB]
    (If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO_3 added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [ ] No [JB]
14. Description of anomalies (include sample numbers): NA [JB]
15. Sample Location, Sample Collector Listed on COC? * Yes [JB] No [ ]
    *For documentation only. No corrective action needed.
16. Additional Information: N/A

[ ] Client/Courier denied temperature check. [ ] Client/Courier unpack cooler.

Sample Check-in List completed by Sample Custodian:
Signature: [signature] Date: 8.8.13

Client Notification needed? Yes [ ] No [ ] Date: ____
By: ____
Person contacted: ____

[X] No action necessary; process as is

Project Manager [signature] Date 8/9/13

LS-023 Rev. 17, 05/13

BHI

8/12/2013 1:42:43 PM

Sample Preparation/Analysis

Balance Id:1120373922

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

6A Pu Prp PRP003/PRP005, Sep ALP002(ALP015)
SO Plutonium-238,239/40 by Alpha Spec
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3221037 SOIL pCi/g
SEQ Batch, Test: None

PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

Prep Tech: SannohS

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M1K8C-1-AE J3H080461-1-SAMP 08/06/2013 09:46			1.03g,in	1.03g	PUTC13648 07/18/13,pd 01/01/10,r AmtRec: 1X500MLAG;3X250MLAG #Containers: 4				100 min Scr:	37 Alpha:	1235 Beta:	8/19/13	
2 M1K8C-1-AP-X J3H080461-1-DUP 08/06/2013 09:46			1.00g,in	1.00g	PUTC13649 07/18/13,pd 01/01/10,r AmtRec: 1X500MLAG;3X250MLAG #Containers: 4				Scr:	39 Alpha:	1236 Beta:		
3 M1LAQ-1-AA-B J3H090000-37-BLK 08/09/2013 10:09 pd			1.03g,in	1.03g	PUTC13650 07/18/13,pd 01/01/10,r AmtRec: #Containers: 1				Scr:	40 Alpha:	1237 Beta:		
4 M1LAQ-1-AC-C J3H090000-37-LCS 08/09/2013 10:09 pd			1.04g,in	1.04g	PUSK1018 08/12/13,pd 01/01/10,r AmtRec: #Containers: 1				Scr:	41 Alpha:	1237 Beta:		

8/12/2013 1:42:44 PM

Sample Preparation/Analysis

6A Pu Prp PRP003/PRP005, Sep ALP002(ALP015)
SO Plutonium-238,239/40 by Alpha Spec
5I CLIENT: HANFORD

Balance Id:1120373922

Pipet #: _____

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: SannohS

AnalyDueDate: 08/23/2013

Batch: 3221037 pCi/g
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments: M1LAQ-BLK CommentsP-13-00313,P-13-00353,S-13-00041

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AE-SAMP Constituent List:

PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						

M1LAQ1AA-BLK:

PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:	UCL:	RPD:
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						

M1LAQ1AC-LCS:

PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35

M1K8C1AE-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M1LAQ1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M1LAQ1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

8/22/2013 8:21:10 AM

ICOC Fraction Transfer/Status Report

ByDate: 8/22/2012, 8/27/2013, Batch: '3221037', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3221037						
AC		**Rev1C**	**SannohS**	8/12/2013 1:37:36 PM		
SC			rogersa	IsBatched	8/9/2013 10:10:57 AM	ICOC_RADCALC v4.8.49
SC			SannohS	InPrep	8/12/2013 1:37:36 PM	RL-PRP-003 REVISION 4
SC			SannohS	Prep1C	8/14/2013 10:19:07 AM	RL-PRP-003 REVISION 4
SC			JorgensonD	Sep1C	8/14/2013 5:34:59 PM	RL-ALP-001 REVISION 3
SC			RichardsonB	Sep2C	8/19/2013 10:30:11 AM	RL-ALP-016 REVISION 3
SC			NortonJ	CalcC	8/19/2013 2:49:46 PM	RL-CI-008 REVISION 3
SC			antonsonl	Rev1C	8/22/2013 8:21:03 AM	RL-DR-001 Rev 2
AC			**SannohS**	8/14/2013 10:19:07		
AC			**JorgensonD**	8/14/2013 5:34:59 PM		
AC			**RichardsonB**	8/19/2013 10:30:11		
AC			**NortonJ**	8/19/2013 2:49:46 PM		
AC			**antonsonl**	8/22/2013 8:21:03		

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 6

ICOCFractions v4.8.44

8/20/2013 9:16:49 PM

Sample Preparation/Analysis

Balance Id:1120373922

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

CH Sr-Total Prp PRP003, Sep ~~GPC003~~
~~TH~~ Total Strontium by GPC GPC010
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech: 1930 8/19/13 APA

Batch: 3221032 SOIL pCi/g
SEQ Batch, Test: None

PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

Prep Tech: SannohS

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M1K8C-1-AC J3H080461-1-SAMP 08/06/2013 09:46			3.02g,in	3.02g	SRTC1189 07/18/13 AmtRec: 1X500MLAG;3X250MLAG #Containers: 4		1.5"	10.6mg	50 Scr:	31A Alpha:	806	8/21/13 JB Beta:	
2 M1K8C-1-AK-X J3H080461-1-DUP 08/06/2013 09:46			3.03g,in	3.03g	SRTC1190 07/18/13 AmtRec: 1X500MLAG;3X250MLAG #Containers: 4			10.6mg	31B Scr:	Alpha:		Beta:	
3 M1LAJ-1-AA-B J3H090000-32-BLK 08/09/2013 10:09 pd			3.01g,in	3.01g	SRTC1191 07/18/13 AmtRec: #Containers: 1			8.3mg	31D Scr:	Alpha:		Beta:	
4 M1LAJ-1-AC-C J3H090000-32-LCS 08/09/2013 10:09 pd			3.02g,in	3.02g	STSF0291 07/29/13 AmtRec: #Containers: 1			8.5mg	32A Scr:	Alpha:		Beta:	

8/20/2013 9:16:49 PM

Sample Preparation/Analysis

CH Sr-Total Prp PRP003, Sep GPC003
TH Total Strontium by GPC
5I CLIENT: HANFORD

Balance Id:1120373922
Pipet #: _____
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech: SannohS

AnalyDueDate: 08/23/2013

Batch: 3221032 pCi/g
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments: M1LAJ-BLK CommentsP-13-00313,P-13-00353,S-13-00041

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AC-SAMP Constituent List:
Sr-90 RDL:1 pCi/g LCL:70 UCL:130 RPD:35
M1LAJ1AA-BLK:
Sr-90 RDL:1 pCi/g LCL: UCL: RPD:
M1LAJ1AC-LCS:
Sr-90 RDL:1 pCi/g LCL:70 UCL:130 RPD:35

M1K8C1AC-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LAJ1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LAJ1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

8/21/2013 12:31:46 PM

ICOC Fraction Transfer/Status Report

ByDate: 8/21/2012, 8/26/2013, Batch: '3221032', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3221032						
AC		**Rev1C**	**SannohS**	8/12/2013 1:12:19 PM		
SC			rogersa	IsBatched	8/9/2013 10:10:57 AM	ICOC_RADCALC v4.8.49
SC			SannohS	InPrep	8/12/2013 1:12:19 PM	RL-PRP-003 REVISION 4
SC			SannohS	Prep1C	8/14/2013 10:19:27 AM	RL-PRP-003 REVISION 4
SC			DawkinsO	InCnt1	8/20/2013 9:37:54 PM	RL-CI-006 REVISION 4
SC			CarnesH	CalcC	8/21/2013 9:27:06 AM	RL-CI-006 REVISION 4
SC			mcginnist	Rev1C	8/21/2013 12:31:34 PM	RL-DR-001 Rev 2
AC			**SannohS**	8/14/2013 10:19:27		
AC			**DawkinsO**	8/20/2013 9:37:54 PM		
AC			**CarnesH**	8/21/2013 9:27:06		
AC			**mcginnist**	8/21/2013 12:31:34		

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 5

ICOCFractions v4.8.44

8/12/2013 3:25:22 PM

Sample Preparation/Analysis

Balance Id:1120421763

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

AX Gamma Prp PRP003/GAM001
TA Gamma by HPGE
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3221031 SOIL pCi/g
SEQ Batch, Test: None

PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

Prep Tech: SannohS

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M1K8C-1-AG J3H080461-1-SAMP 08/06/2013 09:46			291.50g,in	291.50g AmtRec: 1X500MLAG;3X250MLAG #Containers: 4				S200	200min	G11	16:51	8-17-13	Scr: Alpha: Beta:
2 M1K8C-1-AJ-X J3H080461-1-DUP 08/06/2013 09:46			278.00g,in	278.00g AmtRec: 1X500MLAG;3X250MLAG #Containers: 4						G7	20:39	8-17-13	Scr: Alpha: Beta:
3 M1LAG-1-AA-B J3H090000-31-BLK 08/09/2013 10:09 pd			348.00g,in	348.00g AmtRec: #Containers: 1						G10			Scr: Alpha: Beta:
4 M1LAG-1-AC-C J3H090000-31-LCS 08/09/2013 10:09 pd			350.10g,in	350.10g AmtRec: #Containers: 1	QC20009 08/04/09,pd 09/01/09,r					G11			Scr: Alpha: Beta:

8/12/2013 3:25:23 PM

Sample Preparation/Analysis

AX Gamma Prp PRP003/GAM001
TA Gamma by HPGE
5I CLIENT: HANFORD

Balance Id:1120421763

Pipet #: _____

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: ,SannohS

AnalyDueDate: 08/23/2013

Batch: 3221031 pCi/g
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments:

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AG-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:70	UCL:130	RPD:35
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:70	UCL:130	RPD:35	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
K-40	RDL:	pCi/g	LCL:	UCL:	RPD:						

M1LAG1AA-BLK:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
K-40	RDL:	pCi/g	LCL:	UCL:	RPD:						

M1LAG1AC-LCS:

Cs-137	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	Cs-137DA	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35
K-40	RDL:--	pCi/g	LCL:70	UCL:130	RPD:35	Ra-226	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35
RA-228	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35	RA-228DA	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35
U-238	RDL:	pCi/g	LCL:70	UCL:130	RPD:35						

M1K8C1AG-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M1LAG1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

M1LAG1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

8/21/2013 12:52:36 PM

ICOC Fraction Transfer/Status Report

ByDate: 8/21/2012, 8/26/2013, Batch: '3221031', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3221031						
AC		**Rev1C**	**SannohS**	8/9/2013 11:35:06		
SC			rogersa	IsBatched	8/9/2013 10:10:57 AM	ICOC_RADCALC v4.8.49
SC			SannohS	InPrep	8/9/2013 11:35:06 AM	RL-GAM-001 REVISION 2
SC			SannohS	Prep1C	8/12/2013 3:30:06 PM	RL-GAM-001 REVISION 2
SC			DawkinsO	InCnt1	8/12/2013 10:21:58 PM	RL-CI-007 REVISION 3
SC			NortonJ	CalcC	8/18/2013 7:45:48 AM	RL-CI-007 REVISION 3
SC			antonsonl	Rev1C	8/21/2013 12:52:13 PM	RL-DR-001 Rev 2
AC			**SannohS**	8/12/2013 3:30:06 PM		
AC			**DawkinsO**	8/12/2013 10:21:58		
AC			**NortonJ**	8/18/2013 7:45:48		
AC			**antonsonl**	8/21/2013 12:52:13		

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 5

ICOCFractions v4.8.44

8/23/2013 4:05:25 PM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

AnalyDueDate: 08/23/2013

AT H-3 Prp/Sep LSC002
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

PRIORITY

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

Batch: 3235077 SOIL pCi/g PM, Quote: RW2, 27038
SEQ Batch, Test: None All Tests: 5STC, 6ASO, AFS4, ATS6, AXTA, CHTH, DWEA, 3221031 AXTA, 3221032 CHTH, 3221034 5STC, 3221035 ATS6, 3221036 AFS4, 3221037 6ASO, 3225034 DWEA, 3235077 ATS6,

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M1K8C-2-AF J3H080461-1-SAMP 08/06/2013 09:46	AmtRec: 1X500MLAG;3X250MLAG	#Containers: 4	Scr:	Alpha:	Beta:								
2 M1K8C-2-AM-X J3H080461-1-DUP 08/06/2013 09:46	AmtRec: 1X500MLAG;3X250MLAG	#Containers: 4	Scr:	Alpha:	Beta:								
3 M1LAM-2-AA-B J3H090000-35-BLK 08/23/2013 16:05 pd	AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:								
4 M1LAM-2-AD-BN J3H090000-35-IBLK 08/23/2013 16:05 pd	AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:								
5 M1P29-1-AA-C J3H230000-77-LCS 08/23/2013 16:05 pd	AmtRec:	#Containers: 1	Scr:	Alpha:	Beta:								

Comments: M1LAM-BLK "Comments, P-13-00605",S-12-00260,H312B140,S-13-00091

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

24408

M1K8C2AF-SAMP Constituent List:

TestAmerica Richland Wa. Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added

ISV - Insufficient Volume for Analysis

WO Cnt: 5
ICOC v4.8.49

8/23/2013 4:05:26 PM

Sample Preparation/Analysis

AT H-3 Prp/Sep LSC002
S6 Tritium by Liquid Scint
5I CLIENT: HANFORD

Balance Id:
Pipet #:
Sep1 DT/Tm Tech:
Sep2 DT/Tm Tech:
Prep Tech:

AnalyDueDate: 08/23/2013

Batch: 3235077 **pCi/g**
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

M1LAM2AA-BLK:

M1LAM2AD-IBLK:

M1P291AA-LCS:

M1K8C2AF-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LAM2AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LAM2AD-IBLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1P291AA-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

8/26/2013 9:49:25 AM

ICOC Fraction Transfer/Status Report

ByDate: 8/26/2012, 8/31/2013, Batch: '3235077', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3235077						
AC		**Rev1C**	**NortonP**	8/23/2013 4:16:46 PM		
SC			NortonP	Sep1C	8/23/2013 4:16:46 PM	RL-LSC-002 REVISION 4
SC			DawkinsO	InCnt1	8/23/2013 4:57:48 PM	RL-CI-005 REVISION 3
SC			NortonJ	CalcC	8/24/2013 1:15:26 PM	RL-CI-005 REVISION 3
SC			mcginnist	Rev1C	8/26/2013 9:49:16 AM	RL-DR-001 Rev 2
AC			**DawkinsO**	8/23/2013 4:57:48 PM		
AC			**NortonJ**	8/24/2013 1:15:26 PM		
AC			**mcginnist**	8/26/2013 9:49:16		

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 4

ICOCFractions v4.8.44

8/22/2013 9:10:39 AM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

5S C-14 Prp/Sep LSC008
TC C-14 by LSC, Carbosorb
01 STANDARD TEST SET

Balance Id:

Pipet #: _____

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3221034 SOIL pCi/g PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None All Tests: 5STC, 6ASO, AFS4, ATS6, AXTA, CHTH, DWEA, 3221031 AXTA, 3221032 CHTH, 3221034 5STC, 3221035 ATS6, 3221036 AFS4, 3221037 6ASO, 3225034 DWEA

Prep Tech: SannohS,WindischT

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 **M1K8C-1-AH** J3H080461-1-SAMP 08/06/2013 09:46			4.015g,in	4.015g	AmtRec: 1X500MLAG;3X250MLAG	#Containers: 4				Scr:	Alpha:	Beta:	
2 **M1K8C-1-AL-X** J3H080461-1-DUP 08/06/2013 09:46			4.043g,in	4.043g	AmtRec: 1X500MLAG;3X250MLAG	#Containers: 4				Scr:	Alpha:	Beta:	
3 **M1LAK-1-AA-B** J3H090000-34-BLK 08/09/2013 10:09 pd			4.042g,in	4.042g	AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:	
4 **M1LAK-1-AC-C** J3H090000-34-LCS 08/09/2013 10:09 pd			4.015g,in	4.015g	AmtRec:	#Containers: 1	CSB1309 08/19/13,pd 11/08/12,r			Scr:	Alpha:	Beta:	
5 **M1LAK-1-AD-BN** J3H090000-34-IBLK 08/22/2013 09:10 pd					AmtRec:	#Containers: 1				Scr:	Alpha:	Beta:	

Comments:

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AH-SAMP Constituent List:
C-14 RDL:5.00E+01 pCi/g LCL: UCL: RPD:

TestAmerica Richland Wa. Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added Page 1 ISV - Insufficient Volume for Analysis WO Cnt: 5 ICOC v4.8.49

8/22/2013 9:10:39 AM

Sample Preparation/Analysis

5S C-14 Prp/Sep LSC008
TC C-14 by LSC, Carbosorb
01 STANDARD TEST SET

Balance Id:

Pipet #:

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech:

AnalyDueDate: 08/23/2013

Batch: 3221034 pCi/g
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

```
M1LAK1AA-BLK:
  C-14        RDL:5.00E+01    pCi/g     LCL:        UCL:        RPD:
M1LAK1AC-LCS:

M1LAK1AD-IBLK:

M1K8C1AH-SAMP Calc Info:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
M1LAK1AA-BLK:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
M1LAK1AC-LCS:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
M1LAK1AD-IBLK:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
```

8/23/2013 9:33:53 AM

ICOC Fraction Transfer/Status Report

ByDate: 8/23/2012, 8/28/2013, Batch: '3221034', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting			Comments
3221034						
AC		**Rev1C**	**WindischT**	8/21/2013 9:17:21		
SC			rogersa	IsBatched	8/9/2013 10:10:57 AM	ICOC_RADCALC v4.8.49
SC			WindischT	Sep1C	8/21/2013 9:17:21 AM	RL-LSC-008 REVISION 3
SC			CarnesH	InCnt1	8/21/2013 9:19:28 AM	RL-CI-005 REVISION 3
SC			BullJ	CalcC	8/23/2013 9:24:09 AM	RL-CI-005 REVISION 3
SC			mcginnist	Rev1C	8/23/2013 9:33:25 AM	RL-DR-001 Rev 2
AC			**CarnesH**	8/21/2013 9:19:28		
AC			**BullJ**	8/23/2013 9:24:09		
AC			**mcginnist**	8/23/2013 9:33:25		

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 4

ICOCFractions v4.8.44

8/12/2013 1:32:39 PM

Sample Preparation/Analysis

Balance Id:1120373922

127642, Washington Closure Hanford LLC ,
Bechtel Hanford, Inc.

AF Ni-63 Prp PRP003/PRP005, Sep LSC017
S4 Nickel by ICP and Nickel-63 by Liquid Scint
5I CLIENT: HANFORD

Pipet #: _____

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3221036 SOIL pCi/g
SEQ Batch, Test: None

PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

Prep Tech: SannohS

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 **M1K8C-1-AD** J3H080461-1-SAMP			0.52g,in	0.52g	NITA10167 08/05/13				20min				
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
2 **M1K8C-1-AN-X** J3H080461-1-DUP			0.54g,in	0.54g	NITA10168 08/05/13								
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
3 **M1LAP-1-AA-B** J3H090000-36-BLK			0.50g,in	0.50g	NITA10169 08/05/13								
08/09/2013 10:09 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:
4 **M1LAP-1-AC-C** J3H090000-36-LCS			0.54g,in	0.54g	NISA1937 07/23/13								
08/09/2013 10:09 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:
5 **M1LAP-1-AD-BN** J3H090000-36-IBLK													
08/09/2013 10:09 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:

8/12/2013 1:32:40 PM

Sample Preparation/Analysis

AF Ni-63 Prp PRP003/PRP005, Sep LSC017
S4 Nickel by ICP and Nickel-63 by Liquid Scint
5I CLIENT: HANFORD

Balance Id:

Pipet #:

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech:

AnalyDueDate: 08/23/2013

Batch: 3221036 **pCi/g**
SEQ Batch, Test: None

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments: M1LAP-BLK CommentsP-13-00313,P-13-00353,S-13-00041

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AD-SAMP Constituent List:

Ni-63	RDL:30	pCi/g	LCL:70	UCL:130	RPD:35
M1LAP1AA-BLK:					
Ni-63	RDL:30	pCi/g	LCL:	UCL:	RPD:
M1LAP1AC-LCS:					
Ni-63	RDL:30	pCi/g	LCL:70	UCL:130	RPD:35
M1LAP1AD-IBLK:					
Ni-63	RDL:30	pCi/g	LCL:	UCL:	RPD:

M1K8C1AD-SAMP Calc Info:

Uncert Level (#s).: 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
M1LAP1AA-BLK:				
Uncert Level (#s).: 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
M1LAP1AC-LCS:				
Uncert Level (#s).: 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B
M1LAP1AD-IBLK:				
Uncert Level (#s).: 2	Decay to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B

8/22/2013 11:44:19 AM

ICOC Fraction Transfer/Status Report

ByDate: 8/22/2012, 8/27/2013, Batch: '3221036', User: *ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting				Comments
3221036							
AC		**Rev1C**	**SannohS**	8/12/2013 1:27:38 PM			
SC			rogersa	IsBatched	8/9/2013 10:10:57 AM		ICOC_RADCALC v4.8.49
SC			SannohS	InPrep	8/12/2013 1:27:38 PM		RL-PRP-003 REVISION 4
SC			SannohS	Prep1C	8/14/2013 10:20:16 AM		RL-PRP-003 REVISION 4
SC			BullJ	InCnt1	8/21/2013 10:09:37 AM		RL-CI-005 REVISION 3
SC			NortonJ	CalcC	8/22/2013 10:02:35 AM		RL-CI-005 REVISION 3
SC			antonsonl	Rev1C	8/22/2013 11:40:45 AM		RL-DR-001 Rev 2
AC			**SannohS**	8/14/2013 10:20:16			
AC			**BullJ**	8/21/2013 10:09:37			
AC			**NortonJ**	8/22/2013 10:02:35			
AC			**antonsonl**	8/22/2013 11:40:45			

AC: Accepting Entry; SC: Status Change

TestAmerica Richland

Richland Wa.

Page 1

Grp Rec Cnt: 5

ICOCFractions v4.8.44

8/19/2013 9:43:59 AM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC
Bechtel Hanford, Inc.

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:

Pipet #:

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3225034 SOIL mg/kg
SEQ Batch, Test: None

PM, Quote: RW2, 27038

Sep2 DT/Tm Tech:

Prep Tech:

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 M1K8C-1-AA													
J3H080461-1-SAMP													
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
2 M1K8C-1-AQ-S													
J3H080461-1-MS													
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
3 M1K8C-1-AR-D													
J3H080461-1-MSD													
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
4 M1K8C-1-AT-X													
J3H080461-1-DUP													
08/06/2013 09:46			AmtRec: 1X500MLAG;3X250MLAG		#Containers: 4				Scr:		Alpha:		Beta:
5 M1LXX-1-AA-B													
J3H130000-34-BLK													
08/19/2013 09:43 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:
6 M1LXX-1-AC-C													
J3H130000-34-LCS													
08/19/2013 09:43 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:

TestAmerica Richland Wa.

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1
pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added

ISV - Insufficient Volume for Analysis

WO Cnt: 6
ICOC v4.8.49

8/19/2013 9:43:59 AM

Sample Preparation/Analysis

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
5I CLIENT: HANFORD

Balance Id:

Pipet #:

AnalyDueDate: 08/23/2013

Sep1 DT/Tm Tech:

Batch: 3225034 mg/kg

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Ord, Lot, Sample Date	Total Amt/Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Tracer Yield	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On | Off (24hr) Circle	CR Analyst, Init/Date	Comments:

Comments:

All Clients for Batch:
127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27038

M1K8C1AA-SAMP Constituent List:
HEXCHROME RDL:.1548 mg/kg LCL:80 UCL:120 RPD:20
M1K8C1AQ-MS Constituent List:
HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20
M1K8C1AR-MSD:
HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20
M1LXX1AA-BLK:
HEXCHROME RDL:.1548 mg/kg LCL: UCL: RPD:
M1LXX1AC-LCS:
HEXCHROME RDL:0.35 mg/kg LCL:80 UCL:120 RPD:20

M1K8C1AA-SAMP Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1K8C1AQ-MS Calc Info:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1K8C1AR-MSD:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LXX1AA-BLK:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B
M1LXX1AC-LCS:
Uncert Level (#s).: 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

ANALYTICAL REPORT

Job Number: 280-45300-1

SDG Number: J01902

Job Description: SAF# RC-238

For:
Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

Attention: Joan H Kessner

Approved for release.
Kae E Yoder
Project Manager II
8/26/2013 9:44 AM

Kae E Yoder, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0190
kae.yoder@testamericainc.com
08/26/2013

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is E87667.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Table of Contents

Cover Title Page 1
Report Narrative 3
Data Qualifiers 4
Sample Summary 5
Method Summary 6
Method / Analyst Summary 7
Sample Results 8
Sample Datasheets 9
QC Results 11
Qc Reports 12
Qc Association Summary 19
Client Chain of Custody 20
Sample Receipt Checklist 21

CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-45300-1

SDG #: J01902
SAF#: RC-238

Date SDG Closed: August 9 2013
Data Deliverable: 15 Day / Summary

CLIENT ID	LAB ID	ANALYSES REQUESTED	ANALYSES PERFORMED
J1RR98	280-45300-1	6010/7471	6010B/7471A

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed in this Case Narrative. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the signature on the Report Cover.

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

The results, RLs and MDLs included in this report have been adjusted for dry weight, as appropriate.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The sample was received on 8/9/2013 9:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5º C.

TOTAL METALS - SW846 6010B/7471A
Serial dilution of a digestate in batch 280-186955 indicates that physical and chemical interferences are present for several elements. Results have been flagged with an "X".

It can be noted that the sample amount was greater than four times the spike amount for Aluminum, Chromium, Iron and Manganese in the Matrix Spike performed on sample J1RR98; therefore, control limits are not applicable.

The duplicate analysis of sample J1RR98 exhibited RPD data outside the control limits for Manganese, and the associated sample result has been flagged "M". There is no indication that the analytical system was operating out of control, and method accuracy has been verified by the acceptable LCS analysis data; therefore, corrective action is deemed unnecessary.

No other anomalies were encountered.

DATA REPORTING QUALIFIERS

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Lab Section	Qualifier	Description
Metals		
	U	Analyzed for but not detected.
	B	Estimated result. Result is less than the RL, but greater than MDL
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	M	Sample duplicate precision not met.
	X	Serial dilution in the analytical batch indicates that physical and chemical interferences are present.

SAMPLE SUMMARY

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-45300-1	J1RR98	Solid	08/06/2013 0946	08/09/2013 0900

METHOD SUMMARY

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Metals (ICP)	TAL DEN	SW846 6010B	
Preparation, Metals	TAL DEN		SW846 3050B
Mercury (CVAA)	TAL DEN	SW846 7471A	
Preparation, Mercury	TAL DEN		SW846 7471A
ASTM D-2216	TAL DEN	ASTM D-2216	

Lab References:

TAL DEN = TestAmerica Denver

Method References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Method	Analyst	Analyst ID
SW846 6010B	Harre, John K	JKH
SW846 7471A	Fredette, Nick M	NMF
ASTM D-2216	McKittrick, Ian B	IBM

SAMPLE RESULTS

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Client Sample ID: **J1RR98**

Lab Sample ID: 280-45300-1
Client Matrix: Solid
% Moisture: 6.0

Date Sampled: 08/06/2013 0946
Date Received: 08/09/2013 0900

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	280-187482	Instrument ID:	MT_025
Prep Method:	3050B	Prep Batch:	280-186955	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	08/15/2013 1619			Final Weight/Volume:	100 mL
Prep Date:	08/13/2013 0926				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10900	X	1.5	4.7
Antimony		0.36	U	0.36	0.57
Arsenic		19.4		0.63	0.95
Barium		137	X	0.072	0.47
Beryllium		0.39		0.031	0.19
Boron		1.2	B	0.93	1.9
Cadmium		0.64		0.039	0.19
Calcium		3340	X	13.4	47.5
Chromium		133	X	0.055	0.19
Cobalt		8.9	X	0.095	0.95
Copper		30.7		0.21	0.95
Iron		23700	X	3.6	4.7
Lead		16.2	X	0.26	0.47
Magnesium		3690	X	3.5	19.0
Manganese		623	X M	0.095	0.95
Molybdenum		1.3	B	0.25	1.9
Nickel		25.9	X	0.12	3.8
Potassium		1130		38.9	285
Selenium		0.82	U	0.82	0.95
Silicon		219		5.4	9.5
Silver		0.15	U	0.15	0.19
Sodium		133		56.0	114
Vanadium		56.8		0.089	1.9
Zinc		87.8	X	0.38	0.95

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	280-187309	Instrument ID:	MT_034
Prep Method:	7471A	Prep Batch:	280-187094	Lab File ID:	130814taa.txt
Dilution:	1.0			Initial Weight/Volume:	0.54 g
Analysis Date:	08/14/2013 1623			Final Weight/Volume:	50 mL
Prep Date:	08/14/2013 1115				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.023		0.0065	0.020

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

General Chemistry

Client Sample ID: **J1RR98**

Lab Sample ID: 280-45300-1
Client Matrix: Solid

Date Sampled: 08/06/2013 0946
Date Received: 08/09/2013 0900

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	6.0		%	0.10	0.10	1.0	D-2216

Analysis Batch: 280-186966 Analysis Date: 08/13/2013 0955 DryWt Corrected: N

QUALITY CONTROL RESULTS

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Method Blank - Batch: 280-186955

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 280-186955/1-A	Analysis Batch:	280-187482	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-186955	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	08/15/2013 1614	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/13/2013 0926				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	1.6	U	1.6	5.0
Antimony	0.38	U	0.38	0.60
Arsenic	0.66	U	0.66	1.0
Barium	0.076	U	0.076	0.50
Beryllium	0.033	U	0.033	0.20
Boron	0.98	U	0.98	2.0
Cadmium	0.041	U	0.041	0.20
Calcium	14.1	U	14.1	50.0
Chromium	0.058	U	0.058	0.20
Cobalt	0.10	U	0.10	1.0
Copper	0.22	U	0.22	1.0
Iron	3.8	U	3.8	5.0
Lead	0.27	U	0.27	0.50
Magnesium	3.7	U	3.7	20.0
Manganese	0.10	U	0.10	1.0
Molybdenum	0.26	U	0.26	2.0
Nickel	0.12	U	0.12	4.0
Potassium	41.0	U	41.0	300
Selenium	0.86	U	0.86	1.0
Silicon	5.7	U	5.7	10.0
Silver	0.16	U	0.16	0.20
Sodium	59.0	U	59.0	120
Vanadium	0.094	U	0.094	2.0
Zinc	0.40	U	0.40	1.0

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Lab Control Sample - Batch: 280-186955

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 280-186955/2-A	Analysis Batch:	280-187482	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-186955	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1 g
Analysis Date:	08/15/2013 1616	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/13/2013 0926				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	200	192.9	96	82 - 116	
Antimony	50.0	46.10	92	82 - 110	
Arsenic	100	99.68	100	85 - 110	
Barium	200	198.6	99	87 - 112	
Beryllium	5.00	4.94	99	84 - 114	
Boron	100	94.00	94	80 - 120	
Cadmium	10.0	10.43	104	87 - 110	
Calcium	5000	4930	99	82 - 114	
Chromium	20.0	19.89	99	84 - 114	
Cobalt	50.0	48.98	98	87 - 110	
Copper	25.0	24.97	100	88 - 110	
Iron	100	101.2	101	87 - 120	
Lead	50.0	49.48	99	86 - 110	
Magnesium	5000	4732	95	90 - 110	
Manganese	50.0	48.37	97	88 - 110	
Molybdenum	100	95.97	96	86 - 110	
Nickel	50.0	48.83	98	87 - 110	
Potassium	5000	5002	100	89 - 110	
Selenium	200	195.0	98	83 - 110	
Silicon	1000	134.4	13	10 - 70	
Silver	5.00	4.82	96	87 - 114	
Sodium	5000	4974	99	90 - 112	
Vanadium	50.0	49.75	99	88 - 110	
Zinc	50.0	47.76	96	76 - 114	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Matrix Spike - Batch: 280-186955

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-45300-1	Analysis Batch:	280-187482	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-186955	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.13 g
Analysis Date:	08/15/2013 1626	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/13/2013 0926				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	10900		188	14130	1729	50 - 200	4
Antimony	0.36	U	47.1	17.46	37	20 - 200	
Arsenic	19.4		94.1	100.9	87	76 - 111	
Barium	137		188	300.5	87	52 - 159	
Beryllium	0.39		4.71	4.41	85	72 - 105	
Boron	1.2	B	94.1	76.77	80	80 - 120	
Cadmium	0.64		9.41	9.23	91	40 - 130	
Calcium	3340		4710	8396	107	43 - 165	
Chromium	133		18.8	159.4	138	70 - 200	4
Cobalt	8.9		47.1	47.93	83	72 - 106	
Copper	30.7		23.5	53.29	96	37 - 187	
Iron	23700		94.1	25300	1744	70 - 200	4
Lead	16.2		47.1	55.51	84	70 - 200	
Magnesium	3690		4710	8189	96	64 - 145	
Manganese	623		47.1	514.8	-229	40 - 200	4
Molybdenum	1.3	B	94.1	78.32	82	75 - 103	
Nickel	25.9		47.1	66.19	86	61 - 126	
Potassium	1130		4710	5754	98	56 - 172	
Selenium	0.82	U	188	157.9	84	76 - 104	
Silicon	219		941	492.3	29	20 - 200	
Silver	0.15	U	4.71	3.97	84	75 - 141	
Sodium	133		4710	4467	92	78 - 111	
Vanadium	56.8		47.1	105.7	104	50 - 169	
Zinc	87.8		47.1	130.0	90	70 - 200	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Duplicate - Batch: 280-186955

Method: 6010B
Preparation: 3050B

Lab Sample ID:	280-45300-1	Analysis Batch:	280-187482	Instrument ID:	MT_025
Client Matrix:	Solid	Prep Batch:	280-186955	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	1.08 g
Analysis Date:	08/15/2013 1623	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	08/13/2013 0926				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Aluminum	10900		11790	8	40	
Antimony	0.36	U	0.37	NC	40	U
Arsenic	19.4		19.60	0.8	30	
Barium	137		113.6	19	30	
Beryllium	0.39		0.417	7	30	
Boron	1.2	B	1.11	4	30	B
Cadmium	0.64		0.662	4	30	
Calcium	3340		3466	4	30	
Chromium	133		144.7	8	40	
Cobalt	8.9		7.77	14	30	
Copper	30.7		33.48	9	30	
Iron	23700		25610	8	40	
Lead	16.2		16.93	5	40	
Magnesium	3690		3938	6	30	
Manganese	623		324.1	63	40	M
Molybdenum	1.3	B	1.22	5	30	B
Nickel	25.9		27.81	7	30	
Potassium	1130		1201	6	40	
Selenium	0.82	U	0.85	NC	30	U
Silicon	219		273.9	22	40	
Silver	0.15	U	0.16	NC	30	U
Sodium	133		131.3	2	30	
Vanadium	56.8		60.71	7	30	
Zinc	87.8		90.43	3	40	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Method Blank - Batch: 280-187094

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 280-187094/1-A	Analysis Batch:	280-187309	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-187094	Lab File ID:	130814taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	08/14/2013 1614	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/14/2013 1115				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	0.0055	U	0.0055	0.017

Lab Control Sample - Batch: 280-187094

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 280-187094/2-A	Analysis Batch:	280-187309	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-187094	Lab File ID:	130814taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.60 g
Analysis Date:	08/14/2013 1617	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/14/2013 1115				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.417	0.434	104	87 - 111	

Matrix Spike - Batch: 280-187094

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-45300-1	Analysis Batch:	280-187309	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-187094	Lab File ID:	130814taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.58 g
Analysis Date:	08/14/2013 1628	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/14/2013 1115				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.023	0.459	0.456	94	87 - 111	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Duplicate - Batch: 280-187094

Method: 7471A
Preparation: 7471A

Lab Sample ID:	280-45300-1	Analysis Batch:	280-187309	Instrument ID:	MT_034
Client Matrix:	Solid	Prep Batch:	280-187094	Lab File ID:	130814taa.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	0.59 g
Analysis Date:	08/14/2013 1626	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/14/2013 1115				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	0.023	0.0238	2	20	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

Duplicate - Batch: 280-186966

Method: D-2216
Preparation: N/A

Lab Sample ID:	280-45300-1	Analysis Batch:	280-186966	Instrument ID:	No Equipment Assigned
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	08/13/2013 0955	Units:	%	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	6.0	6.2	4	20	

Client: Washington Closure Hanford

Job Number: 280-45300-1
Sdg Number: J01902

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 280-186955					
LCS 280-186955/2-A	Lab Control Sample	T	Solid	3050B	
MB 280-186955/1-A	Method Blank	T	Solid	3050B	
280-45300-1	J1RR98	T	Solid	3050B	
280-45300-1DU	Duplicate	T	Solid	3050B	
280-45300-1MS	Matrix Spike	T	Solid	3050B	
Prep Batch: 280-187094					
LCS 280-187094/2-A	Lab Control Sample	T	Solid	7471A	
MB 280-187094/1-A	Method Blank	T	Solid	7471A	
280-45300-1	J1RR98	T	Solid	7471A	
280-45300-1DU	Duplicate	T	Solid	7471A	
280-45300-1MS	Matrix Spike	T	Solid	7471A	
Analysis Batch:280-187309					
LCS 280-187094/2-A	Lab Control Sample	T	Solid	7471A	280-187094
MB 280-187094/1-A	Method Blank	T	Solid	7471A	280-187094
280-45300-1	J1RR98	T	Solid	7471A	280-187094
280-45300-1DU	Duplicate	T	Solid	7471A	280-187094
280-45300-1MS	Matrix Spike	T	Solid	7471A	280-187094
Analysis Batch:280-187482					
LCS 280-186955/2-A	Lab Control Sample	T	Solid	6010B	280-186955
MB 280-186955/1-A	Method Blank	T	Solid	6010B	280-186955
280-45300-1	J1RR98	T	Solid	6010B	280-186955
280-45300-1DU	Duplicate	T	Solid	6010B	280-186955
280-45300-1MS	Matrix Spike	T	Solid	6010B	280-186955

Report Basis
T = Total

General Chemistry

Analysis Batch:280-186966					
280-45300-1	J1RR98	T	Solid	D-2216	
280-45300-1DU	Duplicate	T	Solid	D-2216	

Report Basis
T = Total