SAF-RC-207
Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites – In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 2/28/13
INITIAL/DATE

COMMENTS:

SDG J01726 SAF-RC-207

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-C-7:1 (034 footprint)

Analytical Data Package Prepared For

Washington Closure Hanford

Radiochemical Analysis By

TestAmerica

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

Assigned Laboratory Code: TARL

Data Package Contains 25 *Pages*

Report No.: 54699

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.
J01726	RC-207	J1RFK6	J3B260439-1	MX7371AA	9MX73710	3057079
		J1RFK7	J3B260439-2	MX7381AA	9MX73810	3057079
		J1RFK8	J3B260439-3	MX7391AA	9MX73910	3057079
		J1RFK9	J3B260439-4	MX74A1AA	9MX74A10	3057079
		J1RH42	J3B260439-5	MX74C1AA	9MX74C10	3057079
		J1RH43	J3B260439-6	MX74D1AA	9MX74D10	3057079

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

TestAmerica Laboratories, Inc.

Washington Closure Hanford
2620 Fermi Avenue
Richland, WA 99354

February 27, 2013

Attention: Joan Kessner

SAF Number	:	RC-207
Date SDG Closed	:	February 26, 2013
Number of Samples	:	Six (6)
Sample Type	:	Soil
SDG Number	:	J01726
Data Deliverable	:	Quick Turn / Summary

CASE NARRATIVE

I. Introduction

On February 26, 2013, six soil samples were received at TestAmerica for chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Washington Closure Hanford (WCH) specific ID;

WCH ID#	TARL ID#	MATRIX	DATE OF RECEIPT
J1RFK6	MX737	SOIL	2/26/13
J1RFK7	MX738	SOIL	2/26/13
J1RFK8	MX739	SOIL	2/26/13
J1RFK9	MX74A	SOIL	2/26/13
J1RH42	MX74C	SOIL	2/26/13
J1RH43	MX74D	SOIL	2/26/13

II. Sample Receipt

The samples were 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:

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

IV. Quality Control

SDG J01726 includes a minimum of one Laboratory Control Samples (LCS), one method (reagent)

blank, a duplicate sample, matrix spike sample and a matrix spike duplicate sample. Any exceptions have been noted in the "Comments" section.

Blanks and LCS are reported in mg/L units, other QC and sample results are reported in the same units.

V. Comments

Chemical Analysis
Hexavalent Chromium by EPA method 7196A

Batch 3057079:
The LCS, batch blank, samples, sample duplicate (J1RFK6) and sample matrix spike (J1RFK6) 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 TARL

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

Date: 27-Feb-13

Report No. : 54699

SDG No: J01726

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
3057079	7196_CR6								
	J1RFK6								
	MX7371AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	MX7371AD	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	0.0
	J1RFK7								
	MX7381AA	HEXCHROME	1.22E+00 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1RFK8								
	MX7391AA	HEXCHROME	5.86E-01 +- 0.0E+00		mg/kg	N/A	1.55E-01	1.55E-01	
	J1RFK9								
	MX74A1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RH42								
	MX74C1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	
	J1RH43								
	MX74D1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A	1.55E-01	1.55E-01	

No. of Results: 7

TestAmerica

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: 27-Feb-13

TestAmerica TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 54699

SDG No.: J01726

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
7196_CR6								
3057079 MATRIX SPIKE, J1RFK6								
MX7371AC	HEXCHROME	2.54E+01 +- 0.0E+00		mg/kg	N/A	87%	-0.1	1.55E-01
3057079 LCS,								
MX74E1AC	HEXCHROME	1.83E+01 +- 0.0E+00		mg/kg	N/A	96%	0.0	1.55E-01
3057079 BLANK QC,								
MX74E1AA	HEXCHROME	1.55E-01 +- 0.0E+00	U	mg/kg	N/A			1.55E-01

No. of Results: 3

TestAmerica

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: 27-Feb-13

Lab Name:	TestAmerica	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:00:00 PM
Lot-Sample No.:	J3B260439-1	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	J1RFK6	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:**	MX7371AA		**Report DB ID:**	9MX73710				
HEXCHROME	**1.55E-01**	U		0.0E+00	1.55E-01	mg/kg	N/A	*1.*	2/26/13 04:30 p		2.5098	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

Lab Name:	TestAmerica	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:05:00 PM
Lot-Sample No.:	J3B260439-2	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	J1RFK7	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:** MX7381AA			**Report DB ID:** 9MX73810					
HEXCHROME	1.22E+00			0.0E+00	1.55E-01	mg/kg	N/A	*(7.9)*	2/26/13 04:30 p		2.514	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

Lab Name:	**TestAmerica**	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:10:00 PM
Lot-Sample No.:	**J3B260439-3**	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	**J1RFK8**	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:**	MX7391AA		**Report DB ID:**	9MX73910				
HEXCHROME	**5.86E-01**			0.0E+00	1.55E-01	mg/kg	N/A	*(3.8)*	2/26/13 04:30 p		2.5015	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

Lab Name:	**TestAmerica**	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:15:00 PM
Lot-Sample No.:	**J3B260439-4**	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	**J1RFK9**	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:** MX74A1AA			**Report DB ID:** 9MX74A10					
HEXCHROME	**1.55E-01**	U		0.0E+00	1.55E-01	mg/kg	N/A	*1.*	2/26/13 04:30 p		2.5063	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

Lab Name:	**TestAmerica**	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:20:00 PM
Lot-Sample No.:	**J3B260439-5**	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	**J1RH42**	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:** MX74C1AA			**Report DB ID:** 9MX74C10					
HEXCHROME	**1.55E-01**	U		0.0E+00	1.55E-01	mg/kg	N/A	*1.*	2/26/13 04:30 p		2.5075	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

Lab Name:	**TestAmerica**	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:25:00 PM
Lot-Sample No.:	**J3B260439-6**	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	**J1RH43**	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:** MX74D1AA			**Report DB ID:** 9MX74D10					
HEXCHROME	**1.55E-01**	U		0.0E+00	1.55E-01	mg/kg	N/A	*1.*	2/26/13 04:30 p		2.5089	
							1.55E-01	*N/A*			g	

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

TestAmerica
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: 27-Feb-13

DUPLICATE RESULTS

Lab Name:	**TestAmerica**	**SDG:**	J01726	**Collection Date:**	2/26/2013 2:00:00 PM
Lot-Sample No.:	**J3B260439-1**	**Report No. :**	54699	**Received Date:**	2/26/2013 3:45:00 PM
Client Sample ID:	**J1RFK6**	**COC No. :**	RC-207-173	**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: 3057079	7196_CR6			**Work Order:** MX7371AD		**Report DB ID:** MX7371ER			**Orig Sa DB ID:** 9MX73710			
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	1.	2/26/13 04:30 p		2.5042	
	1.55E-01	U	**RPD**	**0.0**		1.55E-01		N/A			g	

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

TestAmerica
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

BLANK RESULTS

Date: 27-Feb-13

Lab Name: TestAmerica

Matrix: SOIL

SDG: J01726

Report No. : 54699

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: 3057079	7196_CR6			**Work Order:**	MX74E1AA		**Report DB ID:**	MX74E1AB				
HEXCHROME	1.55E-01	U		0.0E+00	1.55E-01	mg/kg	N/A	1.	2/26/13 04:30 p		2.5	
						1.55E-01		N/A			g	

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

TestAmerica
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: 27-Feb-13

Lab Name: TestAmerica

Matrix: SOIL

SDG: J01726

Report No. : 54699

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: 3057079	7196_CR6			**Work Order:**	MX74E1AC		**Report DB ID:**	MX74E1AS					
HEXCHROME	1.83E+01			0.0E+00	1.55E-01	mg/kg	N/A	1.90E+01		96%	2/26/13 04:30 p	2.5	
							Rec Limits:	80	120	0.0		g	

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

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

rptSTLRchLcs
V5.2.23 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 27-Feb-13

Lab Name: TestAmerica **SDG:** J01726

Lot-Sample No.: J3B260439-1, J1RFK6 **Report No. :** 54699 **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: 3057079	**Work Order:** MX7371AC			**Report DB ID:** MX7371CW			**Orig Sa DB ID:** 9MX73710					
HEXCHROME	2.54E+01			0.0E+00	1.55E-01	mg/kg	N/A	87.15%	2.91E+01	2/26/13 04:30 p	2.501	7196_CR6
	1.55E-01										g	

Number of Results: 1

Comments:

TestAmerica
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

Richland Laboratory
Data Review Check List
Hexavalent Chromium

Batch Number(s):	3057079	Lab Sample Numbers or SDG:	J01726

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:

Analyst H. Rahari Date 2/27/13 2nd Review [signature] Date 2/27/13

CG-231 Rev 1 5/12

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-207-173	Page 1 of 2

Collector R. Brackett	**Company Contact** Joan Kessner	**Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH
Project Designation Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	**Sampling Location** 100-C-7:1 (034 footprint)		**SAF No.** RC-207
Ice Chest No. N/A	**Field Logbook No.** EL-1655-08	**COA** R00C712600	**Method of Shipment** Hand deliver
Shipped To TestAmerica Incorporated, Richland	**Offsite Property No.** N/A		**Bill of Lading/Air Bill No.** N/A

Price Code ~~8L~~ 02/26/13 **Data Turnaround** ~~21 Days~~ quick turn

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 degrees centigrade

J3B260439

J01726
Due 2-27-13

J3B260439

Preservation	Cool 4C										
Type of Container	G/P										
No. of Container(s)	1										
Volume	125mL										
	Chromium Hex - 7196 - Quick Turn										

Sample No.	Matrix *	Sample Date	Sample Time									
J1RFK6 mXM37	SOIL	02/26/13	1400	X								
J1RFK7 mXM38	SOIL	02/26/13	1405	X								
J1RFK8 mXM39	SOIL	02/26/13	1410	X								
J1RFK9 mXM4A	SOIL	02/26/13	1415	X								
J1RH42 mXM4C	SOIL	02/26/13	1420	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: Rob Brackett	1430 7-26-13	Received By/Stored In: R. Fahlberg	1430 2-26-13
Relinquished By/Removed From: R. Fahlberg	1530 2-26-13	Received By/Stored In: A. Freier	1530 2-26-13
Relinquished By/Removed From: WCH A Freier	1545 2-26-13	Received By/Stored In: J. Bockbock TRC	2-26-13 1545
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

REVIEWED BY CMB DATE 2-26-13

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-207-173	Page 2 of 2
Collector R. Brackett	**Company Contact** Joan Kessner **Telephone No.** 509-375-4688	**Project Coordinator** KESSNER, JH	**Price Code** ~~8L~~ **Data Turnaround** ~~21 Days~~ Quick Turn
Project Designation Remedial Action of the 100-C-7 & 100-C-7:1 Waste Sites - I	**Sampling Location** 100-C-7:1 (034 footprint)	**SAF No.** RC-207	
Ice Chest No. N/A	**Field Logbook No.** EL-1655-08 **COA** R00C712600	**Method of Shipment** Hand deliver	
Shipped To TestAmerica Incorporated, Richland	**Offsite Property No.** N/A	**Bill of Lading/Air Bill No.** N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 degrees centigrade

J3B260439

J01726
Due 2-27-13

SAMPLE ANALYSIS

Preservation	Cool 4C											
Type of Container	G/P											
No. of Container(s)	1											
Volume	125mL											
	Chromium Hex - 7196 - Quick Turn											
Sample No.	Matrix *	Sample Date	Sample Time									
J1RH43 m XM4D	SOIL	02/26/13	1425	X								

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From Rob Brackett	1430 2-26-13	Received By/Stored In R. Fahlberg R. Fahlberg	1430 2-26-13
Relinquished By/Removed From R. Fahlberg R. Fahlberg	1530 2-26-13	Received By/Stored In A. Freier A. Freier	1530 2-26-13
Relinquished By/Removed From A. Freier A. Freier	~~2-26-2013~~ 2-26-13 1545	Received By/Stored In J. Buck TALR	2-26-13 1545
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

REVIEWED BY CMB DATE 2-26-13

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

WCH-EE-011

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sample Check-in List

Date/Time Received: 2-26-13 | 1545 Container GM Screen Result: (Airlock) .30 Initials [B]
Sample GM Screen Result (Sample Receiving) .6 Initials [B]

Client: WCA SDG #: J01726 NA [ ] SAF #: RL-207 NA [ ]

Lot Number: J3B260439

Chain of Custody # RL-207-173

Shipping Container ID: hand delivery NA [✓] Air Bill Number: NA [✓]

Samples received inside shipping container/cooler/box Yes [✓] 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 [✓]
2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [✓]
3. Cooler temperature: 4.0 °C OK 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 [✓] No [ ]
6. Number of samples received (Each sample may contain multiple bottles): 6
7. Containers received: 6 x 125 mLp
8. Sample holding times exceeded? NA [ ] Yes [ ] No [✓]
9. Samples have:
   ___ tape
   [✓] custody seals
   ___ hazard labels
   [✓] appropriate sample labels
10. Matrix:
    [✓] A (FLT, Wipe, Solid, Soil)
    ___ S (Air, Niosh 7400)
    ___ I (Water)
    ___ T (Biological, Ni-63)
11. Samples:
    [✓] are in good condition
    ___ are broken
    ___ Other
    ___ are leaking
    ___ have air bubbles (Only for samples requiring no head space)
12. Sample pH appropriate for analysis requested Yes [ ] No [ ] NA [✓]
    (If acidification is necessary, then document sample ID, initial pH, amount of HNO_3 added and pH after addition on table overleaf)

    RPL ID # of preservative used : N/A
13. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
14. Description of anomalies (include sample numbers): NA [✓]

LS-023, Rev. 15, 07/11 See over for additional information.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

15. Sample Location, Sample Collector Listed on COC? * Yes [X] No [ ]
*For documentation only. No corrective action needed.

16. Additional Information: N/A

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

Sample Custodian: [signature] Date: 2-26-13

Client Informed on _____ by _____ Person contacted _____

[X] No action necessary; process as is

Project Manager [signature] Date 2/26/13

SAMPLE ID	Initial pH	Acid Amt	Final pH	SAMPLE ID	Initial pH	Acid Amt	Final pH

JB 2-26-13 JB 2-26-13

J3 B260439 [signature] 2/26/13

LS-023, Rev. 15, 07/11

See over for additional information.

2/26/2013 5:17:26 PM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC ,
Washington Closure Hanford LLC

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

Balance Id:

Pipet #: _____

AnalyDueDate: 02/27/2013

Batch: 3057079 SOIL mg/kg
SEQ Batch, Test: None All Tests: 3057079 DWEA,

PM, Quote: RW2, 88144

Sep1 DT/Tm Tech:

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 MX737-1-AA													
J3B260439-1-SAMP													
02/26/2013 14:00			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
2 MX737-1-AC-S													
J3B260439-1-MS													
02/26/2013 14:00			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
3 MX737-1-AD-X													
J3B260439-1-DUP													
02/26/2013 14:00			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
4 MX737-1-AE-S													
J3B260439-1-MS													
02/26/2013 14:00			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
5 MX738-1-AA													
J3B260439-2-SAMP													
02/26/2013 14:05			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
6 MX739-1-AA													
J3B260439-3-SAMP													
02/26/2013 14:10			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
7 MX74A-1-AA													
J3B260439-4-SAMP													
02/26/2013 14:15			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:

TestAmerica Richland Wa. Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 ISV - Insufficient Volume for Analysis WO Cnt: 7
pd - Prep Dt, dc - Date Chg, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added ICOC v4.8.49

2/26/2013 5:17:27 PM

Sample Preparation/Analysis

127642, Washington Closure Hanford LLC
Washington Closure Hanford LLC

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

Balance Id:
Pipet #:

AnalyDueDate: 02/27/2013

Sep1 DT/Tm Tech:

Batch: 3057079 SOIL mg/kg PM, Quote: RW2, 88144
SEQ Batch, Test: None

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:
8 MX74C-1-AA													
J3B260439-5-SAMP													
02/26/2013 14:20			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
9 MX74D-1-AA													
J3B260439-6-SAMP													
02/26/2013 14:25			AmtRec: 1X125MLP		#Containers: 1				Scr:		Alpha:		Beta:
10 MX74E-1-AA-B													
J3B260000-79-BLK													
02/26/2013 17:17 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:
11 MX74E-1-AC-C													
J3B260000-79-LCS													
02/26/2013 17:17 pd			AmtRec:		#Containers: 1				Scr:		Alpha:		Beta:

Comments:

```
All Clients for Batch:
    127642, Washington Closure Hanford LLC          Washington Closure Hanford LLC,  RW2, 88144

MX7371AA-SAMP Constituent List:

MX7371AC-MS Constituent List:

MX7371AE-MS:

MX74E1AA-BLK:
```

2/26/2013 5:17:27 PM

Sample Preparation/Analysis

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

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

AnalyDueDate: 02/27/2013

Batch: 3057079 mg/kg
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:

```
MX74E1AC-LCS:

MX7371AA-SAMP Calc Info:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
MX7371AC-MS Calc Info:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
MX7371AE-MS:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
MX74E1AA-BLK:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
MX74E1AC-LCS:
     Uncert Level (#s).: 2     Decay to SaDt: Y     Blk Subt.: N     Sci.Not.: Y     ODRs: B
```