

**SAF-RC-192**  
**100N Field Remediation - Water**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt H4-21

KW 8/18/11  
INITIAL/DATE

**COMMENTS:**

**SDG J01187 SAF-RC-192**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Sample Location: 100-N-84:6**

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 30 Pages

Report No.: 47914

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.
J01187	RC-192	J1K7K2	J1G260454-1	MK6JE1AA	9MK6JE10	1207161
		J1K7K2	J1G260454-1	MK6JE1AC	9MK6JE10	1207166

## Certificate of Analysis

Washington Hanford Closure  
2620 Fermi Avenue  
Richland, WA 99354

August 15, 2011

Attention: Joan Kessner

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SAF Number	:	RC-192
Date SDG Closed	:	July 26, 2011
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	J01187
Data Deliverable	:	21- Day / Summary

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### CASE NARRATIVE

#### I. Introduction

On July 26, 2011 one water 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:

<u>WCH ID#</u>	<u>TARL ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J1K7K2	MK6JE	WATER	7/26/11

#### 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:

**Gamma Spectroscopy**

Gamma Spec by method RL-GAM-001

**Chemical Analysis**

Hexavalent Chromium by EPA method 7196A

Washington Closure Hanford  
August 15, 2011

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**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**

**Gamma Spectroscopy**

Gamma Spec by method RL-GAM-001:

The LCS, batch blank, sample and sample duplicate (J1K7K2) results are within contractual requirements.

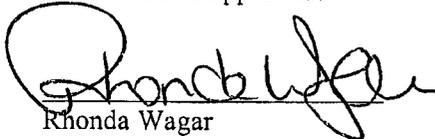
**Chemical Analysis**

Hexavalent Chromium by EPA method 7196A

The LCS, batch blank, sample, sample duplicate (J1K7K2), sample matrix spike (J1K7K2), and matrix spike duplicate (J1K7K2) 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,  $R = \text{constants} * f(x,y,z,...)$ . 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 ( $S/\sqrt{n}$ ), 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

<b>Action Lev</b>	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.
<b>Batch</b>	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
<b>Bias</b>	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
<b>COC No</b>	Chain of Custody Number assigned by the Client or TestAmerica.
<b>Count Error (#s)</b>	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.
<b>Total Uncert (#s) <i>u<sub>c</sub>-Combined Uncertainty.</i></b>	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, <i>u<sub>c</sub> the combined uncertainty.</i> The uncertainty is absolute and in the same units as the result.
<b>(#s), Coverage Factor</b>	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
<b>CRDL (RL)</b>	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)
<b>Lc</b>	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.
<b>Lot-Sample No</b>	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.
<b>MDC MDA</b>	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.
<b>Primary Detector</b>	The instrument identifier associated with the analysis of the sample aliquot.
<b>Ratio U-234/U-238</b>	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.
<b>Rst/MDC</b>	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.
<b>Rst/TotUcert</b>	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.
<b>Report DB No</b>	Sample Identifier used by the report system. The number is based upon the first five digits of the <b>Work Order</b> Number.
<b>RER</b>	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.
<b>SDG</b>	Sample Delivery Group Number assigned by the Client or assigned by TestAmerica upon sample receipt.
<b>Sum Rpt Alpha Spec Rst(s)</b>	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.
<b>Work Order</b>	The LIMS software assign test specific identifier.
<b>Yield</b>	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

### Sample Results Summary

Date: 15-Aug-11

#### TestAmerica TARL

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

Report No. : 47914

SDG No: J01187

Client Id		Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Tracer Yield	MDC or MDA	CRDL	RPD
Batch	Work Order								
1207161 GAMMA_GS									
J1K7K2									
MK6JE1AA	AMERICIUM 241		-2.52E+01 +- 2.4E+01	U	pCi/L		3.83E+01		
	CE-144		-2.07E+01 +- 3.2E+01	U	pCi/L		5.24E+01		
	CO-60		-1.16E-01 +- 5.7E+00	U	pCi/L		9.80E+00	2.50E+01	
	CS-134		-2.32E+00 +- 6.5E+00	U	pCi/L		1.11E+01	1.50E+01	
	CS-137		-4.11E+00 +- 6.6E+00	U	pCi/L		1.08E+01	1.50E+01	
	EU-152		4.01E+00 +- 1.9E+01	U	pCi/L		3.14E+01	5.00E+01	
	EU-154		1.24E+01 +- 1.6E+01	U	pCi/L		2.91E+01	5.00E+01	
	EU-155		-2.12E+01 +- 1.7E+01	U	pCi/L		2.74E+01	5.00E+01	
	RU-106		-1.83E+00 +- 5.9E+01	U	pCi/L		1.00E+02		
	SB-125		2.71E+00 +- 1.7E+01	U	pCi/L		2.83E+01	5.00E+01	
	ZN-65		-6.18E-01 +- 1.2E+01	U	pCi/L		2.10E+01		
J1K7K2 DUP									
MK6JE1AF	AMERICIUM 241		-3.42E+01 +- 6.1E+01	U	pCi/L		1.02E+02		-30.1
	CE-144		-5.26E+00 +- 3.9E+01	U	pCi/L		6.46E+01		-118.9
	CO-60		5.23E+00 +- 7.3E+00	U	pCi/L		1.30E+01	2.50E+01	209.1
	CS-134		6.01E+00 +- 8.1E+00	U	pCi/L		1.38E+01	1.50E+01	452.2
	CS-137		6.51E+00 +- 7.4E+00	U	pCi/L		1.28E+01	1.50E+01	885.1
	EU-152		7.89E+00 +- 2.0E+01	U	pCi/L		3.44E+01	5.00E+01	65.3
	EU-154		-1.81E+01 +- 2.4E+01	U	pCi/L		3.85E+01	5.00E+01	-1056.3
	EU-155		-2.80E+00 +- 2.0E+01	U	pCi/L		3.42E+01	5.00E+01	-153.4
	RU-106		1.05E+01 +- 6.5E+01	U	pCi/L		1.11E+02		284.4
	SB-125		8.83E+00 +- 2.0E+01	U	pCi/L		3.32E+01	5.00E+01	105.9
	ZN-65		-5.59E+01 +- 2.0E+01	U	pCi/L		2.77E+01		-195.6
1207166 7196_CR6									
J1K7K2									
MK6JE1AC	HEXCHROME		3.70E-03 +- 0.0E+00	U	mg/L	N/A	3.70E-03	3.50E-01	
MK6JE1AH	HEXCHROME		3.70E-03 +- 0.0E+00	U	mg/L	N/A	3.70E-03	3.50E-01	0.0
No. of Results: 24									

TestAmerica

RPD - Relative Percent Difference.

rptSTLRchSaSummary2 V5.2.15  
A2002

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: 15-Aug-11

TestAmerica TARL

Ordered by Method, Batch No, QC Type,.

Report No. : 47914

SDG No.: J01187

Batch	Work Order	Parameter	Result +/- Uncertainty ( 2s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDC MDA
<b>GAMMA_GS</b>									
1207161 BLANK QC,									
	MK6KC1AA	AMERICIUM 241	1.60E+01 +/- 2.6E+01	U	pCi/L				3.91E+01
		CE-144	-1.95E+01 +/- 3.2E+01	U	pCi/L				5.35E+01
		CO-60	-4.24E+00 +/- 5.9E+00	U	pCi/L				9.66E+00
		CS-134	-1.79E+00 +/- 6.8E+00	U	pCi/L				1.16E+01
		CS-137	3.79E+00 +/- 6.4E+00	U	pCi/L				1.10E+01
		EU-152	-4.35E+00 +/- 1.8E+01	U	pCi/L				3.09E+01
		EU-154	-9.38E+00 +/- 1.7E+01	U	pCi/L				2.79E+01
		EU-155	-2.12E+01 +/- 1.7E+01	U	pCi/L				2.79E+01
		RU-106	-3.01E+01 +/- 5.8E+01	U	pCi/L				9.62E+01
		SB-125	1.07E+01 +/- 1.6E+01	U	pCi/L				2.81E+01
		ZN-65	1.32E+01 +/- 1.3E+01	U	pCi/L				2.27E+01
1207161 LCS,									
	MK6KC1AC	CO-60	8.92E+01 +/- 1.8E+01		pCi/L		59%	-0.4	1.07E+01
		CS-137	2.01E+02 +/- 2.8E+01		pCi/L		100%	0.0	1.28E+01
		EU-152	2.93E+02 +/- 5.3E+01		pCi/L		97%	0.0	3.55E+01
<b>7196_CR6</b>									
1207166 MATRIX SPIKE, J1K7K2									
	MK6JE1AJ	HEXCHROME	2.82E-01 +/- 0.0E+00		mg/L	N/A	107%	0.1	3.70E-03
	MK6JE1AK	HEXCHROME	2.85E-01 +/- 0.0E+00		mg/L	N/A	108%	0.1	3.70E-03
1207166 LCS,									
	MK6LG1AC	HEXCHROME	5.09E-01 +/- 0.0E+00		mg/L	N/A	102%	0.0	3.70E-03
1207166 BLANK QC,									
	MK6LG1AA	HEXCHROME	3.70E-03 +/- 0.0E+00	U	mg/L	N/A			3.70E-03
<b>No. of Results: 18</b>									

TestAmerica Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSummary V5.2.15 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.  
 A2002

FORM I

SAMPLE RESULTS

Date: 15-Aug-11

Lab Name: TestAmerica  
 Lot-Sample No.: J1G260454-1  
 Client Sample ID: J1K7K2  
 SDG: J01187  
 Report No.: 47914  
 COC No.: RC-192-006  
 Matrix: WATER  
 Collection Date: 7/26/2011 8:40:00 AM  
 Received Date: 7/26/2011 12:15:00 PM

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 1207161	Work Order: MK6JE1AA Report DB ID: 9MK6JE10											
AMERICIUM 241	GAMMA_GS	-2.52E+01	U	2.4E+01	2.4E+01	3.83E+01 pCi/L		-0.66 -(2.1)	8/4/11 10:17 a	0.5033	L	GER10S1
CE-144		-2.07E+01	U	3.2E+01	3.2E+01	5.24E+01 pCi/L		-0.39 -(1.3)	8/4/11 10:17 a	0.5033	L	GER10S1
CO-60		-1.16E-01	U	5.7E+00	5.7E+00	9.80E+00 pCi/L	2.50E+01	-0.01 -0.04	8/4/11 10:17 a	0.5033	L	GER10S1
CS-134		-2.32E+00	U	6.5E+00	6.5E+00	1.11E+01 pCi/L	1.50E+01	-0.21 -0.71	8/4/11 10:17 a	0.5033	L	GER10S1
CS-137		-4.11E+00	U	6.6E+00	6.6E+00	1.08E+01 pCi/L	1.50E+01	-0.38 -(1.3)	8/4/11 10:17 a	0.5033	L	GER10S1
EU-152		4.01E+00	U	1.9E+01	1.9E+01	3.14E+01 pCi/L	5.00E+01	0.13 0.43	8/4/11 10:17 a	0.5033	L	GER10S1
EU-154		1.24E+01	U	1.6E+01	1.6E+01	2.91E+01 pCi/L	5.00E+01	0.42 (1.5)	8/4/11 10:17 a	0.5033	L	GER10S1
EU-155		-2.12E+01	U	1.7E+01	1.7E+01	2.74E+01 pCi/L	5.00E+01	-0.77 -(2.5)	8/4/11 10:17 a	0.5033	L	GER10S1
RU-106		-1.83E+00	U	5.9E+01	5.9E+01	1.00E+02 pCi/L		-0.02 -0.06	8/4/11 10:17 a	0.5033	L	GER10S1
SB-125		2.71E+00	U	1.7E+01	1.7E+01	2.83E+01 pCi/L	5.00E+01	0.1 0.33	8/4/11 10:17 a	0.5033	L	GER10S1

FORM I

Date: 15-Aug-11

SAMPLE RESULTS

Lab Name: TestAmerica  
 Lot-Sample No.: J1G260454-1  
 Client Sample ID: J1K7K2

SDG: J01187  
 Report No.: 47914  
 COC No.: RC-192-006

Collection Date: 7/26/2011 8:40:00 AM  
 Received Date: 7/26/2011 12:15:00 PM  
 Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
ZN-65	-6.18E-01	U	1.2E+01	1.2E+01	2.10E+01	pCi/L		-0.03 -0.1	8/4/11 10:17 a	0.5033	L	GER10\$1
Batch: 1207166	7196_CR6							Work Order: MK6JE1AC				
HEXCHROME	3.70E-03	U	0.0E+00	0.0E+00	3.70E-03	mg/L	N/A	1.	7/26/11 03:45 p	25.0	ML	
							3.50E-01	N/A				

No. of Results: 12 Comments:

FORM II

Date: 15-Aug-11

DUPLICATE RESULTS

Lab Name: TestAmerica  
 Lot-Sample No.: J1G260454-1  
 Client Sample ID: J1K7K2  
 SDG: J01187  
 Report No.: 47914  
 COC No.: RC-192-006  
 Matrix: WATER  
 Collection Date: 7/26/2011 8:40:00 AM  
 Received Date: 7/26/2011 12:15:00 PM

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 1207166	7196_CR6											
HEXCHROME	3.70E-03	U		0.0E+00	3.70E-03	mg/L	N/A	1.	7/26/11 03:45 p		25.0	ML
	3.70E-03	U	RPD 0.0			3.50E-01	N/A	N/A				
Work Order: MKGJE1AH Report DB ID: MKGJE1ER Orig Sa DB ID: 9MKGJE10												

No. of Results: 1 Comments:

TestAmerica RPD - Relative Percent Difference.

rptSTLRchDupV5.2 MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

.15 A2002 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: 15-Aug-11

DUPLICATE RESULTS

Lab Name: TestAmerica  
 Lot-Sample No.: J1G260454-1  
 Client Sample ID: J1K7K2 DUP

SDG: J01187  
 Report No.: 47914  
 COC No.: RC-192-006  
 Matrix: WATER

Collection Date: 7/26/2011 8:40:00 AM  
 Received Date: 7/26/2011 12:15:00 PM

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 1207161	Work Order: MKGJE1AF Report DB ID: MKGJE1FR Orig Sa DB ID: 9MKGJE10											
AMERICIUM 241	-3.42E+01	U	6.1E+01	6.1E+01	1.02E+02	pCi/L		-0.34	8/11/11 09:08 a		0.5033	GER13\$1
	-2.52E+01	U	RPD -30.1					-(1.1)			L	
CE-144	-5.26E+00	U	3.9E+01	3.9E+01	6.46E+01	pCi/L		-0.08	8/11/11 09:08 a		0.5033	GER13\$1
	-2.07E+01	U	RPD -118.9					-0.27			L	
CO-60	5.23E+00	U	7.3E+00	7.3E+00	1.30E+01	pCi/L		0.4	8/11/11 09:08 a		0.5033	GER13\$1
	-1.16E-01	U	RPD 209.1			2.50E+01		(1.4)			L	
CS-134	6.01E+00	U	8.1E+00	8.1E+00	1.38E+01	pCi/L		0.43	8/11/11 09:08 a		0.5033	GER13\$1
	-2.32E+00	U	RPD 452.2			1.50E+01		(1.5)			L	
CS-137	6.51E+00	U	7.4E+00	7.4E+00	1.28E+01	pCi/L		0.51	8/11/11 09:08 a		0.5033	GER13\$1
	-4.11E+00	U	RPD 885.1			1.50E+01		(1.8)			L	
EU-152	7.89E+00	U	2.0E+01	2.0E+01	3.44E+01	pCi/L		0.23	8/11/11 09:08 a		0.5033	GER13\$1
	4.01E+00	U	RPD 65.3			5.00E+01		0.78			L	
EU-154	-1.81E+01	U	2.4E+01	2.4E+01	3.85E+01	pCi/L		-0.47	8/11/11 09:08 a		0.5033	GER13\$1
	1.24E+01	U	RPD -1056.3			5.00E+01		-(1.5)			L	
EU-155	-2.80E+00	U	2.0E+01	2.0E+01	3.42E+01	pCi/L		-0.08	8/11/11 09:08 a		0.5033	GER13\$1
	-2.12E+01	U	RPD -153.4			5.00E+01		-0.28			L	
RU-106	1.05E+01	U	6.5E+01	6.5E+01	1.11E+02	pCi/L		0.09	8/11/11 09:08 a		0.5033	GER13\$1
	-1.83E+00	U	RPD 284.4					0.32			L	
SB-125	8.83E+00	U	2.0E+01	2.0E+01	3.32E+01	pCi/L		0.27	8/11/11 09:08 a		0.5033	GER13\$1
	2.71E+00	U	RPD 105.9			5.00E+01		0.9			L	
ZN-65	-5.59E+01	U	2.0E+01	2.0E+01	2.77E+01	pCi/L		-(2.)	8/11/11 09:08 a		0.5033	GER13\$1
	-6.18E-01	U	RPD -195.6					-(5.7)			L	

TestAmerica RPD - Relative Percent Difference.

rp|STLRchDupV5.2 MDC|MDA,Le - 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: 15-Aug-11

DUPLICATE RESULTS

Lab Name: TestAmerica  
 Lot-Sample No.: J1G260454-1  
 Client Sample ID: J1K7K2 DUP  
 SDG: J01187  
 Report No.: 47914  
 COC No.: RC-192-006  
 Matrix: WATER  
 Collection Date: 7/26/2011 8:40:00 AM  
 Received Date: 7/26/2011 12:15:00 PM

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/TotUcert	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
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No. of Results: 11 Comments:

**FORM II**  
**BLANK RESULTS**

Date: 15-Aug-11

Lab Name: **TestAmerica**      SDG: **J01187**  
 Matrix: **WATER**      Report No.: **47914**

Parameter	Result	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
<b>Batch: 1207166</b>												
7196_CR6												
HEXCHROME	3.70E-03	U		0.0E+00	3.70E-03	mg/L	N/A	1.	7/26/11 03:45 p		100.0	ML
						3.50E-01		N/A				
<b>Work Order: MK6LG1AA      Report DB ID: MK6LG1AB</b>												
<b>Batch: 1207161</b>												
GAMMA_GS												
AMERICIUM 241	1.60E+01	U	2.6E+01	2.6E+01	3.91E+01	pCi/L		0.41	8/5/11 08:29 a		0.504	GER10\$1
								(1.2)			L	
CE-144	-1.95E+01	U	3.2E+01	3.2E+01	5.35E+01	pCi/L		-0.37	8/5/11 08:29 a		0.504	GER10\$1
								-(1.2)			L	
CO-60	-4.24E+00	U	5.9E+00	5.9E+00	9.66E+00	pCi/L		-0.44	8/5/11 08:29 a		0.504	GER10\$1
								-(1.4)			L	
CS-134	-1.79E+00	U	6.8E+00	6.8E+00	1.16E+01	pCi/L		-0.15	8/5/11 08:29 a		0.504	GER10\$1
								-0.52			L	
CS-137	3.79E+00	U	6.4E+00	6.4E+00	1.10E+01	pCi/L		0.35	8/5/11 08:29 a		0.504	GER10\$1
								(1.2)			L	
EU-152	-4.35E+00	U	1.8E+01	1.8E+01	3.09E+01	pCi/L		-0.14	8/5/11 08:29 a		0.504	GER10\$1
								-0.47			L	
EU-154	-9.38E+00	U	1.7E+01	1.7E+01	2.79E+01	pCi/L		-0.34	8/5/11 08:29 a		0.504	GER10\$1
								-(1.1)			L	
EU-155	-2.12E+01	U	1.7E+01	1.7E+01	2.79E+01	pCi/L		-0.76	8/5/11 08:29 a		0.504	GER10\$1
								-(2.5)			L	
RU-106	-3.01E+01	U	5.8E+01	5.8E+01	9.62E+01	pCi/L		-0.31	8/5/11 08:29 a		0.504	GER10\$1
								-(1.)			L	
SB-125	1.07E+01	U	1.6E+01	1.6E+01	2.81E+01	pCi/L		0.38	8/5/11 08:29 a		0.504	GER10\$1
								(1.3)			L	

TestAmerica      MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rpt|STLRchBlank      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.  
 V5.2.15 A2002

**FORM II  
BLANK RESULTS**

Date: 15-Aug-11

Lab Name: TestAmerica      SDG: J01187  
 Matrix: WATER              Report No.: 47914

Parameter	Result	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
ZN-65	1.32E+01	U	1.3E+01	1.3E+01	2.27E+01	pCi/L		0.58 (2.1)	8/5/11 08:29 a		0.504 L	GER10\$1

No. of Results: 12      Comments:

**FORM II  
LCS RESULTS**

Date: 15-Aug-11

Lab Name: TestAmerica      SDG: J01187  
 Matrix: WATER              Report No.: 47914

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 1207166    7196_CR6    Work Order: MK6LG1AC    Report DB ID: MK6LG1AS													
HEXCHROME	5.09E-01			0.0E+00	3.70E-03	mg/L	N/A	5.00E-01		102%	7/26/11 03:45 p	100.0	
Rec Limits:    70    130    0.0    ML													
Batch: 1207161    GAMMA_GS    Work Order: MK6KC1AC    Report DB ID: MK6KC1CS													
CO-60	8.92E+01		1.8E+01	1.8E+01	1.07E+01	pCi/L		1.51E+02	1.3E+00	59%	8/6/11 06:36 a	0.5018	GER10\$1
CS-137	2.01E+02		2.8E+01	2.8E+01	1.28E+01	pCi/L	Rec Limits:	70	130	-0.4		L	
							Rec Limits:	2.00E+02	4.1E+00	100%	8/6/11 06:36 a	0.5018	GER10\$1
EU-152	2.93E+02		5.3E+01	5.3E+01	3.55E+01	pCi/L	Rec Limits:	70	130	0.0		L	
							Rec Limits:	3.03E+02	4.3E+00	97%	8/6/11 06:36 a	0.5018	GER10\$1
Rec Limits:    70    130    0.0    L													

No. of Results: 4    Comments:

Date: 15-Aug-11

FORM II  
MATRIX SPIKE RESULTS

Lab Name: TestAmerica SDG: J01187  
Lot-Sample No.: J1G260454-1, J1K7K2 Report No.: 47914 Matrix: WATER

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: 1207166												
HEXCHROME	2.82E-01	MK6JE1AJ	MK6JE1AJ	0.0E+00	MK6JE1CW	3.70E-03 mg/L	N/A	107.16%	2.63E-01	7/26/11 03:45 p	25.0	7196_CR6
	3.70E-03										ML	
Batch: 1207166												
HEXCHROME	2.85E-01	MK6JE1AK	MK6JE1AK	0.0E+00	MK6JE1DW	3.70E-03 mg/L	N/A	108.30%	2.63E-01	7/26/11 03:45 p	25.0	7196_CR6
	2.82E-01										ML	

Number of Results: 2

Comments:

TestAmerica RER - Replicate Error Ratio = (S-D)/[sqrt((sq(TPUs)+sq(TPUD)))] as defined by ICPT BOA  
rptSTLRchMS Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
V5.2.15 A2002

FORM II

Date: 15-Aug-11

MATRIX SPIKE DUPLICATE RESULTS

Lab Name: TestAmerica      SDG: J01187      Matrix: WATER  
 Lot-Sample No.: J1G260454-1, J1K7K2      Report No.: 47914

Parameter	SpikeResult, Orig Rst	Count Error (2 s)	Total Uncert(2 s)	MDC MDA	Rpt Unit, CRDL	Yield	Recovery	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 1207166	7196_CR6										
HEXCHROME	2.82E-01		0.0E+00	3.70E-03 mg/L		N/A	107.16%	2.63E-01	7/26/11 03:45 p	25.0	ML
	2.85E-01	RPD	1.1						MK6JE1DW		
Batch: 1207166	7196_CR6										
HEXCHROME	2.85E-01		0.0E+00	3.70E-03 mg/L		N/A	108.30%	2.63E-01	7/26/11 03:45 p	25.0	ML
	2.82E-01	RPD	1.1						MK6JE1CW		

No. of Results: 2      Comments:

TestAmerica      RER      - Replicate Error Ratio = (S-D)/[sqrt((TPUs)+sq(TPUd))] as defined by ICPT BOA.  
 rpt\$TLRchMsDup2      Bias      - (Result/Expected)-1 as defined by ANSI N13.30.  
 V5.2.15 A2002

Lot No., Due Date: J1G260454; 08/16/2011  
 Client, Site: 127642; S00X235B00 HANFORD  
 QC Batch No., Method Test: 1207161; RGAMMA Gamma by GER  
 SDG, Matrix: J01187; WATER

**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:  
Please see NCM # 10-18990

First Level *[Signature]* Date *8-15-11*



## Data Review Checklist

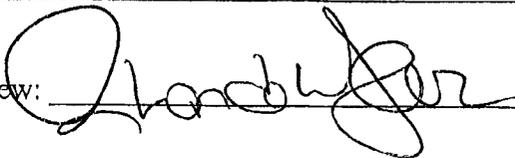
### RADIOCHEMISTRY

#### Second Level Review

Batch Number: 1207101

Review Item	Yes (✓)	No (✓)	NA (✓)
<b>A. Sample Analysis</b>			✓
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>B. QC Samples</b>			
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?	✓		
<b>C. Other</b>			
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 = 15.0 pCi/l  
See NCM # 10-18990

Second Level Review:  Date: 8/15/11

# Clouseau Nonconformance Memo



NCM #: <b>10-18990</b> NCM Initiated By: John Norton Date Opened: 08/15/2011 Date Closed:	Classification: <b>Anomaly</b> Status: <b>PMREVIEW</b> Production Area: Counting Tests: Gamma by GER Lot #'s (Sample #'s): J1G260000 (161), J1G260454 (1), QC Batches: 1207161,
Nonconformance: LCS result out of limits Subcategory: Analyte was recovered low in the LCS	

### Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
John Norton	08/15/2011	The Co-60 in the LCS showed a low yield of only 59%.

### Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
John Norton	08/15/2011	Due to the priority nature of the samples the data will be presented to the client, the Cs-137 amd Eu-152 which were added to the LCS provide acceptable yields.

### Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

### Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
			This section not yet completed by QA.

### Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
----------------------	--------------------	-----------------

Batch Number(s): 1207166				
Lab Sample Numbers or SDG: J01187				
Method/Test/Parameter: Cr+6 in Water / RL-WC-003				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>A. Initial Calibration</b>				
1. Performed at required frequency with required number of levels?	✓			/
2. Correlation coefficient within QC limits?	✓			/
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			/
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			/
<b>B. Continuing Calibration</b>				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			/
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			/
<b>C. Sample Analysis</b>				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?			✓	/
2. Were all sample holding times met?	✓			/
<b>D. QC Samples</b>				
1. All results for the preparation blank below limits?	✓			/
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	✓			/
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			/
4. Analytical spikes within QC limits where applicable?	✓			/
5. ICP only: One serial dilution performed per SDG?			✓	/
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	/
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	/

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
<b>E. Other</b>			✓	
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:

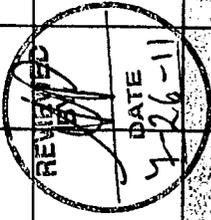
Analyst: H. R. [Signature]

Date: 07-27-11

Second-Level Review: [Signature]

Date: 7/28/11

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-192-006		Page 1 of 1	
Collector BC Koelling	Company Contact Joan Kessner	Telephone No. 375-4688	Project Coordinator KESNER, JH	Price Code 7L	Data Turnaround 21 Days				
Project Designation 100N Field Remediation - Water	Sampling Location 100-N-84-6	Field Lossbook No. EL-1652-2	COA R10N612000	Method of Shipment Hand Delivery	Bill of Lading/Air Bill No. NA				
Ice Chest No. NA	Offsite Property No. NA	Preservation HNO3 to pH < 2	Cool 4C G/P	Cool 4C aG	Cool 4C aG	Cool 4C G/P	None		
Shipped To TestAmerica Incorporated, Richland	POSSIBLE SAMPLE HAZARDS/REMARKS None	Type of Container G/P	1	1	1	1			
Special Handling and/or Storage Cool 4 Degrees C	Volume 20mL	No. of Container(s)	1	1	1	1			
SAMPLE ANALYSIS		See item (1) in Special Instructions (Hexavalent Chromium)	Chromium Hex - 7196	PCBs - 8082	See item (2) in Special Instructions	RCE GEA Shipping Scale			
Sample No.	Matrix *	Sample Date	Sample Time						
J1K7K2	WATER	7/26/11	0840						
CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time	(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc), Mercury - 7470 - (CV) (Mercury) (2) Gamma Spec (Client List) (Americium-241, Antimony-125, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Ruthenium-106, Zinc-65) (3) Not Preserved in the field Quote # 27023 SDG # J01187 WPT # J1G2000454 Report # 8/11/11		S-Seal SF-Sediment SO-Solid Sh-Sludge W - Water O-Oil A-Air DDr-Drum Solids DL-Drum Liquids T-Tissue Wj-Wipe L-Liquid V-Vegetation X-Other			
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						
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time						
LABORATORY SECTION	Received By	Title		Date/Time					
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time					



**Sample Check-in List**

Date/Time Received: 7/26/11 @ 12:15 GM Screen Result: (Airlock) 08 Initials HC  
(Sample Receiving) 03 Initials HC

Client: WCH SDG #: JD1187 NA [ ] SAF #: RC-192 NA [ ]

Lot Number: JIG260454

Chain of Custody # RC-192-006

Shipping Container ID: Hand delivered 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: 21.5 °C on - Joel
- 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): 1 Sample
- 7. Containers received: 1x 1L p; 1x 20mL p

8. Sample holding times exceeded? NA [ ] Yes [ ] No

9. Samples have:  
 tape hazard labels  
 custody seals appropriate sample labels

10. Matrix:  
 A (FLT, Wipe, Solid, Soil) HC (Water)  
 S (Air, Niosh 7400) HC T (Biological, Ni-63)

11. Samples:  
 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 [ ]  
 (If acidification is necessary, then document sample ID, initial pH, amount of HNO<sub>3</sub> added and pH after addition on table overleaf)

RPL ID # of preservative used: S-11-00125

13. Were any anomalies identified in sample receipt? Yes [ ] No

14. Description of anomalies (include sample numbers): NA



**Sample Preparation/Analysis**

Balance Id: 1117411003

7/27/2011 10:36:47 AM

AW Gamma Prp GAM001  
TA Gamma by HPGE  
51 CLIENT: HANFORD

127642, Washington Closure Hanford LLC  
Bechtel Hanford, Inc.

Analyte Due Date: 08/16/2011

Sep1 DT/Tm Tech:

PM, Quote: RW2, 27023

Batch: 1207161 WATER pCi/L

SEQ Batch, Test: None All Tests: 88EA, 1207161 AWTA, 1207166 88EA,

Prep Tech: ,BaughB

Sep2 DT/Tm Tech:

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

1 MK6JE-1-AA			503.30g, in	503.30g			503.30g	610	0 2 5 7	8/4/11 m	
J1G260454-1-SAMP											
07/26/2011 08:40											

2 MK6JE-1-AF-X											
J1G260454-1-DUP											
07/26/2011 08:40											

3 MK6KC-1-AA-B			504.00g, in	504.00g							
J1G260000-161-BLK											
07/27/2011 08:00 pd											

4 MK6KC-1-ACC			501.80g, in	501.80g	QCAG1758						
J1G260000-161-LCS					06/10/11, pd						
07/27/2011 08:00 pd					11/07/03, r						

Comments: PA-2.0. Please recount dup on different detector. BB 7/27/11.

All Clients for Batch: 127642, Washington Closure Hanford LLC Bechtel Hanford, Inc. , RW2, 27023

**MK6JE1AA-SAMP Constituent List:**

CO-58	RDL:--	pCi/L	LCL:	UCL:	RPD:	Co-60	RDL:25	pCi/L	LCL:	UCL:	RPD:
CS-137	RDL:15	pCi/L	LCL:70	UCL:130	RPD:20	CS-137DA	RDL:15	pCi/L	LCL:70	UCL:130	RPD:20
EU-152	RDL:50	pCi/L	LCL:--	UCL:--	RPD:--	EU-154	RDL:50	pCi/L	LCL:--	UCL:--	RPD:--
EU-155	RDL:50	pCi/L	LCL:--	UCL:--	RPD:--	FE-59	RDL:--	pCi/L	LCL:--	UCL:--	RPD:--

**MK6KC1AA-BLK:**

CO-58	RDL:--	pCi/L	LCL:	UCL:	RPD:	Co-60	RDL:25	pCi/L	LCL:	UCL:	RPD:

7/27/2011 10:36:48 AM

### Sample Preparation/Analysis

Balance Id:1117411003

AW Gamma Prp GAM001  
TA Gamma by HPGE  
5l CLIENT: HANFORD

Pipet #:

AnalyDueDate: 08/16/2011

Sep1 DT/Tm Tech:

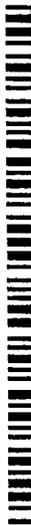
Batch: 1207161

pCi/L

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,BaughB



Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
CS-137	RDL:15	pCi/L	LCL: LCL: LCL:	RPD: RPD: RPD:	Cs-137DA	RDL:15	RDL:15	pCi/L	LCL: LCL: LCL:	UCL: UCL: UCL:	RPD: RPD: RPD:
Eu-152	RDL:50	pCi/L	LCL: LCL: LCL:	RPD: RPD: RPD:	Eu-154	RDL:50	RDL:50	pCi/L	LCL: LCL: LCL:	UCL: UCL: UCL:	RPD: RPD: RPD:
Eu-155	RDL:50	pCi/L	LCL: LCL: LCL:	RPD: RPD: RPD:	Fe-59	RDL:--	RDL:--	pCi/L	LCL: LCL: LCL:	UCL: UCL: UCL:	RPD: RPD: RPD:
<b>MK6KCLAC-LCS:</b>											
CS-137	RDL:15	pCi/L	LCL:70	RPD:20	Cs-137DA	RDL:15	RDL:15	pCi/L	LCL:70	UCL:130	RPD:20
K-40	RDL:6	pCi/L	LCL:70	RPD:20	RA-226	RDL:--	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20
RA-228	RDL:--	pCi/L	LCL:70	RPD:20	RA-228DA	RDL:--	RDL:--	pCi/L	LCL:70	UCL:130	RPD:20
U-238	RDL:--	pCi/L	LCL:70	RPD:20				pCi/L	LCL:70	UCL:130	RPD:20
<b>MK6JFLAA-SAMP Calc Info:</b>											
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
<b>MK6KCLAA-BLK:</b>											
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					
<b>MK6KCLAC-LCS:</b>											
Uncert Level (#s):	2	Decay to SaDt:	Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B					

8/15/2011 11:48:17 AM

# ICOC Fraction Transfer/Status Report

ByDate: 8/15/2010, 8/20/2011, Batch: '1207161', User: \*ALL Order By DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
1207161				
AC	Rev1C	BaughB	7/27/2011 10:24:12	
SC		loeberl	IsBatched	7/27/2011 8:39:32 AM
SC		BaughB	InPrep	7/27/2011 10:24:12 AM
SC		BaughB	Prep2C	7/27/2011 11:12:28 AM
SC		ClarkR	InCnt1	7/27/2011 11:28:03 AM
SC		BlackCL	CalcC	8/12/2011 8:09:39 AM
SC		nortonj	Rev1C	8/15/2011 11:47:51 AM
AC		BaughB	7/27/2011 11:12:28	ICOC_RADCALC v4.8.49
AC		ClarkR	7/27/2011 11:28:03	RL-PRP-004 REVISION 1
AC		BlackCL	8/12/2011 8:09:39	RL-GAM-001 REVISION 1
AC		nortonj	8/15/2011 11:47:51	RL-CI-007 REVISION 1
				RL-DR-001 Rev 2

AC: Accepting Entry; SC: Status Change

TestAmerica Richland  
Richland Wa.

7/26/2011 4:05:48 PM

### Sample Preparation/Analysis

Balance Id:  
Pipet #:

127642, Washington Closure Hanford LLC  
Bechtel Hanford, Inc.

88 NO SAMPLE PREPARATION PERFORMED / DIRECT INJECTION  
EA Chromium, Hexavalent (7196A)  
5I CLIENT: HANFORD

AnalyteDueDate: 08/16/2011

Sep1 DT/Tm Tech:

Batch: 1207166 WATER mg/L  
SEQ Batch, Test: None

PM, Quote: RW2, 27023

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 MK6JE-1-AC J1G260454-1-SAMP 07/26/2011 08:40								
2 MK6JE-1-AH-X J1G260454-1-DUP 07/26/2011 08:40								
3 MK6JE-1-AJ-S J1G260454-1-MSD 07/26/2011 08:40								
4 MK6JE-1-AK-D J1G260454-1-MSD 07/26/2011 08:40								
5 MK6LG-1-AA-B J1G260000-166-BLK 07/26/2011 15:39 pd								
6 MK6LG-1-AC-C J1G260000-166-LCS 07/26/2011 15:39 pd								



## ANALYTICAL REPORT

Job Number: 280-18486-1

SDG Number: J01187

Job Description: SAF# RC-192

For:

Washington Closure Hanford  
2620 Fermi Avenue  
Richland, WA 99354

Attention: Joan H Kessner



A handwritten signature in black ink that reads "Kae E. Yoder".

Approved for release.  
Kae E Yoder  
Project Manager II  
8/17/2011 12:14 PM

---

Kae E Yoder  
Project Manager II  
kae.yoder@testamericainc.com  
08/17/2011

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.

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## CASE NARRATIVE

Client: Washington Closure Hanford

Project: WASHINGTON CLOSURE HANFORD

Report Number: 280-18486-1

SDG #: J01187

SAF#: RC-192

Date SDG Closed: July 27, 2011

Data Deliverable: 21 Day / Summary

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>ANALYSES REQUESTED</u>	<u>ANALYSES PERFORMED</u>
J1K7K2	280-18486-1	6010/7470/8310/8082	6010B/6020/7470A/8310/8082

*The Uranium method substitution noted above, as agreed to by all parties, has no technical impact on the data.*

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.

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 7/27/2011; the sample arrived intact and on ice. The temperature of the cooler at receipt was 4.7 C.

The ICP Metals and Mercury volume for sample J1K7K2 was received at the laboratory improperly preserved. The laboratory adjusted the pH of the sample and proceeded with the requested analyses. The client was notified on 7/28/2011.

### GC SEMIVOLATILES - SW846 8082 - PCBs

The method required MS/MSD could not be performed for batch 280-78717, due to insufficient sample volume submitted by the client. A duplicate LCS (LCSD) was analyzed to provide some evidence of batch precision.

No other anomalies were encountered.

### HPLC - SW846 8310 - PAHs

The RPD between the primary and confirmation columns exceeded 40% for Benzo[a]pyrene in sample J1K7K2. The lower of the two values have been reported, as matrix interference is evident. The result has been flagged with an "X".

The LCSD aliquot of the LCS/LCSD associated with batch 280-78709 exhibited the percent recovery outside the control limits, biased high, for Indeno[1,2,3-cd]pyrene, and the associated sample result has been flagged "N". This is an indicator that data may be biased high. As no detectable concentrations of Indeno[1,2,3-cd]pyrene are present in the associated sample, corrective action is deemed unnecessary.

The method required MS/MSD could not be performed for batch 280-78709, due to insufficient sample volume submitted by the client. A duplicate LCS (LCSD) was analyzed to provide some evidence of batch precision.

No other anomalies were encountered.

### TOTAL METALS - SW846 6010B/6020/7470A

Low levels of Manganese, Potassium and Sodium are present in the method blank associated with batch 280-78745. Because the concentrations in the method blank are not present at levels greater than half the reporting limit or the associated sample amounts are twenty times greater than the method blank concentration, corrective action is deemed unnecessary.

Low levels of Copper are present at a level greater than half the reporting limit in the method blank associated with batch 280-78745. As Copper is not present at a level greater than the reporting limit in the associated sample, corrective action is deemed unnecessary.

Silicon was recovered outside the control limits, biased low, in the LCS and LCSD associated with batch 280-78745, and the associated sample result has been flagged "N". Due to insufficient sample volume submitted by the client, corrective action could not be initiated and data are reported as is. The client was notified on 8/8/2011.

Due to insufficient sample volume submitted by the client, the Matrix Spike and Sample Duplicate analysis for SW846 6010B batch 280-78745, SW846 6020 batch 280-78742 and SW846 7470A batch 280-78616 could not be performed. Duplicate LCS (LCSD) were analyzed to provide some evidence of batch precision.

No other anomalies were encountered.

## DATA REPORTING QUALIFIERS

Client: Washington Closure Hanford

Job Number: 280-18486-1  
Sdg Number: J01187

Lab Section	Qualifier	Description
GC Semi VOA	U	Analyzed for but not detected.
Metals	U	Analyzed for but not detected.
	B	Estimated result. Result is less than the RL, but greater than MDL
	N	Recovery exceeds upper or lower control limits
	C	The analyte was detected in both the sample and the associated QC blank, and the sample concentration was $\leq$ 5X the blank concentration.
HPLC/IC	B	Analyte was found in the associated method blank as well as in the sample.
	U	Analyzed for but not detected.
	N	LCS, LCSD: Recovery exceeds upper or lower control limits.
	X	More than 40% difference between columns, lower result reported.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.