

July 22, 2015

Analytical Data Package Prepared For  
**CH2M Hill Plateau Remediation**

Radiochemical Analysis By  
**TestAmerica Inc**

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

Assigned Laboratory Code: TARL

Data Package Contains 16 Pages

Report No.: 66567

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.
W07177	F15-040	B31F76	J5G080413-1	M67001AC	9M670010	5191059
		B31F76	J5G080413-1	M67001AA	9M670010	5191060
		B31F76	J5G080413-1	M67001AD	9M670010	5191061

July 22, 2015



## Certificate of Analysis

CH2M Hill Plateau Remediation Company  
P.O. Box 1600  
Mail Stop – R3-60  
Richland, WA 99352

July 22, 2015

Attention: Scot Fitzgerald

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SAF Number	:	F15-040
Date SDG Closed	:	July 7, 2015
Number of Samples	:	One (1)
Sample Type	:	Water
SDG Number	:	W07177
Data Deliverable	:	30-Day / Summary

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### CASE NARRATIVE

#### **I. Introduction**

On July 7, 2015, one sample was received at TestAmerica (TARL). Upon receipt, the sample was assigned laboratory ID numbers to correspond with the CH2M specific IDs.

#### **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**

Iodine-129 (LL) by method RL-GAM-002

##### **Liquid Scintillation Counting**

Technetium-99 by TEVA method RL-LSC-014

Tritium by method RL-LSC-005

CH2M Hill Plateau Remediation Company  
July 22, 2015

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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**

Iodine-129 (LL) by method RL-GAM-002:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

**Liquid Scintillation Counting**

Technetium-99 by TEVA method RL-LSC-014:

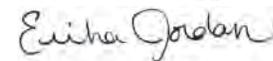
No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

Tritium by method RL-LSC-005:

No analytical or quality issues were noted. The sample results and associated batch QC results are within contractual requirements.

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

Reviewed and approved **Erika Jordan**

 2015.07.22

For \_\_\_\_\_ 15:07:15 -07'00'

Whitney Ritari  
Project Manager

July 22, 2015

## SAMPLE ISSUE RESOLUTION

SIR NUM	SIR15-386
REV NUM	0
DATE INITIATED	7/23/2015

### SAMPLE EVENT INFORMATION

SAF NUM(S)	F15-040
OPERABLE UNIT(S)	200-UP-1
PROJECT(S)	CPP 200 Area
SAMPLE EVENT TITLE(S)	200-UP-1 Waste Designation
LABORATORY	TestAmerica Incorporated, Richland

### SAMPLING INFORMATION

NUMBER OF SAMPLES	1
SAMPLE NUMBERS	B31F76
SAMPLE MATRIX	WATER
COLLECTION DATE	7/7/2015 - 7/7/2015
SDG NUM	W07177

### ISSUE BACKGROUND

CLASS	Chain of Custody Issue (Field)
TYPE	No Unit Type Noted For Sample Depths
DESCRIPTION	COC #F15-040-009, SAMPLE B31F76. NO UNITS FOR SAMPLE DEPTH.

### DISPOSITION

DESCRIPTION	DOCUMENT AND CLOSE
JUSTIFICATION	DOCUMENT AND CLOSE

SUBMITTED BY: Gayelyn Gibson DATE: 07/13/2015  
ACCEPTED BY: Kirsten Killand DATE: 07/23/2015

**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>CSU (#s) <i>u<sub>c</sub> Combined Standard Uncert.</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 standard 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.

July 22, 2015

J5G080413  
607177

**CH2M Hill Plateau Remediation Company**

**COLLECTOR**  
E.L. Kamber/CHPRC

**SAMPLING LOCATION**  
C-9482, I-007

**CE CHEST NO.**  
N/A

**SHIPPED TO**  
TestAmerica Incorporated, Richland

**COMPANY CONTACT**  
TODAK, D

**TELEPHONE NO.**  
376-6427

**PROJECT DESIGNATION**  
200-UP-1 Iodine-129 Wells - Water Sampling

**FIELD LOGBOOK NO.**  
HUF-N-507 29 P. 93

**ACTUAL SAMPLE DEPTH**  
392

**OFFSITE PROPERTY NO.**  
N/A

**PROJECT COORDINATOR**  
TODAK, D

**SAF NO.**  
FL5-040

**COA**  
303589

**BILL OF LADING/AIR BILL NO.**  
N/A

**PRICE CODE**  
7H

**AIR QUALITY**

**METHOD OF SHIPMENT**  
GOVERNMENT VEHICLE

**PAGE 1 OF 1**

**DATA TURNAROUND**  
30 Days / 30 Days

**ORIGINAL**



M6700

MATRIX*	PRESERVATION	None	HCl to pH <2	None
DL=Drum	6 Months	6 Months	6 Months	6 Months
DS=Drum	G/P	G/P	P	P
L=Liquid	2	1	1	1
O=Oil	4L	500ml	1L	1L
S=Soil	1L29_SEP_LEPS	TC99_ETVDSK	LSC: COMMON;	TRITIUM_DIST
SE=Sediment	LSC: COMMON;	LSC: COMMON;	LSC: COMMON;	LSC: COMMON;
T=Tissue				
V=Vegetation				
W=Water				
WT=Wipe				
X=Other				
<b>SAMPLE NO.</b>	<b>MATRIX*</b>	<b>SAMPLE DATE</b>	<b>SAMPLE TIME</b>	
Q31F76	WATER	7-7-15	1038	

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

**SPECIAL INSTRUCTIONS**  
TRVL-15-083

**TRVL-15-083**

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM E.L. Kamber/CHPRC	RECEIVED BY/STORED IN F.M. HAMBURGER	DATE/TIME JUL 07 2015	DATE/TIME JUL 07 2015
RELINQUISHED BY/REMOVED FROM F.M. HAMBURGER	RECEIVED BY/STORED IN J. Friesz, TARL	DATE/TIME JUL 07 2015	DATE/TIME JUL 07 2015
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	DATE/TIME	DATE/TIME
LABORATORY SECTION	RECEIVED BY		DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DATE/TIME

PRINTED ON 5/6/2015

A-6003-618 (REV 2)

1 of 17

Date/Time Received: 7/7/15 1445 Container GM Screen Result: (Airlock) 20 cpm Initials [ J ]  
Sample GM Screen Result (Sample Receiving) 20 cpm Initials [ J ]

Client: FLH SDG #: W07177 SAF #: F15-040 NA [ ]

Lot Number: J5G080413

Chain of Custody # F15-040-009

Shipping Container ID or Air Bill Number : \_\_\_\_\_ NA [ J ]

Samples received inside shipping container/cooler/box Yes [ J ] 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 [ J ]
- 2. Custody Seals dated and signed? Yes [ ] No [ ] No Custody Seal [ J ]
- 3. Cooler temperature: 5.6°C ON ICE NA [ ]
- 4. Vermiculite/packing materials is NA [ J ] Wet [ ] Dry [ ]

Item 5 through 16 for samples. Initial appropriate response.

- 5. Chain of Custody record present? Yes [ J ] No [ ]
- 6. Number of samples received (Each sample may contain multiple bottles): 1
- 7. Containers received: 1x500ml p/1x1p, 2x4lp

- 8. Sample holding times exceeded? NA [ ] Yes [ ] No [ J ]
- 9. Samples have: \_\_\_\_\_ tape \_\_\_\_\_ hazard labels J custody seals F appropriate sample labels
- 10. Matrix: \_\_\_\_\_ A (FLT, Wipe, Solid, Soil) J I (Water) \_\_\_\_\_ S (Air, Niosh 7400) \_\_\_\_\_ T (Biological, Ni-63)

11. Samples: J 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 [ J ] No [ ] NA [ ]  
(If acidification is necessary go to pH area & document sample ID, initial pH, amount of HNO<sub>3</sub> added and pH after addition on table)

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

14. Description of anomalies (include sample numbers): NA [ J ] \_\_\_\_\_

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

16. Additional Information: N/A

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

Sample Check-in List completed by Sample Custodian:  
Signature: \_\_\_\_\_ Date: 7/7/15

Client Notification needed? Yes [ ] No [ J ] Date: \_\_\_\_\_  
By: \_\_\_\_\_  
Person contacted: \_\_\_\_\_

WMP No action necessary; process as is  
Project Manager: Whitney M. Litari Date: 7/9/15

July 22, 2015

Sample Results Summary

Date: 22-Jul-15

TestAmerica Inc TARL

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

Report No. : 66567

SDG No: W07177

Batch	Client Id Work Order	Parameter	Result +- CSU ( 2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
5191059	I129LL_SEP_LEPS_GS								
	<b>B31F76</b>								
	M67001AC	I129	6.24E-01 +- 4.6E-01	U	pCi/L	76%	6.41E-01	1.00E+00	
	<b>B31T29 DUP</b>								
	M67J31AE	I129	4.34E-01 +- 3.1E-01	U	pCi/L	81%	6.61E-01	1.00E+00	72.6
5191060	TRITIUM_DIST_LSC								
	<b>B31F76</b>								
	M67001AA	H-3	2.31E+04 +- 8.6E+02		pCi/L	100%	2.89E+02	4.00E+02	
	<b>B31T29 DUP</b>								
	M67J31AF	H-3	6.35E+03 +- 3.5E+02		pCi/L	100%	2.88E+02	4.00E+02	2.1
5191061	TC99_ETVDSK_LSC								
	<b>B31F76</b>								
	M67001AD	Tc-99	4.59E+01 +- 5.6E+00		pCi/L	100%	9.46E+00	1.50E+01	
	<b>B31RW9 DUP</b>								
	M67JW1AC	Tc-99	7.14E+02 +- 2.3E+01		pCi/L	100%	9.11E+00	1.50E+01	5.4
	No. of Results: 6								

TestAmerica Inc  
rptTALRchSaSummary2 V5.3.8  
A2002

RPD - Relative Percent Difference.  
U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

July 22, 2015

QC Results Summary  
TestAmerica Inc TARL  
Ordered by Method, Batch No, QC Type,.

Date: 22-Jul-15

Report No. : 66567

SDG No.: W07177

Batch	Work Order	Parameter	Result +- CSU ( 2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
<b>I129LL_SEP_LEPS_GS</b>									
5191059	BLANK QC,								
	M685X1AA	I129	-2.55E-01 +- 3.1E-01	U	pCi/L	85%			5.01E-01
5191059	LCS,								
	M685X1AC	I129	2.11E+01 +- 2.7E+00		pCi/L	89%	110%	0.1	6.72E-01
<b>TRITIUM_DIST_LSC</b>									
5191060	MATRIX SPIKE, B31RW6								
	M67J41AE	H-3	1.17E+03 +- 5.4E+02		pCi/L	100%	84%	-0.2	3.36E+02
5191060	BLANK QC,								
	M68501AA	H-3	9.64E+01 +- 1.3E+02	U	pCi/L	100%			2.98E+02
5191060	LCS,								
	M68501AC	H-3	2.62E+03 +- 2.3E+02		pCi/L	100%	94%	-0.1	3.00E+02
<b>TC99_ETVDSK_LSC</b>									
5191061	MATRIX SPIKE, B31RX2								
	M67JX1AC	Tc-99	4.69E+02 +- 2.2E+01		pCi/L	100%	89%	-0.1	9.25E+00
5191061	BLANK QC,								
	M68511AA	Tc-99	1.55E-01 +- 2.6E+00	U	pCi/L	100%			5.97E+00
5191061	LCS,								
	M68511AC	Tc-99	5.98E+01 +- 4.4E+00		pCi/L	100%	89%	-0.1	5.91E+00
<b>No. of Results: 8</b>									

TestAmerica Inc Bias - (Result/Expected)-1 as defined by ANSI N13.30.  
 rptSTLRchQcSummary V5.3.8 A2002 U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

**FORM I**

Date: 22-Jul-15

**SAMPLE RESULTS**

Lab Name: TestAmerica Inc  
 Lot-Sample No.: J5G080413-1  
 Client Sample ID: B31F76  
 SDG: W07177  
 Report No.: 66567  
 COC No.: F15-040-009  
 Matrix: WATER

Collection Date: 7/7/2000 10:38:00 AM  
 Received Date: 7/7/2015 2:45:00 PM

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	CSU (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
<b>Batch: 5191059</b> 1129LL_SEP_LEPS_GS <b>Work Order: M67001AC</b> <b>Report DB ID: 9M670010</b>												
1129	6.24E-01	U	4.6E-01	4.6E-01	6.41E-01	pCi/L	76%	0.97	7/20/15 06:44 p		2.0277	LEP5\$1
							1.00E+00	(2.7)			L	
<b>Batch: 5191060</b> TRITIUM_DIST_LSC <b>Work Order: M67001AA</b> <b>Report DB ID: 9M670010</b>												
H-3	2.31E+04		5.0E+02	8.6E+02	2.89E+02	pCi/L	100%	(80.1)	7/18/15 11:01 a		0.005	LSC8
							4.00E+02	(54.1)			L	
<b>Batch: 5191061</b> TC99_ETVDSK_LSC <b>Work Order: M67001AD</b> <b>Report DB ID: 9M670010</b>												
Tc-99	4.59E+01		5.3E+00	5.6E+00	9.46E+00	pCi/L	100%	(4.8)	7/16/15 01:05 p		0.1267	LSC8
							1.50E+01	(16.2)			L	

No. of Results: 3  
 Comments:

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TestAmerica Inc MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 rptSTLRLchSample U Qual - Analyzed for but not detected above limiting criteria, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.  
 V5.3.8 A2002

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**FORM II**

Date: 22-Jul-15

**DUPLICATE RESULTS**

Lab Name: TestAmerica Inc  
 Lot-Sample No.: J5G070404-1  
 Client Sample ID: B31RW9 DUP

SDG: W07173  
 Report No.: 66567  
 COC No.: F15-005-237

Collection Date: 7/6/2015 10:00:00 AM  
 Received Date: 7/6/2015 2:30:00 PM  
 Matrix: WATER

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	CSU ( 2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5191061	TC99_ETVDSK_LSC											
Tc-99	7.14E+02		1.5E+01	2.3E+01	9.11E+00	pCi/L	100%	(78.3)	7/15/15 10:38 p		0.1296	LSC8
	6.76E+02		RPD 5.4			1.50E+01		(62.6)	Orig Sa DB ID: 9M67JW10		L	

No. of Results: 1    Comments:

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TestAmerica Inc    RPD    - Relative Percent Difference.  
 rptSTLRchDupV5.    MDC(MDA).Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.  
 3.8 A2002

**FORM II**

Date: 22-Jul-15

**DUPLICATE RESULTS**

**Lab Name:** TestAmerica Inc **SDG:** W07173 **Collection Date:** 7/6/2015 9:45:00 AM  
**Lot-Sample No.:** J5G070404-5 **Report No.:** 66567 **Received Date:** 7/6/2015 2:30:00 PM  
**Client Sample ID:** B31T29 DUP **COC No.:** F15-005-243 **Matrix:** WATER

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	CSU ( 2 s)	MDL, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 5191059	1129LL_SEP_LEPS_GS											
1129	4.34E-01	U	3.1E-01	3.1E-01	6.61E-01	pCi/L	81%	0.66	7/20/15 09:35 a	9M67J310	2.0292	LEP5\$1
	9.29E-01		RPD 72.6			1.00E+00	(2.8)				L	
Batch: 5191060	TRITIUM_DIST_LSC											
H-3	6.35E+03		2.8E+02	3.5E+02	2.88E+02	pCi/L	100%	(22.1)	7/17/15 09:20 p	9M67J310	0.005	LSC8
	6.49E+03		RPD 2.1			4.00E+02	(36.4)				L	

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No. of Results: 2    Comments:

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**TestAmerica Inc 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, Mdc/Mda/Mdl, Total Uncert, RDL or not identified by gamma scan software.

**FORM II  
BLANK RESULTS**

Date: 22-Jul-15

Lab Name: **TestAmerica Inc**      SDG: **W07177**  
 Matrix: **WATER**      Report No.: **66567**

Parameter	Result	Qual	Count Error ( 2 s)	CSU (2 s)	MDL, Lc	Rpt Unit, CRDL	Yield	Rst/MDL, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
<b>Batch: 5191060</b> TRITIUM_DIST_LSC <b>Work Order: M68501AA</b> <b>Report DB ID: M68501AB</b>												
H-3	9.64E+01	U	1.2E+02	1.3E+02	2.98E+02	pCi/L	100%	0.32	7/18/15 12:23 p	0.00501	L	LSC8
					1.42E+02	4.00E+02		(1.4)				
<b>Batch: 5191059</b> I129LL_SEP_LEPS_GS <b>Work Order: M685X1AA</b> <b>Report DB ID: M685X1AB</b>												
I129	-2.55E-01	U	3.1E-01	3.1E-01	5.01E-01	pCi/L	85%	-0.51	7/20/15 08:43 p	2.0346	L	LEP4\$1
					2.15E-01	1.00E+00		-(1.6)				
<b>Batch: 5191061</b> TC99_ETVDSK_LSC <b>Work Order: M68511AA</b> <b>Report DB ID: M68511AB</b>												
Tc-99	1.55E-01	U	2.5E+00	2.6E+00	5.97E+00	pCi/L	100%	0.03	7/16/15 02:07 p	0.201	L	LSC8
					2.86E+00	1.50E+01		0.12				

No. of Results: 3      Comments:

July 22, 2015

**FORM II**  
**LCS RESULTS**

Date: 22-Jul-15

Lab Name: TestAmerica Inc

SDG: W07177

Matrix: WATER

Report No. : 66567

Parameter	Result	Qual	Count Error ( 2 s)	CSU ( 2 s)	MDL	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
<b>Batch: 5191060</b>													
	TRITIUM_DIST_LSC			Work Order: M68501AC			Report DB ID: M68501CS						
H-3	2.62E+03		2.1E+02	2.3E+02	3.00E+02	pCi/L	100%	2.78E+03	8.34E+01	94%	7/18/15 01:45 p	0.00501	LSC8
							Rec Limits:	70	130	-0.1		L	
<b>Batch: 5191059</b>													
	1129LL_SEP_LEPS_GS			Work Order: M685X1AC			Report DB ID: M685X1CS						
1129	2.11E+01		2.7E+00	2.7E+00	6.72E-01	pCi/L	89%	1.93E+01	2.08E-01	110%	7/20/15 08:44 p	2.0099	LEP5\$1
							Rec Limits:	70	130	0.1		L	
<b>Batch: 5191061</b>													
	TC99_ETVDSK_LSC			Work Order: M68511AC			Report DB ID: M68511CS						
Tc-99	5.98E+01		4.1E+00	4.4E+00	5.91E+00	pCi/L	100%	6.72E+01	6.99E-01	89%	7/16/15 03:09 p	0.2016	LSC8
							Rec Limits:	70	130	-0.1		L	

July 22, 2015

No. of Results: 3      Comments:

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**FORM II**

Date: 22-Jul-15

**MATRIX SPIKE RESULTS**

Lab Name: TestAmerica Inc      SDG: W07173      Matrix: WATER  
 Lot-Sample No.: J5G070404-2, B31RX2      Report No.: 66567

Parameter	SpikeResult, Orig Rst	Count Error (2 s)	CSU (2 s)	MDC MDA	Rpt Unit	Yield	Recovery	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 5191061	Work Order: M67JX1AC	Report DB ID: M67JX1CW	Report DB ID: M67JX1CW			Orig Sa DB ID: 9M67JX10					
Tc-99	4.69E+02	1.4E+01	2.2E+01	9.25E+00	pCi/L	100%	88.97%	5.27E+02	7/16/15 12:42 a	0.1292	TC99_ETVDSK_LSC
	1.56E+02							5.43E+00		L	LSC8

Number of Results: 1

Comments:

July 22, 2015

**FORM II**

Date: 22-Jul-15

**MATRIX SPIKE RESULTS**

Lab Name: TestAmerica Inc      SDG: W07173      Matrix: WATER  
 Lot-Sample No.: J5G070404-6, B31RW6      Report No.: 66567

Parameter	SpikeResult, Orig Rst	Count Error (2 s)	CSU (2 s)	MDC MDA	Rpt Unit	Yield	Recovery	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 5191060	Work Order: M67J41AE	Report DB ID: M67J41EW	Report DB ID: M67J41EW			Orig Sa DB ID: 9M67J410					
H-3	1.17E+03	3.3E+02	5.4E+02	3.36E+02	pCi/L	100%	84.42%	1.39E+03	7/18/15 12:04 a	0.00434	TRITIUM_DIST_LSC
	6.39E+03							4.16E+01		L	LSC8

Number of Results: 1

Comments:

July 22, 2015

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TestAmerica Inc      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.  
 V5.3.8 A2002