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 19 *Pages*

Report No.: 68590

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.
W07457	F16-020	B352X3	J6D250418-1	M8JNQ1AC	9M8JNQ10	6117032
		B352X3	J6D250418-1	M8JNQ1AA	9M8JNQ10	6117033
		B352X5	J6D250418-2	M8JNR1AC	9M8JNR10	6117032
		B352X5	J6D250418-2	M8JNR1AA	9M8JNR10	6117033
		B352X7	J6D250418-3	M8JNT1AC	9M8JNT10	6117032
		B352X7	J6D250418-3	M8JNT1AA	9M8JNT10	6117033

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Certificate of Analysis

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

May 13, 2016

Attention: Scot Fitzgerald

SAF Number	:	F16-020
Date SDG Closed	:	April 25, 2016
Number of Samples	:	Three (3)
Sample Type	:	Soil
SDG Number	:	W07457
Data Deliverable	:	30-Day / Summary

CASE NARRATIVE

I. Introduction

On April 25, 2016, three soil samples were 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:

Alpha Spectroscopy
Uranium 234, 235 and 238 by method RL-ALP-015

Liquid Scintillation Counting
Technetium-99 by TEVA method RL-LSC-014

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.

The analytical results are reported on a dry weight basis.

QC and sample results are reported in the same units.

V. Comments

Alpha Spectroscopy
Uranium 234, 235 and 238 by method RL-ALP-015:
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.

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:

Digitally signed by Steven Campbell
Date: 2016.05.13 10:02:25 -07'00'

Steven Campbell
Project Manager Assistant

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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.
CSU (#s) ***u_c Combined Standard Uncert.***	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 standard 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.

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-020-209	PAGE 1 OF 1
COLLECTOR Antonio Jaimes	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9549, Core 24, B34161	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites Phase 3 Sampling		SAF NO. F16-020	AIR QUALITY ☐	30 Days / 30 Days
ICE CHEST NO. N/A	FIELD LOGBOOK NO. N/A	ACTUAL SAMPLE DEPTH 156.6 - 157.6	COA 302914	METHOD OF SHIPMENT ~~GOVERNMENT VEHICLE~~ AJ 4-25-16	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A			BILL OF LADING/AIR BILL NO. Company Vehicle N/A	

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	None
HOLDING TIME	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	60mL	60mL
SAMPLE ANALYSIS	TC99_ETVDSK_LSC: COMMON;	UISO_PLATE_AEA: COMMON;

J6D250418
W07457
Due 5.10.16

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B352X3	SOIL	4/25/16	1251	X	X

m8JNQ

J6D250418

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Antonio Jaimes	4-25-16/1550	J. Bock, TARL	4-25-16/1550
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
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 B352X3
Sample From HEIS #: ~~B352X4~~ AJ Actual Aliquot Collection
Depth: 156.6-157.6 4/25/16

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 3/17/2016 FSR ID = FSR26370 TRVL NUM = TRVL16-114 A-6003-618 (REV. 2)

May 13, 2016

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-020-211	PAGE 1 OF 1
COLLECTOR Antonio Jaimes	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H AIR QUALITY ☐	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9549, Core 30, B34173	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites Phase 3 Sampling		SAF NO. F16-020		
ICE CHEST NO. N/A	FIELD LOGBOOK NO. N/A	ACTUAL SAMPLE DEPTH 186.8 - 187.8	COA 302914	METHOD OF SHIPMENT AJ ~~GOVERNMENT VEHICLE~~ 4/25/16	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A			BILL OF LADING/AIR BILL NO. Company vehicle	

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	None	None
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA	HOLDING TIME	6 Months	6 Months
		TYPE OF CONTAINER	G/P	G/P
		NO. OF CONTAINER(S)	1	1
		VOLUME	60mL	60mL
	SPECIAL HANDLING AND/OR STORAGE N/A	SAMPLE ANALYSIS	TC99_ETVDSK_LSC: COMMON;	UISO_PLATE_AEA: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B352X5	SOIL	4/25/16	1008	X	X

JL0250418
W07457
M8JNR

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May 13, 2016

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Antonio Jaimes	4-25-16 1550	J. Bock, TARL	4-25-16 1550
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
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 B352X5
Sample From HEIS #: ~~B352X6~~ AJ Actual Aliquot Collection Depth: 186.8 - 187.8 4/25/16

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-020-213	PAGE 1 OF 1
COLLECTOR Antonio Jaimes	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H AIR QUALITY ☐	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9549, Core 32, B34H95	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites Phase 3 Sampling		SAF NO. F16-020		
ICE CHEST NO. N/A	FIELD LOGBOOK NO. N/A	ACTUAL SAMPLE DEPTH 197.9 - 199.2	COA 302914	METHOD OF SHIPMENT ~~GOVERNMENT VEHICLE~~ AJ	ORIGINAL
SHIPPED TO TestAmerica Incorporated, Richland	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A	Company Vehicle 4-25-16	

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	None
HOLDING TIME	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P
NO. OF CONTAINER(S)	1	1
VOLUME	60mL	60mL
SAMPLE ANALYSIS	TC99_ETVDSK_LSC: COMMON;	UISO_PLATE_AEA: COMMON;

JL6D250411✓
W0745N

M8JNT

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B352X7	SOIL	4-25-16	1403	X	X

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CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Antonio Jaimes Antonio Jaimes	4-25-16/1550	J. Bock, TARL	4-25-16/1550
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
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
Sample From HEIS #: B352X7 Actual Aliquot Collection
Depth: ~~197.2~~ 197.9 - 199.2
AJ 4-25-16

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 3/17/2016 FSR ID = FSR26372 TRVL NUM = TRVL16-114 A-6003-618 (REV. 2)

May 13, 2016

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Sample Check-in List

Date/Time Received: 4-25-16 | 1550 Container GM Screen Result: (Airlock) 0 cpm Initials [ ]
Sample GM Screen Result (Sample Receiving) 0 cpm Initials [ ]

Client: FLH SDG #: WD7457 SAF #: F16-020 NA [ ]

Lot Number: J6D250418

Chain of Custody # F16-020-209, 211, 213

Shipping Container ID or 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: _____ °C 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): 3
7. Containers received: 6 x 60mL
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) ____ I (Water) ____ S (Air, Niosh 7400) ____ 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 go to pH area & document sample ID, initial pH, amount of HNO_3 added and pH after addition on table)
13. Were any anomalies identified in sample receipt? Yes [ ] No [ ]
14. Description of anomalies (include sample numbers): NA [ ] _____
15. Sample Location, Sample Collector Listed on COC? * Yes [ ] No [ ]
    *For documentation only. No corrective action needed.
16. Additional Information: N/A

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

Sample Check-in List completed by Sample Custodian:
Signature: _____ Date: 4-25-16

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

[ ] No action necessary; process as is

Project Manager _____ Date 4-25-16

Sample Results Summary

TestAmerica Inc TARL

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

Date: 13-May-16

Report No. : 68590

SDG No: W07457

Batch	Client Id Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	MDL	CRDL	RPD
6117032 TC99_ETVDSK_LSC									
B352X3									
	M8JNQ1AC	Tc-99	1.19E+02 +- 3.1E+00		pCi/g	100%	6.20E-01	5.00E+00	
B352X5									
	M8JNR1AC	Tc-99	5.53E+01 +- 1.6E+00		pCi/g	100%	6.01E-01	5.00E+00	
B352X5 DUP									
	M8JNR1AD	Tc-99	6.05E+01 +- 1.8E+00		pCi/g	100%	6.05E-01	5.00E+00	9.1
B352X7									
	M8JNT1AC	Tc-99	8.23E+01 +- 2.3E+00		pCi/g	100%	6.02E-01	5.00E+00	
6117033 UISO_IE_PLATE_AEA									
B352X3									
	M8JNQ1AA	U-234	2.51E-01 +- 1.3E-01		pCi/g	87%	6.73E-02	1.00E+00	
		U-235	-3.60E-03 +- 3.0E-02	U	pCi/g	87%	6.54E-02	1.00E+00	
		U-238	1.91E-01 +- 1.1E-01		pCi/g	87%	6.73E-02	1.00E+00	
B352X3 DUP									
	M8JNQ1AD	U-234	2.05E-01 +- 1.2E-01		pCi/g	76%	8.25E-02	1.00E+00	20.2
		U-235	-5.25E-03 +- 3.3E-02	U	pCi/g	76%	7.55E-02	1.00E+00	-37.1
		U-238	1.91E-01 +- 1.2E-01		pCi/g	76%	7.55E-02	1.00E+00	0.1
B352X5									
	M8JNR1AA	U-234	8.73E-02 +- 7.3E-02		pCi/g	91%	4.92E-02	1.00E+00	
		U-235	-1.16E-03 +- 2.9E-02	U	pCi/g	91%	5.33E-02	1.00E+00	
		U-238	3.17E-01 +- 1.5E-01		pCi/g	91%	6.13E-02	1.00E+00	
B352X7									
	M8JNT1AA	U-234	1.55E-01 +- 9.8E-02		pCi/g	89%	4.78E-02	1.00E+00	
		U-235	1.36E-02 +- 2.8E-02	U	pCi/g	89%	4.78E-02	1.00E+00	
		U-238	1.13E-01 +- 8.2E-02		pCi/g	89%	4.78E-02	1.00E+00	

No. of Results: 16

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.

QC Results Summary
TestAmerica Inc TARL

Ordered by Method, Batch No, QC Type,.

Date: 13-May-16

Report No. : 68590

SDG No.: W07457

Batch Work Order	Parameter	Result +- CSU (2 s)	Qual	Units	Tracer Yield	LCS Recovery	Bias	MDL
TC99_ETVDSK_LSC								
6117032 MATRIX SPIKE, B352X7								
M8JNT1AD	Tc-99	2.09E+02 +- 7.4E+00		pCi/g	100%	96%	0.0	5.93E-01
6117032 BLANK QC,								
M8JX51AA	Tc-99	-8.49E-02 +- 2.8E-01	U	pCi/g	100%			6.14E-01
6117032 LCS,								
M8JX51AC	Tc-99	3.07E+01 +- 1.1E+00		pCi/g	100%	94%	-0.1	5.89E-01
UISO_IE_PLATE_AEA								
6117033 BLANK QC,								
M8JX61AA	U-234	4.46E-02 +- 8.2E-02	U	pCi/g	39%			1.41E-01
	U-235	-9.16E-03 +- 5.8E-02	U	pCi/g	39%			1.32E-01
	U-238	-1.03E-02 +- 5.8E-02	U	pCi/g	39%			1.35E-01
6117033 LCS,								
M8JX61AC	U-234	3.63E+00 +- 7.9E-01		pCi/g	82%	113%	0.1	8.07E-02
	U-238	3.46E+00 +- 7.6E-01		pCi/g	82%	103%	0.0	7.71E-02

No. of Results: 8

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

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

SAMPLE RESULTS

Date: 13-May-16

Lab Name:	**TestAmerica Inc**	**SDG:**	W07457	**Collection Date:**	4/25/2016 12:51:00 PM
Lot-Sample No.:	**J6D250418-1**	**Report No. :**	68590	**Received Date:**	4/25/2016 3:50:00 PM
Client Sample ID:	**B352X3**	**COC No. :**	F16-020-209	**Matrix:**	SOIL

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
Batch: 6117032	TC99_ETVDSK_LSC			**Work Order:**	M8JNQ1AC		**Report DB ID:**	9M8JNQ10				
Tc-99	**1.19E+02**		1.5E+00	3.1E+00	6.20E-01	pCi/g	100%	*(192.8)*	5/9/16 04:27 p		1.99	LSC10
						2.98E-01	5.00E+00	*(76.)*			g	
Batch: 6117033	UISO_IE_PLATE_AEA			**Work Order:**	M8JNQ1AA		**Report DB ID:**	9M8JNQ10				
U-234	**2.51E-01**		1.2E-01	1.3E-01	6.73E-02	pCi/g	87%	*(3.7)*	5/4/16 04:42 p		0.99	ALP211
						1.85E-02	1.00E+00	*(3.8)*			g	
U-235	**-3.60E-03**	U	3.0E-02	3.0E-02	6.54E-02	pCi/g	87%	*-0.06*	5/4/16 04:42 p		0.99	ALP211
						1.75E-02	1.00E+00	*-0.24*			g	
U-238	**1.91E-01**		1.1E-01	1.1E-01	6.73E-02	pCi/g	87%	*(2.8)*	5/4/16 04:42 p		0.99	ALP211
						1.85E-02	1.00E+00	*(3.4)*			g	

Ratio U-234/238 = 1.3

No. of Results: 4 **Comments:**

May 13, 2016

12/05/16

FORM I

SAMPLE RESULTS

Date: 13-May-16

Lab Name:	**TestAmerica Inc**	**SDG:**	W07457	**Collection Date:**	4/25/2016 10:08:00 AM
Lot-Sample No.:	**J6D250418-2**	**Report No. :**	68590	**Received Date:**	4/25/2016 3:50:00 PM
Client Sample ID:	**B352X5**	**COC No. :**	F16-020-211	**Matrix:**	SOIL

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
Batch: 6117032	TC99_ETVDSK_LSC			**Work Order:** M8JNR1AC			**Report DB ID:** 9M8JNR10					
Tc-99	**5.53E+01**		1.0E+00	1.6E+00	6.01E-01	pCi/g	100%	*(92.)*	5/9/16 05:32 p		2.05	LSC10
						2.88E-01	5.00E+00	*(67.4)*			g	
Batch: 6117033	UISO_IE_PLATE_AEA			**Work Order:** M8JNR1AA			**Report DB ID:** 9M8JNR10					
U-234	**8.73E-02**		7.1E-02	7.3E-02	4.92E-02	pCi/g	91%	*(1.8)*	5/4/16 04:43 p		1.0	ALP217
						1.04E-02	1.00E+00	*(2.4)*			g	
U-235	**-1.16E-03**	U	2.9E-02	2.9E-02	5.33E-02	pCi/g	91%	*-0.02*	5/4/16 04:43 p		1.0	ALP217
						1.22E-02	1.00E+00	*-0.08*			g	
U-238	**3.17E-01**		1.4E-01	1.5E-01	6.13E-02	pCi/g	91%	*(5.2)*	5/4/16 04:43 p		1.0	ALP217
						1.60E-02	1.00E+00	*(4.3)*			g	

Ratio U-234/238 = 0.3

No. of Results: 4 **Comments:**

May 13, 2016

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FORM I

SAMPLE RESULTS

Date: 13-May-16

Lab Name:	**TestAmerica Inc**	**SDG:**	W07457	**Collection Date:**	4/25/2016 2:03:00 PM
Lot-Sample No.:	**J6D250418-3**	**Report No. :**	68590	**Received Date:**	4/25/2016 3:50:00 PM
Client Sample ID:	**B352X7**	**COC No. :**	F16-020-213	**Matrix:**	SOIL

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
Batch: 6117032	TC99_ETVDSK_LSC			**Work Order:** M8JNT1AC			**Report DB ID:** 9M8JNT10					
Tc-99	**8.23E+01**		1.2E+00	2.3E+00	6.02E-01	pCi/g	100%	*(136.6)*	5/9/16 07:41 p		2.06	LSC10
						2.89E-01	5.00E+00	*(72.7)*			g	
Batch: 6117033	UISO_IE_PLATE_AEA			**Work Order:** M8JNT1AA			**Report DB ID:** 9M8JNT10					
U-234	**1.55E-01**		9.4E-02	9.8E-02	4.78E-02	pCi/g	89%	*(3.2)*	5/4/16 04:43 p		1.01	ALP218
						1.01E-02	1.00E+00	*(3.2)*			g	
U-235	**1.36E-02**	U	2.8E-02	2.8E-02	4.78E-02	pCi/g	89%	*0.28*	5/4/16 04:43 p		1.01	ALP218
						1.01E-02	1.00E+00	*0.96*			g	
U-238	**1.13E-01**		8.0E-02	8.2E-02	4.78E-02	pCi/g	89%	*(2.4)*	5/4/16 04:43 p		1.01	ALP218
						1.01E-02	1.00E+00	*(2.7)*			g	

Ratio U-234/238 = 1.4

No. of Results: 4 **Comments:**

May 13, 2016

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FORM II

Date: 13-May-16

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07457	**Collection Date:**	4/25/2016 12:51:00 PM
Lot-Sample No.:	**J6D250418-1**	**Report No. :**	68590	**Received Date:**	4/25/2016 3:50:00 PM
Client Sample ID:	**B352X3 DUP**	**COC No. :**	F16-020-209	**Matrix:**	SOIL

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: 6117033	UISO_IE_PLATE_AEA			**Work Order:**	M8JNQ1AD	**Report DB ID:**	M8JNQ1DR		**Orig Sa DB ID:**	9M8JNQ10		
U-234	2.05E-01		1.2E-01	1.2E-01	8.25E-02	pCi/g	76%	(2.5)	5/4/16 04:42 p		1.04	ALP215
	2.51E-01		**RPD**	**20.2**		1.00E+00		(3.3)			g	
U-235	-5.25E-03	U	3.3E-02	3.3E-02	7.55E-02	pCi/g	76%	-0.07	5/4/16 04:42 p		1.04	ALP215
	-3.60E-03	U	**RPD**	**-37.1**		1.00E+00		-0.32			g	
U-238	1.91E-01		1.1E-01	1.2E-01	7.55E-02	pCi/g	76%	(2.5)	5/4/16 04:42 p		1.04	ALP215
	1.91E-01		**RPD**	**0.1**		1.00E+00		(3.2)			g	

Ratio U-234/238 = 1.1 ***Alpha Spec Result Sum = 3.9E-01***

No. of Results: 3 **Comments:**

May 13, 2016

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FORM II

Date: 13-May-16

DUPLICATE RESULTS

Lab Name:	**TestAmerica Inc**	**SDG:**	W07457	**Collection Date:**	4/25/2016 10:08:00 AM
Lot-Sample No.:	**J6D250418-2**	**Report No. :**	68590	**Received Date:**	4/25/2016 3:50:00 PM
Client Sample ID:	**B352X5 DUP**	**COC No. :**	F16-020-211	**Matrix:**	SOIL

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: 6117032	TC99_ETVDSK_LSC			**Work Order:** M8JNR1AD		**Report DB ID:** M8JNR1DR			**Orig Sa DB ID:** 9M8JNR10			
Tc-99	6.05E+01		1.1E+00	1.8E+00	6.05E-01	pCi/g	100%	(100.1)	5/9/16 06:36 p		2.04	LSC10
	5.53E+01		**RPD**	**9.1**		5.00E+00		(68.6)			g	

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

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FORM II

BLANK RESULTS

Date: 13-May-16

Lab Name: TestAmerica Inc

Matrix: SOIL

SDG: W07457

Report No. : 68590

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
Batch: 6117032	TC99_ETVDSK_LSC			**Work Order:**	M8JX51AA		**Report DB ID:**	M8JX51AB				
Tc-99	-8.49E-02	U	2.5E-01	2.8E-01	6.14E-01	pCi/g	100%	-0.14	5/9/16 09:50 p		2.0	LSC10
					2.95E-01	5.00E+00		-0.6			g	
Batch: 6117033	UISO_IE_PLATE_AEA			**Work Order:**	M8JX61AA		**Report DB ID:**	M8JX61AB				
U-234	4.46E-02	U	8.1E-02	8.2E-02	1.41E-01	pCi/g	39%	0.32	5/4/16 04:43 p		1.08	ALP222
					4.15E-02	1.00E+00		(1.1)			g	
U-235	-9.16E-03	U	5.8E-02	5.8E-02	1.32E-01	pCi/g	39%	-0.07	5/4/16 04:43 p		1.08	ALP222
					3.70E-02	1.00E+00		-0.32			g	
U-238	-1.03E-02	U	5.8E-02	5.8E-02	1.35E-01	pCi/g	39%	-0.08	5/4/16 04:43 p		1.08	ALP222
					3.86E-02	1.00E+00		-0.36			g	
								Ratio U-234/238 = -4.3				

No. of Results: 4 **Comments:**

May 13, 2016

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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

LCS RESULTS

Date: 13-May-16

Lab Name: TestAmerica Inc

SDG: W07457

Matrix: SOIL

Report No. : 68590

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
Batch: 6117032	TC99_ETVDSK_LSC			**Work Order:**	M8JX51AC		**Report DB ID:**	M8JX51CS					
Tc-99	3.07E+01		7.7E-01	1.1E+00	5.89E-01	pCi/g	100%	3.26E+01	1.94E-01	94%	5/9/16 10:55 p	2.09	LSC10
							Rec Limits:	80	120	-0.1		g	
Batch: 6117033	UISO_IE_PLATE_AEA			**Work Order:**	M8JX61AC		**Report DB ID:**	M8JX61CS					
U-234	3.63E+00		4.6E-01	7.9E-01	8.07E-02	pCi/g	82%	3.21E+00	1.70E-02	113%	5/4/16 04:44 p	1.01	ALP223
							Rec Limits:	80	120	0.1		g	
U-238	3.46E+00		4.5E-01	7.6E-01	7.71E-02	pCi/g	82%	3.37E+00	1.78E-02	103%	5/4/16 04:44 p	1.01	ALP223
							Rec Limits:	80	120	0.0		g	

No. of Results: 3 **Comments:**

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

rptSTLRchLcs
V5.5.1 A2002

FORM II

MATRIX SPIKE RESULTS

Date: 13-May-16

Lab Name: TestAmerica Inc **SDG:** W07457

Lot-Sample No.: J6D250418-3, B352X7 **Report No. :** 68590 **Matrix:** SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2 s)	CSU (2 s)	MDC|MDA	Rpt Unit	Yield	Rec-overy	Expected, Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 6117032	**Work Order:** M8JNT1AD			**Report DB ID:** M8JNT1DW			**Orig Sa DB ID:** 9M8JNT10					
Tc-99	2.09E+02		2.3E+00	7.4E+00	5.93E-01	pCi/g	100%	95.96%	2.18E+02	5/9/16 08:45 p	2.08	TC99_ETVDSK_LSC
	8.23E+01								1.24E+00		g	LSC10

Number of Results: 1

Comments:

May 13, 2016

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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.

V5.5.1 A2002