

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis  
13715 Rider Trail North  
Earth City, MO 63045  
Tel: (314)298-8566

TestAmerica Job ID: 160-3530-1

Client Project/Site: RFP-CBA-022 (7 DAY TAT)

For:

Westinghouse Electric Company LLC  
3300 State Road P  
Festus, Missouri 63028

Attn: Martin Swanson



Authorized for release by:  
8/30/2013 4:25:39 PM

Ivan Vania, Project Manager I  
[ivan.vania@testamericainc.com](mailto:ivan.vania@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Case Narrative

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

**Job ID: 160-3530-1**

**Laboratory: TestAmerica St. Louis**

**Narrative**

### CASE NARRATIVE

**Client: Westinghouse Electric Company LLC**

**Project: RFP-CBA-022 (7 DAY TAT)**

**Report Number: 160-3530-1**

With the 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. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

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

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### **RECEIPT**

The samples were received on 08/26/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 20.0 C.

#### **TECHNETIUM-99 (ICPMS)**

Samples L050328PUI01 (160-3530-1), L050328PUI02 (160-3530-2), L050328PUI03 (160-3530-3), L050328PUI04 (160-3530-4), L050328PUI05 (160-3530-5), L050328PUI06 (160-3530-6), L050328PUI07 (160-3530-7), L050341PUB00 (160-3530-8) and L050342PUB00 (160-3530-9) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/28/2013 and analyzed on 08/29/2013.

No difficulties were encountered during the Tc-99 analysis. All quality control parameters were within the acceptance limits.

#### **PERCENT SOLIDS**

Samples L050328PUI01 (160-3530-1), L050328PUI02 (160-3530-2), L050328PUI03 (160-3530-3), L050328PUI04 (160-3530-4), L050328PUI05 (160-3530-5), L050328PUI06 (160-3530-6), L050328PUI07 (160-3530-7), L050341PUB00 (160-3530-8) and

## Case Narrative

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

### Job ID: 160-3530-1 (Continued)

#### Laboratory: TestAmerica St. Louis (Continued)

L050342PUB00 (160-3530-9) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 08/28/2013.

No difficulties were encountered during the % solids analysis. All quality control parameters were within the acceptance limits.

#### CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L050328PUI01 (160-3530-1), L050328PUI02 (160-3530-2), L050328PUI03 (160-3530-3), L050328PUI04 (160-3530-4), L050328PUI05 (160-3530-5), L050328PUI06 (160-3530-6), L050328PUI07 (160-3530-7), L050341PUB00 (160-3530-8) and L050342PUB00 (160-3530-9) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 08/27/2013, and prepared and analyzed on 08/29/2013.

Preparation Batch 69554:

Radium-226 is reported in these samples at the client's request. Radium-226 is reported from the 609.31 keV line of Bismuth-214. Because the samples have not had a 21-day ingrowth, the activity for Radium-226 is an estimated value and may be biased low. This bias is caused by the disruption of secular equilibrium between Radium-226 and Bismuth-214 by the loss of Radon-222 during sample preparation. (160-3530-9 DU), (LCS 160-69554/2-A), (MB 160-69554/1-A), L050328PUI01 (160-3530-1), L050328PUI02 (160-3530-2), L050328PUI03 (160-3530-3), L050328PUI04 (160-3530-4), L050328PUI05 (160-3530-5), L050328PUI06 (160-3530-6), L050328PUI07 (160-3530-7), L050341PUB00 (160-3530-8), L050342PUB00 (160-3530-9)

The reporting limit for Thorium-234 was not met due to insufficient sample weight available for analysis. Analytical results are reported with the MDC achieved. (160-3530-9 DU), L050328PUI01 (160-3530-1), L050328PUI02 (160-3530-2), L050328PUI03 (160-3530-3), L050328PUI04 (160-3530-4), L050328PUI05 (160-3530-5), L050328PUI06 (160-3530-6), L050328PUI07 (160-3530-7), L050341PUB00 (160-3530-8), L050342PUB00 (160-3530-9)

No other difficulties were encountered during the Gamma spec analysis. All other quality control parameters were within the acceptance limits.

Hematite Decommissioning Project				Procedure HDP-PR-QA-006, Chain of Custody												Page 1 of 1																																							
				Revision: 3																																																			
				Westinghouse Non-Proprietary Class 3																																																			
FORM HDP-PR-QA-006-1 CHAIN OF CUSTODY																																																							
Instructions: Each time the container is transferred to another organization, a person from each organization should sign the CoC. The Laboratory/End User must verify that the sample is correctly identified before the sample is released for use or analysis and send the completed CoC to HDP.																																																							
Chain of Custody ID No. F-082613-01 Page 1/1				Requested Analysis												Laboratory Name: TA-MO  Laboratory Address: 13715 Rider Trail North  Phone No. 314-298-8566 Laboratory Contact Person: Joe Walker Phone No. 708-870-8453 Turn Around Time Rush (7 days)																																							
Project Name: Westinghouse Electric Company  Contact Person: Gerald Rood  Phone Number: 314-810-3382 Sampler Name: Scott Jenkins				Total Containers	Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Sample ID</th> <th>Date</th> <th>Time</th> <th>Matrix</th> </tr> <tr><td>L050328PUI01</td><td>8/23/2013</td><td>10:30</td><td>S</td></tr> <tr><td>L050328PUI02</td><td>8/23/2013</td><td>10:50</td><td>S</td></tr> <tr><td>L050328PUI03</td><td>8/23/2013</td><td>11:05</td><td>S</td></tr> <tr><td>L050328PUI04</td><td>8/23/2013</td><td>14:10</td><td>S</td></tr> <tr><td>L050328PUI05</td><td>8/23/2013</td><td>14:00</td><td>S</td></tr> <tr><td>L050328PUI06</td><td>8/23/2013</td><td>14:40</td><td>S</td></tr> <tr><td>L050328PUI07</td><td>8/23/2013</td><td>15:00</td><td>S</td></tr> <tr><td>L050341PUB00</td><td>8/23/2013</td><td>15:30</td><td>S</td></tr> <tr><td>L050342PUB00</td><td>8/23/2013</td><td>15:35</td><td>S</td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>																Sample ID	Date		Time	Matrix	L050328PUI01	8/23/2013	10:30	S	L050328PUI02	8/23/2013	10:50	S	L050328PUI03	8/23/2013	11:05	S	L050328PUI04	8/23/2013	14:10	S	L050328PUI05	8/23/2013	14:00	S	L050328PUI06	8/23/2013	14:40	S	L050328PUI07	8/23/2013	15:00	S	L050341PUB00	8/23/2013	15:30	S	L050342PUB00	8/23/2013	15:35
Sample ID	Date	Time	Matrix																																																				
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L050328PUI07	8/23/2013	15:00	S																																																				
L050341PUB00	8/23/2013	15:30	S																																																				
L050342PUB00	8/23/2013	15:35	S																																																				
Relinquished by: <i>[Signature]</i> Date/Time: 8/26/13 16:20 Company Name: WEC Received by: <i>[Signature]</i> Date/Time: 8-26 16:20 Company Name: Crossroads Relinquished by: <i>[Signature]</i> Date/Time: 8-26 18:30 Company Name: Crossroads Received by: <i>[Signature]</i> Date/Time: 8-26-13 18:30 Company Name: Crossroads				Total 9 Cooler ID: 0826-03 Comments: Please re-analyze the samples after 21-day ingrowth period. Verified By: <i>[Signature]</i>																																																			
				Cooler Temperature: Ambient																																																			
				Shipper and Number:																																																			

3530

LSA 0503 Investigation

LSA 0503 Investigation

## Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3530-1

Login Number: 3530

List Source: TestAmerica St. Louis

List Number: 1

Creator: Clarke, Jill C

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Definitions/Glossary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

### Qualifiers

#### Rad

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## Method Summary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS), Tc-99	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL
6020A	Metals (ICP/MS), Tc-99 in Activity	SW846	TAL SL
GA-01-R	Cesium-137 & Other Gamma Emitters (GS)	DOE	TAL SL

### Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

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

### Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



## Sample Summary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3530-1	L050328PUI01	Solid	08/23/13 10:30	08/26/13 18:30
160-3530-2	L050328PUI02	Solid	08/23/13 10:50	08/26/13 18:30
160-3530-3	L050328PUI03	Solid	08/23/13 11:05	08/26/13 18:30
160-3530-4	L050328PUI04	Solid	08/23/13 14:10	08/26/13 18:30
160-3530-5	L050328PUI05	Solid	08/23/13 14:00	08/26/13 18:30
160-3530-6	L050328PUI06	Solid	08/23/13 14:40	08/26/13 18:30
160-3530-7	L050328PUI07	Solid	08/23/13 15:00	08/26/13 18:30
160-3530-8	L050341PUB00	Solid	08/23/13 15:30	08/26/13 18:30
160-3530-9	L050342PUB00	Solid	08/23/13 15:35	08/26/13 18:30

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

**Client Sample ID: L050328PUI01**

**Lab Sample ID: 160-3530-1**

**Date Collected: 08/23/13 10:30**

**Matrix: Solid**

**Date Received: 08/26/13 18:30**

**Percent Solids: 82.2**

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00067	0.000020	mg/Kg	☆	08/28/13 13:17	08/29/13 15:29	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0403	U	-0.0338	0.0378	1.35	0.230	pCi/g	08/28/13 13:17	08/29/13 15:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	90		30 - 110					08/28/13 13:17	08/29/13 15:29	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.987		0.143	0.175		0.114	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Americium 241	-0.0105	U	0.350	0.350		0.121	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Bismuth 212	1.28		0.501	0.519		0.468	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Bismuth 214	0.844		0.111	0.142		0.0786	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Lead 212	1.22		0.0862	0.180		0.0703	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Lead 214	0.802		0.0957	0.127		0.0755	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Potassium 40	22.0		1.44	2.67		0.305	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Protactinium 231	0.388	U	0.209	0.213		1.37	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Radium 226	0.844		0.111	0.142	1.00	0.0786	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Thorium 234	3.48		0.961	1.03	1.00	1.12	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Uranium 235	0.639		0.200	0.210		0.233	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Protactinium 234m	3.05	U	2.32	2.35		6.23	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Thorium 232	0.987		0.143	0.175		0.114	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.359		0.0540	0.0656		0.0405	pCi/g	08/29/13 12:01	08/29/13 18:38	1

**Client Sample ID: L050328PUI02**

**Lab Sample ID: 160-3530-2**

**Date Collected: 08/23/13 10:50**

**Matrix: Solid**

**Date Received: 08/26/13 18:30**

**Percent Solids: 82.1**

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00069	0.000021	mg/Kg	☆	08/28/13 13:17	08/29/13 15:49	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.00916	U	-0.0382	0.0432	1.37	0.235	pCi/g	08/28/13 13:17	08/29/13 15:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					08/28/13 13:17	08/29/13 15:49	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Client Sample ID: L050328PUI02

Lab Sample ID: 160-3530-2

Date Collected: 08/23/13 10:50

Matrix: Solid

Date Received: 08/26/13 18:30

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.19		0.135	0.177		0.124	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Americium 241	-0.0485	U	0.397	0.397		0.110	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 212	1.55		0.529	0.550		0.444	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 214	0.790		0.0973	0.124		0.0674	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 212	1.17		0.0830	0.151		0.0695	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 214	0.993		0.102	0.140		0.0772	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Potassium 40	24.3		1.43	2.75		0.298	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 231	0.458	U	0.307	0.311		1.18	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Radium 226	0.790		0.0973	0.124	1.00	0.0674	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Thorium 234	4.04		0.892	0.976	1.00	1.02	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Uranium 235	0.811		0.198	0.213		0.215	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 234m	4.01	U	3.65	3.67		5.81	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Thorium 232	1.19		0.135	0.177		0.124	pCi/g	08/29/13 12:01	08/29/13 18:39	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Tl-208	0.386		0.0529	0.0649		0.0391	pCi/g	08/29/13 12:01	08/29/13 18:39	1

Client Sample ID: L050328PUI03

Lab Sample ID: 160-3530-3

Date Collected: 08/23/13 11:05

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 83.6

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00068	0.000021	mg/Kg	☆	08/28/13 13:17	08/29/13 15:52	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Technetium 99	-0.0324	U	-0.0335	0.0387	1.37	0.235	pCi/g	08/28/13 13:17	08/29/13 15:52	1
<b>Carrier</b>										
	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					08/28/13 13:17	08/29/13 15:52	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.08		0.148	0.184		0.144	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Americium 241	0.0599	U	0.0900	0.0902		0.149	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 212	0.983		0.410	0.422		0.550	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 214	0.725		0.113	0.136		0.0878	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 212	1.02		0.0863	0.158		0.0789	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 214	0.778		0.0951	0.125		0.0795	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Potassium 40	21.7		1.53	2.70		0.337	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 231	0.816	U	0.438	0.447		1.27	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Radium 226	0.725		0.113	0.136	1.00	0.0878	pCi/g	08/29/13 12:01	08/29/13 18:39	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Client Sample ID: L050328PUI03

Lab Sample ID: 160-3530-3

Date Collected: 08/23/13 11:05

Matrix: Solid

Date Received: 08/26/13 18:30

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 234	8.02		1.24	1.50	1.00	1.31	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Uranium 235	1.76		0.284	0.336		0.312	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 234m	6.98		4.54	4.60		6.87	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Thorium 232	1.08		0.148	0.184		0.144	pCi/g	08/29/13 12:01	08/29/13 18:39	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.361		0.0623	0.0727		0.0477	pCi/g	08/29/13 12:01	08/29/13 18:39	1

Client Sample ID: L050328PUI04

Lab Sample ID: 160-3530-4

Date Collected: 08/23/13 14:10

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 83.5

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00069	0.000021	mg/Kg	☼	08/28/13 13:17	08/29/13 15:56	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0420	U	-0.0484	0.0564	1.39	0.238	pCi/g	08/28/13 13:17	08/29/13 15:56	1
<b>Carrier</b>										
Re	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	86		30 - 110					08/28/13 13:17	08/29/13 15:56	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.12		0.140	0.180		0.108	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Americium 241	0.000611	U	0.0681	0.0681		0.115	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 212	1.36		0.444	0.466		0.428	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Bismuth 214	0.708		0.101	0.125		0.0780	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 212	1.15		0.0780	0.168		0.0641	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Lead 214	0.856		0.0741	0.116		0.0695	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Potassium 40	22.5		1.27	2.63		0.254	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 231	0.514	U	0.223	0.230		1.24	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Radium 226	0.708		0.101	0.125	1.00	0.0780	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Thorium 234	7.15		1.11	1.34	1.00	1.21	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Uranium 235	1.17		0.213	0.244		0.223	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Protactinium 234m	7.21		3.56	3.63		5.07	pCi/g	08/29/13 12:01	08/29/13 18:39	1
Thorium 232	1.12		0.140	0.180		0.108	pCi/g	08/29/13 12:01	08/29/13 18:39	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.332		0.0461	0.0575		0.0351	pCi/g	08/29/13 12:01	08/29/13 18:39	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Client Sample ID: L050328PUI05

Lab Sample ID: 160-3530-5

Date Collected: 08/23/13 14:00

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 81.7

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00067	0.000020	mg/Kg	☼	08/28/13 13:17	08/29/13 16:00	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0477	U	-0.0611	0.0677	1.35	0.230	pCi/g	08/28/13 13:17	08/29/13 16:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	91		30 - 110					08/28/13 13:17	08/29/13 16:00	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.17		0.168	0.206		0.190	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Americium 241	-0.00731	U	0.0833	0.0834		0.141	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Bismuth 212	0.496	U	0.445	0.448		0.706	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Bismuth 214	0.862		0.137	0.164		0.0969	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Lead 212	1.20		0.0956	0.182		0.0764	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Lead 214	0.949		0.115	0.152		0.0825	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Potassium 40	22.3		1.66	2.82		0.373	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Protactinium 231	0.407	U	0.253	0.257		1.55	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Radium 226	0.862		0.137	0.164	1.00	0.0969	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Thorium 234	4.16		0.975	1.07	1.00	1.15	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Uranium 235	0.769		0.177	0.194		0.236	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Protactinium 234m	3.07	U	4.70	4.71		7.88	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Thorium 232	1.17		0.168	0.206		0.190	pCi/g	08/29/13 12:01	08/29/13 20:12	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.367		0.0684	0.0782		0.0527	pCi/g	08/29/13 12:01	08/29/13 20:12	1

Client Sample ID: L050328PUI06

Lab Sample ID: 160-3530-6

Date Collected: 08/23/13 14:40

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 82.7

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00070	0.000021	mg/Kg	☼	08/28/13 13:17	08/29/13 16:04	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0167	U	-0.0345	0.0400	1.39	0.238	pCi/g	08/28/13 13:17	08/29/13 16:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	86		30 - 110					08/28/13 13:17	08/29/13 16:04	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Client Sample ID: L050328PUI06

Lab Sample ID: 160-3530-6

Date Collected: 08/23/13 14:40

Matrix: Solid

Date Received: 08/26/13 18:30

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.08		0.112	0.157		0.122	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Americium 241	0.0268	U	0.0672	0.0672		0.112	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Bismuth 212	1.35		0.585	0.601		0.505	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Bismuth 214	0.815		0.106	0.136		0.0787	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Lead 212	1.21		0.0770	0.175		0.0587	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Lead 214	0.908		0.0862	0.128		0.0696	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Potassium 40	21.0		1.21	2.46		0.305	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Protactinium 231	0.483	U	0.228	0.234		1.16	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Radium 226	0.815		0.106	0.136	1.00	0.0787	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Thorium 234	2.79		0.918	0.964	1.00	1.04	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Uranium 235	0.455		0.190	0.195		0.225	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Protactinium 234m	5.34		3.27	3.32		5.28	pCi/g	08/29/13 12:01	08/29/13 20:10	1
Thorium 232	1.08		0.112	0.157		0.122	pCi/g	08/29/13 12:01	08/29/13 20:10	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Tl-208	0.387		0.0475	0.0622		0.0322	pCi/g	08/29/13 12:01	08/29/13 20:10	1

Client Sample ID: L050328PUI07

Lab Sample ID: 160-3530-7

Date Collected: 08/23/13 15:00

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 82.7

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00069	0.000021	mg/Kg	☆	08/28/13 13:17	08/29/13 16:08	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Technetium 99	-0.0219	U	-0.0717	0.0812	1.37	0.235	pCi/g	08/28/13 13:17	08/29/13 16:08	1
<b>Carrier</b>										
	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					08/28/13 13:17	08/29/13 16:08	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.05		0.154	0.188		0.0998	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Americium 241	-0.0899	U	0.114	0.114		0.188	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Bismuth 212	1.07		0.406	0.421		0.412	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Bismuth 214	0.709		0.0937	0.119		0.0733	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Lead 212	0.913		0.0793	0.142		0.0884	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Lead 214	0.852		0.0971	0.131		0.0776	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Potassium 40	23.4		1.28	2.71		0.306	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Protactinium 231	0.394	U	0.232	0.236		1.24	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Radium 226	0.709		0.0937	0.119	1.00	0.0733	pCi/g	08/29/13 12:01	08/29/13 20:11	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

Client Sample ID: L050328PUI07

Lab Sample ID: 160-3530-7

Date Collected: 08/23/13 15:00

Matrix: Solid

Date Received: 08/26/13 18:30

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 234	19.4		1.61	2.59	1.00	1.59	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Uranium 235	2.69		0.265	0.381		0.337	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Protactinium 234m	29.7		5.30	6.09		3.30	pCi/g	08/29/13 12:01	08/29/13 20:11	1
Thorium 232	1.05		0.154	0.188		0.0998	pCi/g	08/29/13 12:01	08/29/13 20:11	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.355		0.0500	0.0621		0.0392	pCi/g	08/29/13 12:01	08/29/13 20:11	1

Client Sample ID: L050341PUB00

Lab Sample ID: 160-3530-8

Date Collected: 08/23/13 15:30

Matrix: Solid

Date Received: 08/26/13 18:30

Percent Solids: 85.4

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00078	0.000023	mg/Kg	☼	08/28/13 13:17	08/29/13 16:12	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0388	U	0.0681	0.0900	1.55	0.266	pCi/g	08/28/13 13:17	08/29/13 16:12	1
<b>Carrier</b>										
Re	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
	76		30 - 110					08/28/13 13:17	08/29/13 16:12	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.25		0.152	0.198		0.0977	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Americium 241	0.0614	U	0.0789	0.0791		0.130	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Bismuth 212	1.26		0.387	0.408		0.365	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Bismuth 214	0.764		0.0802	0.113		0.0621	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Lead 212	1.10		0.0594	0.155		0.0494	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Lead 214	0.813		0.0755	0.113		0.0615	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Potassium 40	18.9		0.914	2.14		0.246	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Protactinium 231	-0.599	U	0.592	0.595		0.967	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Radium 226	0.764		0.0802	0.113	1.00	0.0621	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Thorium 234	36.0		1.30	3.98	1.00	1.20	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Uranium 235	1.78		0.205	0.274		0.217	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Protactinium 234m	38.4		4.91	6.26		3.40	pCi/g	08/29/13 12:01	08/29/13 23:57	1
Thorium 232	1.25		0.152	0.198		0.0977	pCi/g	08/29/13 12:01	08/29/13 23:57	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.342		0.0480	0.0598		0.0379	pCi/g	08/29/13 12:01	08/29/13 23:57	1

TestAmerica St. Louis

# Client Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

**Client Sample ID: L050342PUB00**

**Lab Sample ID: 160-3530-9**

**Date Collected: 08/23/13 15:35**

**Matrix: Solid**

**Date Received: 08/26/13 18:30**

**Percent Solids: 84.7**

## Method: 6020A - Metals (ICP/MS), Tc-99

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00075	0.000022	mg/Kg	☼	08/28/13 13:17	08/29/13 16:16	1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.0716	U	-0.0428	0.0554	1.50	0.257	pCi/g	08/28/13 13:17	08/29/13 16:16	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	78		30 - 110	08/28/13 13:17	08/29/13 16:16	1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.02		0.139	0.174		0.112	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Americium 241	0.0126	U	0.117	0.117		0.195	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Bismuth 212	1.43		0.494	0.515		0.441	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Bismuth 214	0.836		0.108	0.139		0.0713	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Lead 212	0.980		0.0818	0.151		0.0707	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Lead 214	0.737		0.104	0.129		0.0855	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Potassium 40	20.3		1.44	2.52		0.187	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Protactinium 231	1.17		0.442	0.461		1.02	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Radium 226	0.836		0.108	0.139	1.00	0.0713	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Thorium 234	18.0		1.67	2.52	1.00	1.69	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Uranium 235	4.50		0.352	0.577		0.431	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Protactinium 234m	26.3		7.30	7.77		5.70	pCi/g	08/29/13 12:01	08/29/13 21:17	1
Thorium 232	1.02		0.139	0.174		0.112	pCi/g	08/29/13 12:01	08/29/13 21:17	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.313		0.0513	0.0607		0.0399	pCi/g	08/29/13 12:01	08/29/13 21:17	1

TestAmerica St. Louis



# QC Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

## Method: 6020A - Metals (ICP/MS), Tc-99

Lab Sample ID: MB 160-69128/1-A

Matrix: Solid

Analysis Batch: 69867

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 69128

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00053	0.000016	mg/Kg		08/28/13 13:17	08/29/13 15:21	1

Lab Sample ID: LCS 160-69128/2-A

Matrix: Solid

Analysis Batch: 69867

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00260	0.00252		mg/Kg		97	80 - 120

Lab Sample ID: 160-3530-1 MS

Matrix: Solid

Analysis Batch: 69867

Client Sample ID: L050328PUI01

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00308	0.00308		mg/Kg	☼	100	75 - 125

Lab Sample ID: 160-3530-1 MSD

Matrix: Solid

Analysis Batch: 69867

Client Sample ID: L050328PUI01

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00320	0.00308		mg/Kg	☼	96	75 - 125	0	30

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Lab Sample ID: MB 160-69128/1-A

Matrix: Solid

Analysis Batch: 69868

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 69128

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.08124	U	0.0563	0.0598	1.05	0.180	pCi/g	08/28/13 13:17	08/29/13 15:21	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	95		30 - 110	08/28/13 13:17	08/29/13 15:21	1

Lab Sample ID: LCS 160-69128/2-A

Matrix: Solid

Analysis Batch: 69868

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	44.5	43.20		4.49	1.11	0.190	pCi/g	97	80 - 120

Carrier	LCS %Yield	LCS Qualifier	Limits
Re	90		30 - 110

TestAmerica St. Louis

# QC Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

## Method: 6020A - Metals (ICP/MS), Tc-99 in Activity (Continued)

Lab Sample ID: 160-3530-1 MS

Matrix: Solid

Analysis Batch: 69868

Client Sample ID: L050328PUI01

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	-0.0403	U	52.7	52.67		5.31	1.32	0.226	pCi/g	100	75 - 125
<b>Carrier</b>											
	<b>MS %Yield</b>	<b>MS Qualifier</b>	<b>Limits</b>								
Re	92		30 - 110								

Lab Sample ID: 160-3530-1 MSD

Matrix: Solid

Analysis Batch: 69868

Client Sample ID: L050328PUI01

Prep Type: Total/NA

Prep Batch: 69128

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Technetium 99	-0.0403	U	54.7	52.66		5.59	1.37	0.234	pCi/g	96	75 - 125	0	1
<b>Carrier</b>													
	<b>MSD %Yield</b>	<b>MSD Qualifier</b>	<b>Limits</b>										
Re	89		30 - 110										

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-69554/1-A

Matrix: Solid

Analysis Batch: 69583

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 69554

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01444	U	0.0248	0.0248		0.0446	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Americium 241	-0.001515	U	0.0133	0.0133		0.0238	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Bismuth 212	-0.005444	U	0.108	0.108		0.205	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Bismuth 214	-0.002905	U	0.0233	0.0233		0.0369	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Lead 212	0.002391	U	0.0118	0.0119		0.0240	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Lead 214	-0.003482	U	0.0242	0.0242		0.0322	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Potassium 40	-0.009401	U	0.128	0.128		0.280	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Protactinium 231	0.02744	U	0.0914	0.0914		0.394	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Radium 226	-0.002905	U	0.0233	0.0233	1.00	0.0369	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Thorium 234	0.09096	U	0.152	0.153	1.00	0.245	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Uranium 235	0.006568	U	0.0359	0.0359		0.0641	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Protactinium 234m	0.4895	U	1.04	1.04		1.86	pCi/g	08/29/13 12:01	08/29/13 18:38	1
Thorium 232	0.01444	U	0.0248	0.0248		0.0446	pCi/g	08/29/13 12:01	08/29/13 18:38	1
<b>Other Detected Radionuclides</b>										
	<b>MB Result</b>	<b>MB Qualifier</b>	<b>Count Uncert. (2σ+/-)</b>	<b>Total Uncert. (2σ+/-)</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Other Detected Radionuclide	None						pCi/g	08/29/13 12:01	08/29/13 18:38	1

TestAmerica St. Louis

# QC Sample Results

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

## Method: GA-01-R - Cesium-137 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-69554/2-A  
Matrix: Solid  
Analysis Batch: 69584

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 69554

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	97.7	90.84		9.45		0.483	pCi/g	93	87 - 116
Cesium 137	31.6	29.85		3.12	0.200	0.141	pCi/g	94	87 - 120
Cobalt 60	24.8	23.24		2.35		0.104	pCi/g	94	87 - 115

Lab Sample ID: 160-3530-9 DU  
Matrix: Solid  
Analysis Batch: 69590

Client Sample ID: L050342PUB00  
Prep Type: Total/NA  
Prep Batch: 69554

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.02		1.150		0.197		0.0915	pCi/g	0.36	1
Americium 241	0.0126	U	0.05083	U	0.107		0.177	pCi/g	0.17	1
Bismuth 212	1.43		0.8832		0.449		0.627	pCi/g	0.56	1
Bismuth 214	0.836		0.9046		0.163		0.0905	pCi/g	0.23	1
Lead 212	0.980		0.9992		0.154		0.0714	pCi/g	0.06	1
Lead 214	0.737		0.8648		0.141		0.0987	pCi/g	0.48	1
Potassium 40	20.3		18.88		2.49		0.679	pCi/g	0.28	1
Protactinium 231	1.17		0.3256	U	0.539		0.902	pCi/g	0.85	1
Radium 226	0.836		0.9046		0.163	1.00	0.0905	pCi/g	0.23	1
Thorium 234	18.0		21.36		2.91	1.00	1.85	pCi/g	0.61	1
Uranium 235	4.50		4.616		0.586		0.368	pCi/g	0.1	1
Protactinium 234m	26.3		25.62		7.60		5.90	pCi/g	0.05	1
Thorium 232	1.02		1.150		0.197		0.0915	pCi/g	0.36	1

# QC Association Summary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

## Metals

### Prep Batch: 69128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	None	
160-3530-1 MS	L050328PUI01	Total/NA	Solid	None	
160-3530-1 MSD	L050328PUI01	Total/NA	Solid	None	
160-3530-2	L050328PUI02	Total/NA	Solid	None	
160-3530-3	L050328PUI03	Total/NA	Solid	None	
160-3530-4	L050328PUI04	Total/NA	Solid	None	
160-3530-5	L050328PUI05	Total/NA	Solid	None	
160-3530-6	L050328PUI06	Total/NA	Solid	None	
160-3530-7	L050328PUI07	Total/NA	Solid	None	
160-3530-8	L050341PUB00	Total/NA	Solid	None	
160-3530-9	L050342PUB00	Total/NA	Solid	None	
LCS 160-69128/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-69128/1-A	Method Blank	Total/NA	Solid	None	

### Analysis Batch: 69867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	6020A	69128
160-3530-1 MS	L050328PUI01	Total/NA	Solid	6020A	69128
160-3530-1 MSD	L050328PUI01	Total/NA	Solid	6020A	69128
160-3530-2	L050328PUI02	Total/NA	Solid	6020A	69128
160-3530-3	L050328PUI03	Total/NA	Solid	6020A	69128
160-3530-4	L050328PUI04	Total/NA	Solid	6020A	69128
160-3530-5	L050328PUI05	Total/NA	Solid	6020A	69128
160-3530-6	L050328PUI06	Total/NA	Solid	6020A	69128
160-3530-7	L050328PUI07	Total/NA	Solid	6020A	69128
160-3530-8	L050341PUB00	Total/NA	Solid	6020A	69128
160-3530-9	L050342PUB00	Total/NA	Solid	6020A	69128
LCS 160-69128/2-A	Lab Control Sample	Total/NA	Solid	6020A	69128
MB 160-69128/1-A	Method Blank	Total/NA	Solid	6020A	69128

## General Chemistry

### Analysis Batch: 68961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	Moisture	
160-3530-2	L050328PUI02	Total/NA	Solid	Moisture	
160-3530-3	L050328PUI03	Total/NA	Solid	Moisture	
160-3530-4	L050328PUI04	Total/NA	Solid	Moisture	
160-3530-5	L050328PUI05	Total/NA	Solid	Moisture	
160-3530-6	L050328PUI06	Total/NA	Solid	Moisture	
160-3530-7	L050328PUI07	Total/NA	Solid	Moisture	
160-3530-8	L050341PUB00	Total/NA	Solid	Moisture	
160-3530-9	L050342PUB00	Total/NA	Solid	Moisture	
160-3530-9 DU	L050342PUB00	Total/NA	Solid	Moisture	

## Rad

### Leach Batch: 68914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	Dry and Grind	

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## QC Association Summary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

### Rad (Continued)

#### Leach Batch: 68914 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-2	L050328PUI02	Total/NA	Solid	Dry and Grind	
160-3530-3	L050328PUI03	Total/NA	Solid	Dry and Grind	
160-3530-4	L050328PUI04	Total/NA	Solid	Dry and Grind	
160-3530-5	L050328PUI05	Total/NA	Solid	Dry and Grind	
160-3530-6	L050328PUI06	Total/NA	Solid	Dry and Grind	
160-3530-7	L050328PUI07	Total/NA	Solid	Dry and Grind	
160-3530-8	L050341PUB00	Total/NA	Solid	Dry and Grind	
160-3530-9	L050342PUB00	Total/NA	Solid	Dry and Grind	
160-3530-9 DU	L050342PUB00	Total/NA	Solid	Dry and Grind	

#### Prep Batch: 69128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	None	
160-3530-1 MS	L050328PUI01	Total/NA	Solid	None	
160-3530-1 MSD	L050328PUI01	Total/NA	Solid	None	
160-3530-2	L050328PUI02	Total/NA	Solid	None	
160-3530-3	L050328PUI03	Total/NA	Solid	None	
160-3530-4	L050328PUI04	Total/NA	Solid	None	
160-3530-5	L050328PUI05	Total/NA	Solid	None	
160-3530-6	L050328PUI06	Total/NA	Solid	None	
160-3530-7	L050328PUI07	Total/NA	Solid	None	
160-3530-8	L050341PUB00	Total/NA	Solid	None	
160-3530-9	L050342PUB00	Total/NA	Solid	None	
LCS 160-69128/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-69128/1-A	Method Blank	Total/NA	Solid	None	

#### Prep Batch: 69554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3530-1	L050328PUI01	Total/NA	Solid	Fill_Geo-0	68914
160-3530-2	L050328PUI02	Total/NA	Solid	Fill_Geo-0	68914
160-3530-3	L050328PUI03	Total/NA	Solid	Fill_Geo-0	68914
160-3530-4	L050328PUI04	Total/NA	Solid	Fill_Geo-0	68914
160-3530-5	L050328PUI05	Total/NA	Solid	Fill_Geo-0	68914
160-3530-6	L050328PUI06	Total/NA	Solid	Fill_Geo-0	68914
160-3530-7	L050328PUI07	Total/NA	Solid	Fill_Geo-0	68914
160-3530-8	L050341PUB00	Total/NA	Solid	Fill_Geo-0	68914
160-3530-9	L050342PUB00	Total/NA	Solid	Fill_Geo-0	68914
160-3530-9 DU	L050342PUB00	Total/NA	Solid	Fill_Geo-0	68914
LCS 160-69554/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-69554/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

## Tracer/Carrier Summary

Client: Westinghouse Electric Company LLC  
Project/Site: RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-3530-1

### Method: 6020A - Metals (ICP/MS), Tc-99 in Activity

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Re (30-110)	
160-3530-1	L050328PUI01	90	
160-3530-1 MS	L050328PUI01	92	
160-3530-1 MSD	L050328PUI01	89	
160-3530-2	L050328PUI02	88	
160-3530-3	L050328PUI03	87	
160-3530-4	L050328PUI04	86	
160-3530-5	L050328PUI05	91	
160-3530-6	L050328PUI06	86	
160-3530-7	L050328PUI07	88	
160-3530-8	L050341PUB00	76	
160-3530-9	L050342PUB00	78	
LCS 160-69128/2-A	Lab Control Sample	90	
MB 160-69128/1-A	Method Blank	95	
<b>Tracer/Carrier Legend</b>			
Re = Re			