

# 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: 160-3435-2

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:  
9/19/2013 6:05:33 AM

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: 160-3435-2

**Job ID: 160-3435-2**

**Laboratory: TestAmerica St. Louis**

**Narrative**

### CASE NARRATIVE

**Client: Westinghouse Electric Company LLC**

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

**Report Number: 160-3435-1**

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 08/20/2013; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 22.0° C and 22.0° C.

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

Samples L050190TUB00 (160-3435-1), L050191TUB00 (160-3435-2), L050192TUB00 (160-3435-3), L050193TUB00 (160-3435-4), L050194TUB00 (160-3435-5), L050195TUB00 (160-3435-6), L050196TUB00 (160-3435-7), L050197TUB00 (160-3435-8), L050247PRS00 (160-3435-9), L050248PES00 (160-3435-10), L050249PRS00 (160-3435-11), L050250PES00 (160-3435-12), L050251PRS00 (160-3435-13), L050252PES00 (160-3435-14), L050253PES00 (160-3435-15), L050254PES00 (160-3435-16), L050255PES00 (160-3435-17), L050256PRS00 (160-3435-18), L050257PES00 (160-3435-19), L050258PES00 (160-3435-20), L050259PRQ00 (160-3435-21), L050259PRS00 (160-3435-22), L050260PES00 (160-3435-23), L050261PRS00 (160-3435-24), L050262PES00 (160-3435-25), L050263PES00 (160-3435-26), L050264PRS00 (160-3435-27), L050265PES00 (160-3435-28), L050266PUB00 (160-3435-29), L050267PUB00 (160-3435-30) and L050268PUB00 (160-3435-31) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/22/2013 and analyzed on 08/23/2013.

## Case Narrative

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

TestAmerica Job ID: 160-3435-2

### Job ID: 160-3435-2 (Continued)

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

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

#### PERCENT SOLIDS

Samples L050190TUB00 (160-3435-1), L050191TUB00 (160-3435-2), L050192TUB00 (160-3435-3), L050193TUB00 (160-3435-4), L050194TUB00 (160-3435-5), L050195TUB00 (160-3435-6), L050196TUB00 (160-3435-7), L050197TUB00 (160-3435-8), L050247PRS00 (160-3435-9), L050248PES00 (160-3435-10), L050249PRS00 (160-3435-11), L050250PES00 (160-3435-12), L050251PRS00 (160-3435-13), L050252PES00 (160-3435-14), L050253PES00 (160-3435-15), L050254PES00 (160-3435-16), L050255PES00 (160-3435-17), L050256PRS00 (160-3435-18), L050257PES00 (160-3435-19), L050258PES00 (160-3435-20), L050259PRQ00 (160-3435-21), L050259PRS00 (160-3435-22), L050260PES00 (160-3435-23), L050261PRS00 (160-3435-24), L050262PES00 (160-3435-25), L050263PES00 (160-3435-26), L050264PRS00 (160-3435-27), L050265PES00 (160-3435-28), L050266PUB00 (160-3435-29), L050267PUB00 (160-3435-30) and L050268PUB00 (160-3435-31) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 08/22/2013.

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

#### RADIUM-226 & OTHER GAMMA EMITTERS (GS)

Samples L050190TUB00 (160-3435-1), L050191TUB00 (160-3435-2), L050192TUB00 (160-3435-3), L050193TUB00 (160-3435-4), L050194TUB00 (160-3435-5), L050195TUB00 (160-3435-6), L050196TUB00 (160-3435-7), L050197TUB00 (160-3435-8), L050247PRS00 (160-3435-9), L050248PES00 (160-3435-10), L050249PRS00 (160-3435-11), L050250PES00 (160-3435-12), L050251PRS00 (160-3435-13), L050252PES00 (160-3435-14), L050253PES00 (160-3435-15), L050254PES00 (160-3435-16), L050255PES00 (160-3435-17), L050256PRS00 (160-3435-18), L050257PES00 (160-3435-19), L050258PES00 (160-3435-20), L050259PRQ00 (160-3435-21), L050259PRS00 (160-3435-22), L050260PES00 (160-3435-23), L050261PRS00 (160-3435-24), L050262PES00 (160-3435-25), L050263PES00 (160-3435-26), L050264PRS00 (160-3435-27), L050265PES00 (160-3435-28), L050266PUB00 (160-3435-29), L050267PUB00 (160-3435-30) and L050268PUB00 (160-3435-31) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 08/21/2013, prepared on 08/23/2013 and analyzed on 08/23/2013, 08/25/2013 and 08/28/2013.

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

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.

<b>Chain of Custody ID No.</b> F-082013-01 <b>Page</b> 1/1				<b>Requested Analysis</b>										<b>Laboratory Name:</b> TA-MO				
<b>Project Name:</b> Westinghouse Electric Company				<b>Comp (C) or Grab (G)</b>	<b>Gamma Spec</b>	<b>Isotopic Uranium</b>	<b>Tc-99</b>	<b>Gamma Spec (21 day ingrow for Ra-226)</b>								<b>Total Containers</b>	<b>Laboratory Address:</b> 13715 Rider Trail North	
<b>Contact Person:</b> Gerald Rood																	<b>Phone No.</b> 314-298-8566	
<b>Phone Number:</b> 314-810-3382																	<b>Laboratory Contact Person:</b> Joe Walker	
<b>Sampler Name</b> Thomas Yardy																	<b>Phone No.</b> 708-870-8453	
																<b>Turn Around Time</b>		
																Rush (7 days)		
																Remarks		
Sample ID	Date	Time	Matrix															
L050190TUB00	8/19/2013	13:45	S	C	X		X	X								1	LSA 05-01 Bias	
L050191TUB00	8/19/2013	13:55	S	C	X		X	X								1		
L050192TUB00	8/19/2013	14:05	S	C	X		X	X								1		
L050193TUB00	8/19/2013	14:15	S	C	X		X	X								1		
L050194TUB00	8/19/2013	14:25	S	C	X		X	X								1		
L050195TUB00	8/19/2013	14:35	S	C	X		X	X								1		
L050196TUB00	8/19/2013	14:45	S	C	X		X	X								1		
L050197TUB00	8/19/2013	14:55	S	C	X		X	X								1	LSA 05-01 Bias	
<b>Relinquished by:</b> C. J. WEC		<b>Date/Time</b> 8-20-13 1600		<b>Received by:</b> Joe Rood		<b>Date/Time</b> 8-20 1609		<b>Total</b> 8		<b>Cooler Temperature:</b> Ambient								
<b>Company Name:</b> WEC				<b>Company Name:</b> CROSSROADS				<b>Cooler ID:</b> 0820-02		<b>Shipper and Number:</b>								
<b>Received by:</b>		<b>Date/Time</b>		<b>Relinquished by:</b>		<b>Date/Time</b>		<b>Comments:</b> Please re-analyze samples after 21-day ingrowth period.										
<b>Company Name:</b>				<b>Company Name:</b>														
<b>Relinquished by:</b>		<b>Date/Time</b>		<b>Received by:</b>		<b>Date/Time</b>		<b>Verified By:</b>										
<b>Company Name:</b>				<b>Company Name:</b>														

W  
A  
C  
S

## Hematite Decommissioning Project

Procedure HDP-PR-QA-006, Chain of Custody

Revision: 3

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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-081913-01 Page 1/2				Requested Analysis										Laboratory Name:			
Project Name:				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)							Total Containers	Laboratory Address:	
Westinghouse Electric Company																13715 Rider Trail North	
Contact Person:															Phone No.		
Gerald Rood															314-298-8566		
Phone Number:															Laboratory Contact Person:		
314-810-3382															Joe Walker		
Sampler Name															Phone No.		
Scott Jenkins															708-870-8453		
															Turn Around Time		
															Rush (7 days)		
															Remarks		
Sample ID	Date	Time	Matrix														
L050247PRS00	8/16/2013	15:40	S	C	X		X	X							1	LSA 05-02 Sys	
L050248PES00	8/16/2013	15:55	S	C	X		X	X							1		
L050249PRS00	8/16/2013	14:15	S	C	X		X	X							1		
L050250PES00	8/16/2013	14:25	S	C	X		X	X							1		
L050251PRS00	8/19/2013	8:35	S	C	X		X	X							1		
L050252PES00	8/19/2013	10:15	S	C	X		X	X							1		
L050253PES00	8/19/2013	8:45	S	C	X		X	X							1		
L050254PES00	8/19/2013	8:40	S	C	X		X	X							1		
L050255PES00	8/16/2013	13:50	S	C	X		X	X							1		
L050256PRS00	8/19/2013	8:55	S	C	X		X	X							1		
L050257PES00	8/19/2013	10:20	S	C	X		X	X							1		
L050258PES00	8/16/2013	13:40	S	C	X		X	X							1	LSA 05-02 Sys	
Relinquished by: <i>[Signature]</i>				Date/Time: 8-20-13 1600	Received by: <i>[Signature]</i>				Date/Time: 8-20 1609	Total: 23		Cooler Temperature: Ambient					
Company Name: WEC					Company Name: Crossroads					Cooler ID: 0816-02 / 0820-02		Shipper and Number: Cooler ID					
Received by: <i>[Signature]</i>				Date/Time:	Relinquished by: <i>[Signature]</i>				Date/Time: 8-20 1843	Comments: Please re-analyze samples after 21-day ingrowth period.							
Company Name:					Company Name: Crossroads												
Relinquished by: <i>[Signature]</i>				Date/Time:	Received by: <i>[Signature]</i>				Date/Time: 8-20-13 1843								
Company Name:					Company Name: TESTAMERICA					Verified By: <i>[Signature]</i>							

## Hematite Decommissioning Project

Procedure HDP-PR-QA-006, Chain of Custody

Revision: 3

Page 1 of 1

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-081913-01 Page 2/2				Requested Analysis										Laboratory Name:			
Project Name:				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)							Total Containers	TA-MO	
Westinghouse Electric Company																Laboratory Address:	
Contact Person:																13715 Rider Trail North	
Phone Number:																Phone No.	
314-810-3382																314-298-8566	
Sampler Name				Laboratory Contact Person:													
Scott Jenkins				Joe Walker													
				Phone No.													
				708-870-8453													
				Turn Around Time													
				Rush (7 days)													
				Remarks													
Sample ID	Date	Time	Matrix														
L050259PRQ00	8/16/2013	15:20	S	C	X		X	X							1	LSA 05-02 Sys	
L050259PRS00	8/16/2013	15:20	S	C	X		X	X							1		
L050260PES00	8/16/2013	15:30	S	C	X		X	X							1		
L050261PRS00	8/19/2013	9:05	S	C	X		X	X							1		
L050262PES00	8/19/2013	10:30	S	C	X		X	X							1		
L050263PES00	8/16/2013	13:30	S	C	X		X	X							1		
L050264PRS00	8/16/2013	14:50	S	C	X		X	X							1		
L050265PES00	8/16/2013	15:00	S	C	X		X	X							1	LSA 05-02 Sys	
L050266PUB00	8/16/2013	11:50	S	C	X		X	X							1	LSA 05-02 Bias	
L050267PUB00	8/16/2013	11:55	S	C	X		X	X							1	LSA 05-02 Bias	
L050268PUB00	8/16/2013	12:00	S	C	X		X	X							1	LSA 05-02 Bias	
Relinquished by: <i>[Signature]</i>				Date/Time: 8-20-13 1600	Received by: <i>[Signature]</i>				Date/Time: 8-20 16:04	Total: 23	Cooler Temperature: Ambient						
Company Name: WEC					Company Name: Crossroads					Cooler ID: 0816-02/	Shipper and Number: 0820-02						
Received by:				Date/Time:	Relinquished by: <i>[Signature]</i>				Date/Time: 8-20 18:43	Comments: Please re-analyze samples after 21-day ingrowth period.							
Company Name:					Company Name: Crossroads												
Relinquished by:				Date/Time:	Received by: <i>[Signature]</i>				Date/Time: 8-20-13 18:43	Verified By: <i>[Signature]</i>							
Company Name:					Company Name: TESTAmerica												

## Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3435-2

Login Number: 3435

List Source: TestAmerica St. Louis

List Number: 1

Creator: Daniels, Brian J

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: 160-3435-2

### 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)
Dil Fac	Dilution Factor
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: 160-3435-2

Method	Method Description	Protocol	Laboratory
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL

**Protocol References:**

DOE = U.S. Department of Energy

**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: 160-3435-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3435-1	L050190TUB00	Solid	08/19/13 13:45	08/20/13 16:06
160-3435-2	L050191TUB00	Solid	08/19/13 13:55	08/20/13 16:06
160-3435-3	L050192TUB00	Solid	08/19/13 14:05	08/20/13 16:06
160-3435-4	L050193TUB00	Solid	08/19/13 14:15	08/20/13 16:06
160-3435-5	L050194TUB00	Solid	08/19/13 14:25	08/20/13 16:06
160-3435-6	L050195TUB00	Solid	08/19/13 14:35	08/20/13 16:06
160-3435-7	L050196TUB00	Solid	08/19/13 14:45	08/20/13 16:06
160-3435-8	L050197TUB00	Solid	08/19/13 14:55	08/20/13 16:06
160-3435-9	L050247PRS00	Solid	08/16/13 15:40	08/20/13 16:06
160-3435-10	L050248PES00	Solid	08/16/13 15:55	08/20/13 16:06
160-3435-11	L050249PRS00	Solid	08/16/13 14:15	08/20/13 16:06
160-3435-12	L050250PES00	Solid	08/16/13 14:25	08/20/13 16:06
160-3435-13	L050251PRS00	Solid	08/19/13 08:35	08/20/13 16:06
160-3435-14	L050252PES00	Solid	08/19/13 10:15	08/20/13 16:06
160-3435-15	L050253PES00	Solid	08/19/13 08:45	08/20/13 16:06
160-3435-16	L050254PES00	Solid	08/19/13 08:40	08/20/13 16:06
160-3435-17	L050255PES00	Solid	08/16/13 13:50	08/20/13 16:06
160-3435-18	L050256PRS00	Solid	08/19/13 08:55	08/20/13 16:06
160-3435-19	L050257PES00	Solid	08/19/13 10:20	08/20/13 16:06
160-3435-20	L050258PES00	Solid	08/16/13 13:40	08/20/13 16:06
160-3435-21	L050259PRQ00	Solid	08/19/13 15:20	08/20/13 16:06
160-3435-22	L050259PRS00	Solid	08/16/13 15:20	08/20/13 16:06
160-3435-23	L050260PES00	Solid	08/16/13 15:30	08/20/13 16:06
160-3435-24	L050261PRS00	Solid	08/16/13 09:05	08/20/13 16:06
160-3435-25	L050262PES00	Solid	08/19/13 10:30	08/20/13 16:06
160-3435-26	L050263PES00	Solid	08/19/13 13:30	08/20/13 16:06
160-3435-27	L050264PRS00	Solid	08/16/13 14:50	08/20/13 16:06
160-3435-28	L050265PES00	Solid	08/16/13 15:00	08/20/13 16:06
160-3435-29	L050266PUB00	Solid	08/16/13 11:50	08/20/13 16:06
160-3435-30	L050267PUB00	Solid	08/16/13 11:55	08/20/13 16:06
160-3435-31	L050268PUB00	Solid	08/16/13 12:00	08/20/13 16:06

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050190TUB00**

**Lab Sample ID: 160-3435-1**

**Date Collected: 08/19/13 13:45**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.874		0.129	0.157		0.109	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Bismuth 212	1.57		0.484	0.511		0.385	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Bismuth 214	0.963		0.107	0.147		0.0725	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Lead 212	0.820		0.0725	0.129		0.0786	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Lead 214	1.06		0.0892	0.141		0.0784	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Potassium 40	17.3		1.10	2.08		0.342	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Protactinium 231	0.184	U	0.166	0.167		1.03	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Radium 226	0.963		0.107	0.147	1.00	0.0725	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Thorium 232	0.874		0.129	0.157		0.109	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Thorium 234	0.986		0.566	0.575		0.760	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Uranium 235	0.0664	U	0.140	0.140		0.244	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Americium 241	0.0736	U	0.0569	0.0574		0.0757	pCi/g	08/23/13 09:35	09/13/13 16:24	1
Protactinium 234m	0.499	U	2.90	2.90		5.09	pCi/g	08/23/13 09:35	09/13/13 16:24	1

**Client Sample ID: L050191TUB00**

**Lab Sample ID: 160-3435-2**

**Date Collected: 08/19/13 13:55**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.785		0.115	0.140		0.110	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Bismuth 212	0.289	U	0.335	0.337		0.548	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Bismuth 214	0.949		0.104	0.143		0.0596	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Lead 212	0.791		0.0693	0.124		0.0576	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Lead 214	1.10		0.101	0.152		0.0737	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Potassium 40	13.5		1.11	1.77		0.287	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Protactinium 231	0.313	U	0.189	0.192		1.14	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Radium 226	0.949		0.104	0.143	1.00	0.0596	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Thorium 232	0.785		0.115	0.140		0.110	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Thorium 234	0.988		0.299	0.316		0.767	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Uranium 235	0.136	U	0.137	0.137		0.184	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Americium 241	-0.0236	U	0.115	0.115		0.100	pCi/g	08/23/13 09:35	09/13/13 16:25	1
Protactinium 234m	4.40	U	2.25	2.29		5.19	pCi/g	08/23/13 09:35	09/13/13 16:25	1

**Client Sample ID: L050192TUB00**

**Lab Sample ID: 160-3435-3**

**Date Collected: 08/19/13 14:05**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.249		0.0966	0.0999		0.0785	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Bismuth 212	0.0807	U	0.275	0.276		0.490	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Bismuth 214	0.782		0.112	0.138		0.0723	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Lead 212	0.244		0.0482	0.0576		0.0558	pCi/g	08/23/13 09:35	09/13/13 16:26	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050192TUB00**

**Lab Sample ID: 160-3435-3**

Date Collected: 08/19/13 14:05

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 214	0.964		0.0947	0.138		0.0612	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Potassium 40	2.94		0.595	0.667		0.383	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Protactinium 231	0.159	U	0.410	0.411		0.876	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Radium 226	0.782		0.112	0.138	1.00	0.0723	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Thorium 232	0.249		0.0966	0.0999		0.0785	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Thorium 234	1.50		0.453	0.480		0.859	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Uranium 235	0.347		0.146	0.151		0.167	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Americium 241	0.0279	U	0.0464	0.0465		0.0774	pCi/g	08/23/13 09:35	09/13/13 16:26	1
Protactinium 234m	0.468	U	3.19	3.19		5.82	pCi/g	08/23/13 09:35	09/13/13 16:26	1

**Client Sample ID: L050193TUB00**

**Lab Sample ID: 160-3435-4**

Date Collected: 08/19/13 14:15

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.672		0.0944	0.117		0.0951	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Bismuth 212	1.07		0.327	0.345		0.262	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Bismuth 214	0.939		0.104	0.142		0.0712	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Lead 212	0.741		0.0625	0.114		0.0532	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Lead 214	0.983		0.0774	0.128		0.0691	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Potassium 40	12.0		0.924	1.53		0.228	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Protactinium 231	0.278	U	0.236	0.238		0.932	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Radium 226	0.939		0.104	0.142	1.00	0.0712	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Thorium 232	0.672		0.0944	0.117		0.0951	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Thorium 234	1.12		0.327	0.347		0.833	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Uranium 235	0.291		0.109	0.113		0.153	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Americium 241	-0.00487	U	0.0383	0.0383		0.0654	pCi/g	08/23/13 09:35	09/13/13 16:27	1
Protactinium 234m	1.28	U	2.60	2.60		4.53	pCi/g	08/23/13 09:35	09/13/13 16:27	1

**Client Sample ID: L050194TUB00**

**Lab Sample ID: 160-3435-5**

Date Collected: 08/19/13 14:25

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.872		0.123	0.152		0.104	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Bismuth 212	1.11		0.346	0.365		0.320	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Bismuth 214	0.982		0.106	0.147		0.0711	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Lead 212	0.788		0.0707	0.124		0.0753	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Lead 214	1.07		0.0890	0.143		0.0697	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Potassium 40	16.0		1.04	1.94		0.266	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Protactinium 231	0.463	U	0.365	0.368		1.19	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Radium 226	0.982		0.106	0.147	1.00	0.0711	pCi/g	08/23/13 09:35	09/13/13 17:06	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050194TUB00**

**Lab Sample ID: 160-3435-5**

**Date Collected: 08/19/13 14:25**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
<b>Thorium 232</b>	<b>0.872</b>		0.123	0.152		0.104	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Thorium 234	0.447	U	0.611	0.613		1.02	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Uranium 235	0.0708	U	0.136	0.136		0.216	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Americium 241	-0.00259	U	0.0637	0.0637		0.108	pCi/g	08/23/13 09:35	09/13/13 17:06	1
Protactinium 234m	2.27	U	2.83	2.84		4.65	pCi/g	08/23/13 09:35	09/13/13 17:06	1

**Client Sample ID: L050195TUB00**

**Lab Sample ID: 160-3435-6**

**Date Collected: 08/19/13 14:35**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.678</b>		0.111	0.130		0.114	pCi/g	08/23/13 09:35	09/13/13 17:07	1
Bismuth 212	0.385	U	0.352	0.354		0.559	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Bismuth 214</b>	<b>0.787</b>		0.102	0.131		0.0625	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Lead 212</b>	<b>0.586</b>		0.0651	0.0999		0.0629	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Lead 214</b>	<b>0.810</b>		0.0836	0.119		0.0898	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Potassium 40</b>	<b>10.5</b>		1.09	1.53		0.493	pCi/g	08/23/13 09:35	09/13/13 17:07	1
Protactinium 231	0.147	U	0.241	0.242		0.979	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Radium 226</b>	<b>0.787</b>		0.102	0.131	1.00	0.0625	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Thorium 232</b>	<b>0.678</b>		0.111	0.130		0.114	pCi/g	08/23/13 09:35	09/13/13 17:07	1
<b>Thorium 234</b>	<b>1.03</b>		0.605	0.615		0.793	pCi/g	08/23/13 09:35	09/13/13 17:07	1
Uranium 235	0.0837	U	0.146	0.147		0.231	pCi/g	08/23/13 09:35	09/13/13 17:07	1
Americium 241	0.0289	U	0.0603	0.0604		0.101	pCi/g	08/23/13 09:35	09/13/13 17:07	1
Protactinium 234m	4.18	U	2.60	2.63		6.21	pCi/g	08/23/13 09:35	09/13/13 17:07	1

**Client Sample ID: L050196TUB00**

**Lab Sample ID: 160-3435-7**

**Date Collected: 08/19/13 14:45**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.573</b>		0.0859	0.104		0.0942	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Bismuth 212</b>	<b>0.960</b>		0.311	0.327		0.252	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Bismuth 214</b>	<b>0.765</b>		0.0885	0.119		0.0564	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Lead 212</b>	<b>0.630</b>		0.0557	0.0988		0.0479	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Lead 214</b>	<b>0.876</b>		0.0773	0.119		0.0492	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Potassium 40</b>	<b>14.0</b>		0.963	1.73		0.212	pCi/g	08/23/13 09:35	09/13/13 17:08	1
Protactinium 231	0.270	U	0.227	0.229		0.854	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Radium 226</b>	<b>0.765</b>		0.0885	0.119	1.00	0.0564	pCi/g	08/23/13 09:35	09/13/13 17:08	1
<b>Thorium 232</b>	<b>0.573</b>		0.0859	0.104		0.0942	pCi/g	08/23/13 09:35	09/13/13 17:08	1
Thorium 234	0.487	U	0.254	0.259		0.834	pCi/g	08/23/13 09:35	09/13/13 17:08	1
Uranium 235	0.0688	U	0.101	0.101		0.156	pCi/g	08/23/13 09:35	09/13/13 17:08	1
Americium 241	0.0178	U	0.0460	0.0460		0.0771	pCi/g	08/23/13 09:35	09/13/13 17:08	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050196TUB00**

**Lab Sample ID: 160-3435-7**

**Date Collected: 08/19/13 14:45**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Protactinium 234m	2.03	U	2.26	2.26		3.74	pCi/g	08/23/13 09:35	09/13/13 17:08	1

**Client Sample ID: L050197TUB00**

**Lab Sample ID: 160-3435-8**

**Date Collected: 08/19/13 14:55**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.656		0.109	0.126		0.0803	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Bismuth 212	0.305	U	0.299	0.301		0.480	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Bismuth 214	0.877		0.103	0.134		0.0671	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Lead 212	0.685		0.0657	0.0987		0.0594	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Lead 214	0.945		0.0914	0.129		0.0775	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Potassium 40	13.5		1.07	1.69		0.361	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Protactinium 231	0.309	U	0.400	0.401		1.08	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Radium 226	0.877		0.103	0.134	1.00	0.0671	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Thorium 232	0.656		0.109	0.126		0.0803	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Thorium 234	1.22		0.662	0.673		0.812	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Uranium 235	0.0608	U	0.153	0.153		0.249	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Americium 241	-0.00606	U	0.0820	0.0820		0.0979	pCi/g	08/23/13 09:35	09/13/13 16:29	1
Protactinium 234m	1.34	U	2.77	2.77		4.76	pCi/g	08/23/13 09:35	09/13/13 16:29	1

**Client Sample ID: L050247PRS00**

**Lab Sample ID: 160-3435-9**

**Date Collected: 08/16/13 15:40**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.09		0.152	0.185		0.133	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Bismuth 212	1.26		0.425	0.442		0.403	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Bismuth 214	1.15		0.125	0.167		0.0827	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Lead 212	1.04		0.0798	0.138		0.0659	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Lead 214	1.29		0.116	0.170		0.0948	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Potassium 40	21.3		1.36	2.47		0.369	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Protactinium 231	-0.626	U	0.810	0.813		1.34	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Radium 226	1.15		0.125	0.167	1.00	0.0827	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Thorium 232	1.09		0.152	0.185		0.133	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Thorium 234	1.79		0.774	0.793		0.974	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Uranium 235	0.356		0.188	0.191		0.227	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Americium 241	-0.00710	U	0.103	0.103		0.115	pCi/g	08/23/13 09:35	09/13/13 17:09	1
Protactinium 234m	2.51	U	3.80	3.81		6.35	pCi/g	08/23/13 09:35	09/13/13 17:09	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050248PES00**

**Lab Sample ID: 160-3435-10**

**Date Collected: 08/16/13 15:55**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.18		0.130	0.173		0.131	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Bismuth 212	1.32		0.507	0.523		0.469	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Bismuth 214	1.23		0.123	0.172		0.0810	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Lead 212	1.07		0.0853	0.143		0.0898	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Lead 214	1.37		0.113	0.174		0.0931	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Potassium 40	22.1		1.27	2.48		0.288	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Protactinium 231	0.320	U	0.203	0.205		1.29	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Radium 226	1.23		0.123	0.172	1.00	0.0810	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Thorium 232	1.18		0.130	0.173		0.131	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Thorium 234	0.745	U	0.392	0.399		1.10	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Uranium 235	0.143	U	0.170	0.171		0.293	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Americium 241	-0.0114	U	0.0658	0.0658		0.111	pCi/g	08/23/13 09:35	09/13/13 17:43	1
Protactinium 234m	2.51	U	3.15	3.16		5.48	pCi/g	08/23/13 09:35	09/13/13 17:43	1

**Client Sample ID: L050249PRS00**

**Lab Sample ID: 160-3435-11**

**Date Collected: 08/16/13 14:15**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.07		0.130	0.166		0.132	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Bismuth 212	0.846		0.406	0.414		0.574	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Bismuth 214	1.24		0.128	0.176		0.0693	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Lead 212	1.04		0.0824	0.139		0.0632	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Lead 214	1.28		0.126	0.177		0.0897	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Potassium 40	20.3		1.44	2.44		0.322	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Protactinium 231	0.342	U	0.268	0.270		1.44	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Radium 226	1.24		0.128	0.176	1.00	0.0693	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Thorium 232	1.07		0.130	0.166		0.132	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Thorium 234	1.48		0.646	0.662		0.868	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Uranium 235	0.179	U	0.174	0.174		0.255	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Americium 241	-0.00803	U	0.321	0.321		0.112	pCi/g	08/23/13 09:35	09/13/13 17:44	1
Protactinium 234m	1.60	U	3.95	3.95		6.82	pCi/g	08/23/13 09:35	09/13/13 17:44	1

**Client Sample ID: L050250PES00**

**Lab Sample ID: 160-3435-12**

**Date Collected: 08/16/13 14:25**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.32		0.198	0.240		0.155	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Bismuth 212	1.49		0.515	0.538		0.448	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Bismuth 214	1.20		0.150	0.196		0.101	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Lead 212	1.16		0.0936	0.177		0.0809	pCi/g	08/23/13 09:35	09/13/13 17:45	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050250PES00**

**Lab Sample ID: 160-3435-12**

Date Collected: 08/16/13 14:25

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Lead 214	1.32		0.130	0.189		0.0952	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Potassium 40	19.3		1.52	2.49		0.540	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Protactinium 231	0.153	U	0.532	0.532		0.921	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Radium 226	1.20		0.150	0.196	1.00	0.101	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Thorium 232	1.32		0.198	0.240		0.155	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Thorium 234	0.770	U	0.399	0.407		1.04	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Uranium 235	0.0397	U	0.208	0.208		0.322	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Americium 241	0.0375	U	0.0770	0.0771		0.128	pCi/g	08/23/13 09:35	09/13/13 17:45	1
Protactinium 234m	2.85	U	3.93	3.94		6.52	pCi/g	08/23/13 09:35	09/13/13 17:45	1

**Client Sample ID: L050251PRS00**

**Lab Sample ID: 160-3435-13**

Date Collected: 08/19/13 08:35

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.34		0.145	0.194		0.0896	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Bismuth 212	1.40		0.514	0.532		0.500	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Bismuth 214	1.49		0.149	0.207		0.103	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Lead 212	1.36		0.0909	0.172		0.0705	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Lead 214	1.62		0.122	0.198		0.0672	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Potassium 40	25.3		1.50	2.86		0.373	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Protactinium 231	0.513	U	0.257	0.262		1.39	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Radium 226	1.49		0.149	0.207	1.00	0.103	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Thorium 232	1.34		0.145	0.194		0.0896	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Thorium 234	0.831	U	0.318	0.329		0.856	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Uranium 235	0.231	U	0.140	0.142		0.280	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Americium 241	0.0149	U	0.0657	0.0657		0.110	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Protactinium 234m	-0.583	U	21.8	21.8		4.77	pCi/g	08/23/13 09:35	09/13/13 17:46	1

**Client Sample ID: L050252PES00**

**Lab Sample ID: 160-3435-14**

Date Collected: 08/19/13 10:15

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.25		0.167	0.206		0.173	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Bismuth 212	1.64		0.488	0.513		0.423	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Bismuth 214	1.47		0.145	0.204		0.0965	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Lead 212	1.36		0.0940	0.174		0.0800	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Lead 214	1.63		0.129	0.204		0.105	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Potassium 40	26.6		1.56	3.00		0.459	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Protactinium 231	0.638	U	0.327	0.333		1.52	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Radium 226	1.47		0.145	0.204	1.00	0.0965	pCi/g	08/23/13 09:35	09/13/13 17:46	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050252PES00**

**Lab Sample ID: 160-3435-14**

**Date Collected: 08/19/13 10:15**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Thorium 232</b>	<b>1.25</b>		0.167	0.206		0.173	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Thorium 234	1.03	U	0.387	0.400		1.24	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Uranium 235	0.119	U	0.193	0.193		0.315	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Americium 241	0.00973	U	0.0741	0.0741		0.126	pCi/g	08/23/13 09:35	09/13/13 17:46	1
Protactinium 234m	0.814	U	3.64	3.64		7.11	pCi/g	08/23/13 09:35	09/13/13 17:46	1

**Client Sample ID: L050253PES00**

**Lab Sample ID: 160-3435-15**

**Date Collected: 08/19/13 08:45**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Actinium 228</b>	<b>1.26</b>		0.205	0.242		0.143	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Bismuth 212</b>	<b>2.36</b>		0.715	0.756		0.485	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Bismuth 214</b>	<b>1.19</b>		0.175	0.214		0.116	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Lead 212</b>	<b>1.13</b>		0.141	0.203		0.142	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Lead 214</b>	<b>1.39</b>		0.176	0.228		0.118	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Potassium 40</b>	<b>19.2</b>		1.99	2.80		0.946	pCi/g	08/23/13 09:35	09/13/13 17:47	1
Protactinium 231	0.473	U	0.375	0.379		2.66	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Radium 226</b>	<b>1.19</b>		0.175	0.214	1.00	0.116	pCi/g	08/23/13 09:35	09/13/13 17:47	1
<b>Thorium 232</b>	<b>1.26</b>		0.205	0.242		0.143	pCi/g	08/23/13 09:35	09/13/13 17:47	1
Thorium 234	1.16	U	0.613	0.625		2.34	pCi/g	08/23/13 09:35	09/13/13 17:47	1
Uranium 235	0.250	U	0.285	0.286		0.502	pCi/g	08/23/13 09:35	09/13/13 17:47	1
Americium 241	0.0867	U	0.146	0.146		0.243	pCi/g	08/23/13 09:35	09/13/13 17:47	1
Protactinium 234m	1.93	U	3.85	3.85		14.4	pCi/g	08/23/13 09:35	09/13/13 17:47	1

**Client Sample ID: L050254PES00**

**Lab Sample ID: 160-3435-16**

**Date Collected: 08/19/13 08:40**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Actinium 228</b>	<b>1.31</b>		0.150	0.197		0.154	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Bismuth 212</b>	<b>1.14</b>		0.495	0.508		0.514	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Bismuth 214</b>	<b>1.24</b>		0.138	0.183		0.0963	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Lead 212</b>	<b>1.35</b>		0.0921	0.224		0.0727	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Lead 214</b>	<b>1.54</b>		0.112	0.202		0.0902	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Potassium 40</b>	<b>23.0</b>		1.44	2.65		0.459	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Protactinium 231	-0.784	U	1.00	1.01		1.65	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Radium 226</b>	<b>1.24</b>		0.138	0.183	1.00	0.0963	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Thorium 232</b>	<b>1.31</b>		0.150	0.197		0.154	pCi/g	08/23/13 09:35	09/13/13 18:19	1
<b>Thorium 234</b>	<b>1.49</b>		0.834	0.846		1.04	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Uranium 235	0.0853	U	0.178	0.178		0.308	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Americium 241	-0.0301	U	0.0713	0.0714		0.119	pCi/g	08/23/13 09:35	09/13/13 18:19	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050254PES00**

**Lab Sample ID: 160-3435-16**

**Date Collected: 08/19/13 08:40**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Protactinium 234m	5.97	U	3.51	3.55		7.12	pCi/g	08/23/13 09:35	09/13/13 18:19	1

**Client Sample ID: L050255PES00**

**Lab Sample ID: 160-3435-17**

**Date Collected: 08/16/13 13:50**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.20		0.174	0.209		0.136	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Bismuth 212	1.45		0.513	0.532		0.484	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Bismuth 214	1.35		0.136	0.189		0.0954	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Lead 212	1.16		0.0933	0.156		0.0988	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Lead 214	1.46		0.133	0.194		0.100	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Potassium 40	23.7		1.40	2.67		0.401	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Protactinium 231	0.801	U	0.360	0.369		1.43	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Radium 226	1.35		0.136	0.189	1.00	0.0954	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Thorium 232	1.20		0.174	0.209		0.136	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Thorium 234	1.40		0.811	0.823		1.01	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Uranium 235	0.0514	U	0.165	0.165		0.312	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Americium 241	-0.0104	U	0.0694	0.0694		0.117	pCi/g	08/23/13 09:35	09/13/13 18:19	1
Protactinium 234m	1.47	U	3.53	3.53		6.04	pCi/g	08/23/13 09:35	09/13/13 18:19	1

**Client Sample ID: L050256PRS00**

**Lab Sample ID: 160-3435-18**

**Date Collected: 08/19/13 08:55**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.34		0.158	0.204		0.160	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Bismuth 212	1.43		0.460	0.480		0.431	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Bismuth 214	1.50		0.162	0.218		0.112	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Lead 212	1.20		0.0934	0.160		0.0779	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Lead 214	1.64		0.130	0.205		0.115	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Potassium 40	23.9		1.69	2.86		0.592	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Protactinium 231	0.595	U	0.270	0.276		1.46	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Radium 226	1.50		0.162	0.218	1.00	0.112	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Thorium 232	1.34		0.158	0.204		0.160	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Thorium 234	1.34		0.810	0.820		1.06	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Uranium 235	0.140	U	0.173	0.174		0.297	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Americium 241	-0.0181	U	0.194	0.194		0.120	pCi/g	08/23/13 09:35	09/13/13 18:20	1
Protactinium 234m	1.27	U	3.87	3.88		6.77	pCi/g	08/23/13 09:35	09/13/13 18:20	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050257PES00**

**Lab Sample ID: 160-3435-19**

Date Collected: 08/19/13 10:20

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.30		0.187	0.225		0.166	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Bismuth 212	0.923		0.529	0.536		0.779	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Bismuth 214	1.41		0.166	0.215		0.105	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Lead 212	1.36		0.113	0.185		0.103	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Lead 214	1.38		0.147	0.199		0.107	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Potassium 40	25.4		1.91	3.11		0.591	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Protactinium 231	0.499	U	0.327	0.330		2.02	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Radium 226	1.41		0.166	0.215	1.00	0.105	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Thorium 232	1.30		0.187	0.225		0.166	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Thorium 234	1.07	U	0.498	0.508		1.26	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Uranium 235	0.145	U	0.220	0.221		0.365	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Americium 241	0.00862	U	0.0832	0.0832		0.141	pCi/g	08/23/13 09:35	09/13/13 18:21	1
Protactinium 234m	-0.274	U	4.97	4.97		8.95	pCi/g	08/23/13 09:35	09/13/13 18:21	1

**Client Sample ID: L050258PES00**

**Lab Sample ID: 160-3435-20**

Date Collected: 08/16/13 13:40

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.32		0.144	0.193		0.106	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Bismuth 212	1.45		0.470	0.491		0.428	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Bismuth 214	1.33		0.132	0.185		0.0825	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Lead 212	1.40		0.0906	0.176		0.0675	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Lead 214	1.58		0.114	0.190		0.0892	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Potassium 40	24.4		1.49	2.78		0.455	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Protactinium 231	-0.801	U	0.842	0.846		1.38	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Radium 226	1.33		0.132	0.185	1.00	0.0825	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Thorium 232	1.32		0.144	0.193		0.106	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Thorium 234	1.49		0.771	0.784		1.00	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Uranium 235	0.111	U	0.170	0.170		0.288	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Americium 241	0.00492	U	0.0705	0.0705		0.119	pCi/g	08/23/13 09:35	09/13/13 18:22	1
Protactinium 234m	1.81	U	3.91	3.92		6.74	pCi/g	08/23/13 09:35	09/13/13 18:22	1

**Client Sample ID: L050259PRQ00**

**Lab Sample ID: 160-3435-21**

Date Collected: 08/19/13 15:20

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.08		0.232	0.257		0.312	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Bismuth 212	0.999	U	1.09	1.09		1.75	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Bismuth 214	1.46		0.251	0.294		0.149	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Lead 212	1.19		0.171	0.230		0.153	pCi/g	08/23/13 11:49	09/13/13 11:05	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050259PRQ00**

**Lab Sample ID: 160-3435-21**

Date Collected: 08/19/13 15:20

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Lead 214	1.49		0.233	0.280		0.154	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Potassium 40	16.9		2.46	3.00		1.01	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Protactinium 231	0.184	U	0.252	0.253		3.43	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Radium 226	1.46		0.251	0.294	1.00	0.149	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Thorium 232	1.08		0.232	0.257		0.312	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Thorium 234	0.736	U	0.657	0.662		3.08	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Uranium 235	0.229	U	0.338	0.339		0.506	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Americium 241	-0.0378	U	28.7	28.7		0.316	pCi/g	08/23/13 11:49	09/13/13 11:05	1
Protactinium 234m	-0.931	U	10.5	10.5		19.2	pCi/g	08/23/13 11:49	09/13/13 11:05	1

**Client Sample ID: L050259PRS00**

**Lab Sample ID: 160-3435-22**

Date Collected: 08/16/13 15:20

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.09		0.258	0.281		0.298	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Bismuth 212	1.83		0.705	0.730		0.608	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Bismuth 214	1.29		0.226	0.263		0.171	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Lead 212	1.16		0.142	0.207		0.130	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Lead 214	1.40		0.167	0.222		0.160	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Potassium 40	19.6		2.12	2.92		1.04	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Protactinium 231	0.853	U	0.503	0.511		2.86	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Radium 226	1.29		0.226	0.263	1.00	0.171	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Thorium 232	1.09		0.258	0.281		0.298	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Thorium 234	0.996	U	0.593	0.602		2.28	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Uranium 235	0.0677	U	0.209	0.209		0.657	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Americium 241	-0.0209	U	0.159	0.159		0.271	pCi/g	08/23/13 11:49	09/13/13 11:06	1
Protactinium 234m	3.17	U	5.01	5.02		8.48	pCi/g	08/23/13 11:49	09/13/13 11:06	1

**Client Sample ID: L050260PES00**

**Lab Sample ID: 160-3435-23**

Date Collected: 08/16/13 15:30

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.26		0.207	0.240		0.150	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Bismuth 212	1.41		0.564	0.580		0.542	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Bismuth 214	1.55		0.159	0.219		0.113	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Lead 212	1.24		0.0864	0.159		0.0750	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Lead 214	1.62		0.110	0.192		0.0887	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Potassium 40	22.7		1.41	2.61		0.501	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Protactinium 231	0.704	U	0.297	0.305		1.48	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Radium 226	1.55		0.159	0.219	1.00	0.113	pCi/g	08/23/13 11:49	09/13/13 12:48	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050260PES00**

**Lab Sample ID: 160-3435-23**

**Date Collected: 08/16/13 15:30**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 232	1.26		0.207	0.240		0.150	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Thorium 234	1.31		0.732	0.743		0.957	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Uranium 235	0.0193	U	0.131	0.131		0.327	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Americium 241	-0.0324	U	4.12	4.12		0.125	pCi/g	08/23/13 11:49	09/13/13 12:48	1
Protactinium 234m	1.74	U	3.37	3.37		5.73	pCi/g	08/23/13 11:49	09/13/13 12:48	1

**Client Sample ID: L050261PRS00**

**Lab Sample ID: 160-3435-24**

**Date Collected: 08/16/13 09:05**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.23		0.145	0.192		0.133	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Bismuth 212	1.76		0.469	0.504		0.377	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Bismuth 214	1.30		0.120	0.181		0.0777	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Lead 212	1.02		0.0838	0.156		0.0908	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Lead 214	1.53		0.108	0.192		0.0912	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Potassium 40	24.6		1.36	2.86		0.436	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Protactinium 231	0.400	U	0.222	0.226		1.32	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Radium 226	1.30		0.120	0.181	1.00	0.0777	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Thorium 232	1.23		0.145	0.192		0.133	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Thorium 234	1.39		0.833	0.846		1.02	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Uranium 235	0.205		0.127	0.129		0.201	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Americium 241	0.00518	U	0.0697	0.0697		0.117	pCi/g	08/23/13 11:49	09/13/13 12:53	1
Protactinium 234m	1.33	U	3.52	3.52		6.03	pCi/g	08/23/13 11:49	09/13/13 12:53	1

**Client Sample ID: L050262PES00**

**Lab Sample ID: 160-3435-25**

**Date Collected: 08/19/13 10:30**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.37		0.149	0.199		0.102	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Bismuth 212	1.08		0.449	0.461		0.638	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Bismuth 214	1.26		0.127	0.177		0.0835	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Lead 212	1.25		0.0903	0.162		0.0796	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Lead 214	1.41		0.127	0.187		0.0899	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Potassium 40	24.7		1.53	2.84		0.544	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Protactinium 231	0.607	U	0.432	0.436		1.50	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Radium 226	1.26		0.127	0.177	1.00	0.0835	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Thorium 232	1.37		0.149	0.199		0.102	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Thorium 234	1.42		0.376	0.401		0.943	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Uranium 235	0.190	U	0.174	0.175		0.215	pCi/g	08/23/13 11:49	09/13/13 13:40	1
Americium 241	-0.00202	U	0.0801	0.0801		0.122	pCi/g	08/23/13 11:49	09/13/13 13:40	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050262PES00**

**Lab Sample ID: 160-3435-25**

**Date Collected: 08/19/13 10:30**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Protactinium 234m	-0.0228	U	3.73	3.73		6.68	pCi/g	08/23/13 11:49	09/13/13 13:40	1

**Client Sample ID: L050263PES00**

**Lab Sample ID: 160-3435-26**

**Date Collected: 08/19/13 13:30**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.28		0.186	0.227		0.202	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Bismuth 212	2.28		0.764	0.800		0.594	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Bismuth 214	1.32		0.150	0.204		0.0898	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Lead 212	1.26		0.101	0.192		0.0873	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Lead 214	1.29		0.126	0.184		0.104	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Potassium 40	22.7		1.68	2.87		0.228	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Protactinium 231	1.34		0.534	0.554		1.20	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Radium 226	1.32		0.150	0.204	1.00	0.0898	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Thorium 232	1.28		0.186	0.227		0.202	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Thorium 234	1.05		0.378	0.394		0.930	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Uranium 235	0.151	U	0.180	0.181		0.315	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Americium 241	-0.0392	U	0.0817	0.0818		0.136	pCi/g	08/23/13 11:49	09/13/13 13:38	1
Protactinium 234m	0.896	U	4.19	4.19		7.46	pCi/g	08/23/13 11:49	09/13/13 13:38	1

**Client Sample ID: L050264PRS00**

**Lab Sample ID: 160-3435-27**

**Date Collected: 08/16/13 14:50**

**Matrix: Solid**

**Date Received: 08/20/13 16:06**

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.34		0.233	0.270		0.187	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Bismuth 212	0.510	U	0.736	0.738		1.23	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Bismuth 214	1.34		0.234	0.272		0.195	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Lead 212	1.17		0.165	0.224		0.171	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Lead 214	1.52		0.242	0.289		0.209	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Potassium 40	19.2		2.28	3.01		1.03	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Protactinium 231	0.533	U	0.447	0.451		3.00	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Radium 226	1.34		0.234	0.272	1.00	0.195	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Thorium 232	1.34		0.233	0.270		0.187	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Thorium 234	1.48	U	1.86	1.87		2.62	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Uranium 235	0.254	U	0.344	0.345		0.578	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Americium 241	-0.0630	U	0.172	0.172		0.290	pCi/g	08/23/13 11:49	09/13/13 11:07	1
Protactinium 234m	-2.00	U	48.1	48.1		16.2	pCi/g	08/23/13 11:49	09/13/13 11:07	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

**Client Sample ID: L050265PES00**

**Lab Sample ID: 160-3435-28**

Date Collected: 08/16/13 15:00

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.46		0.217	0.259		0.214	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Bismuth 212	1.49		0.680	0.695		0.671	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Bismuth 214	1.43		0.177	0.225		0.127	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Lead 212	1.35		0.111	0.183		0.0974	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Lead 214	1.59		0.155	0.218		0.129	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Potassium 40	23.4		1.84	2.91		0.590	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Protactinium 231	0.697	U	0.396	0.402		1.73	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Radium 226	1.43		0.177	0.225	1.00	0.127	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Thorium 232	1.46		0.217	0.259		0.214	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Thorium 234	1.85		0.978	0.995		1.21	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Uranium 235	0.112	U	0.215	0.215		0.384	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Americium 241	0.00216	U	0.0853	0.0853		0.145	pCi/g	08/23/13 11:49	09/13/13 15:15	1
Protactinium 234m	1.62	U	2.75	2.76		9.19	pCi/g	08/23/13 11:49	09/13/13 15:15	1

**Client Sample ID: L050266PUB00**

**Lab Sample ID: 160-3435-29**

Date Collected: 08/16/13 11:50

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.985		0.166	0.194		0.125	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Bismuth 212	0.599		0.341	0.347		0.511	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Bismuth 214	1.15		0.116	0.166		0.0801	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Lead 212	1.09		0.0786	0.162		0.0697	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Lead 214	1.36		0.106	0.177		0.0946	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Potassium 40	23.2		1.32	2.72		0.391	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Protactinium 231	0.435	U	0.295	0.299		1.14	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Radium 226	1.15		0.116	0.166	1.00	0.0801	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Thorium 232	0.985		0.166	0.194		0.125	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Thorium 234	0.903		0.360	0.372		0.888	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Uranium 235	0.0606	U	0.132	0.133		0.276	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Americium 241	-0.0311	U	0.0685	0.0685		0.114	pCi/g	08/23/13 11:49	09/13/13 13:39	1
Protactinium 234m	0.707	U	3.38	3.38		6.01	pCi/g	08/23/13 11:49	09/13/13 13:39	1

**Client Sample ID: L050267PUB00**

**Lab Sample ID: 160-3435-30**

Date Collected: 08/16/13 11:55

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.13		0.175	0.206		0.154	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Bismuth 212	1.33		0.427	0.446		0.383	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Bismuth 214	1.45		0.130	0.192		0.0796	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Lead 212	1.23		0.0866	0.158		0.0760	pCi/g	08/23/13 11:49	09/13/13 15:16	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-3435-2

Client Sample ID: L050267PUB00

Lab Sample ID: 160-3435-30

Date Collected: 08/16/13 11:55

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Lead 214	1.65		0.135	0.209		0.0923	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Potassium 40	25.8		1.52	2.92		0.555	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Protactinium 231	0.650	U	0.285	0.293		1.45	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Radium 226	1.45		0.130	0.192	1.00	0.0796	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Thorium 232	1.13		0.175	0.206		0.154	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Thorium 234	1.99		0.831	0.854		0.999	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Uranium 235	0.157	U	0.140	0.141		0.292	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Americium 241	-0.0120	U	0.159	0.159		0.122	pCi/g	08/23/13 11:49	09/13/13 15:16	1
Protactinium 234m	6.26		3.75	3.80		3.84	pCi/g	08/23/13 11:49	09/13/13 15:16	1

Client Sample ID: L050268PUB00

Lab Sample ID: 160-3435-31

Date Collected: 08/16/13 12:00

Matrix: Solid

Date Received: 08/20/13 16:06

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.358		0.0662	0.0756		0.0555	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Bismuth 212	0.196	U	0.220	0.221		0.356	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Bismuth 214	0.619		0.0769	0.100		0.0403	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Lead 212	0.267		0.0437	0.0558		0.0511	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Lead 214	0.612		0.0679	0.0930		0.0572	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Potassium 40	5.03		0.639	0.821		0.242	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Protactinium 231	0.0893	U	0.132	0.132		0.801	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Radium 226	0.619		0.0769	0.100	1.00	0.0403	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Thorium 232	0.358		0.0662	0.0756		0.0555	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Thorium 234	0.745		0.529	0.535		0.668	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Uranium 235	0.165	U	0.115	0.117		0.194	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Americium 241	0.000	U	0.0384	0.0384		0.0801	pCi/g	08/23/13 11:49	09/13/13 13:42	1
Protactinium 234m	0.264	U	2.26	2.26		4.14	pCi/g	08/23/13 11:49	09/13/13 13:42	1

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-3435-2

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-68357/1-A

Matrix: Solid

Analysis Batch: 72609

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 68357

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01044	U	0.0305	0.0305		0.0581	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Bismuth 212	-0.01322	U	0.0808	0.0808		0.168	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Bismuth 214	-0.01691	U	0.676	0.676		0.0454	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Lead 212	0.002461	U	0.0131	0.0131		0.0267	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Lead 214	0.005852	U	0.0156	0.0156		0.0425	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Potassium 40	-0.08742	U	3.50	3.50		0.260	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Protactinium 231	0.06755	U	0.175	0.175		0.316	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Radium 226	-0.01691	U	0.676	0.676	1.00	0.0454	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Thorium 232	0.01044	U	0.0305	0.0305		0.0581	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Thorium 234	0.02297	U	0.0975	0.0976		0.272	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Uranium 235	0.02750	U	0.0475	0.0476		0.0805	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Americium 241	0.007593	U	0.0171	0.0171		0.0294	pCi/g	08/23/13 09:35	09/16/13 20:12	1
Protactinium 234m	0.0000	U	0.549	0.549		1.43	pCi/g	08/23/13 09:35	09/16/13 20:12	1

Lab Sample ID: LCS 160-68357/2-A

Matrix: Solid

Analysis Batch: 72490

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 68357

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	97.7	92.91		9.67		0.500	pCi/g	95	87 - 116
Cesium 137	31.6	31.00		3.24		0.116	pCi/g	98	87 - 120
Cobalt 60	24.6	23.72		2.39		0.0692	pCi/g	96	87 - 115

Lab Sample ID: 160-3435-1 DU

Matrix: Solid

Analysis Batch: 72492

Client Sample ID: L050190TUB00

Prep Type: Total/NA

Prep Batch: 68357

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	0.874		0.8873		0.205		0.143	pCi/g	0.04	1
Bismuth 212	1.57		0.9617		0.410		0.547	pCi/g	0.66	1
Bismuth 214	0.963		0.9340		0.155		0.0812	pCi/g	0.1	1
Lead 212	0.820		0.9323		0.143		0.0671	pCi/g	0.41	1
Lead 214	1.06		1.095		0.146		0.0804	pCi/g	0.14	1
Potassium 40	17.3		16.19		2.06		0.288	pCi/g	0.26	1
Protactinium 231	0.184	U	0.2798	U	0.271		1.07	pCi/g	0.22	1
Radium 226	0.963		0.9340		0.155	1.00	0.0812	pCi/g	0.1	1
Thorium 232	0.874		0.8873		0.205		0.143	pCi/g	0.04	1
Thorium 234	0.986		1.005		0.639		0.869	pCi/g	0.02	1
Uranium 235	0.0664	U	0.09492	U	0.0997		0.269	pCi/g	0.12	1
Americium 241	0.0736	U	-0.00851	U	1.07		0.103	pCi/g	0.07	1
Protactinium 234m	0.499	U	1.039	U	3.30		5.77	pCi/g	0.09	1

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-3435-2

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-68366/1-A

Matrix: Solid

Analysis Batch: 72483

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 68366

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.0000	U	0.0225	0.0225		0.0952	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Bismuth 212	0.0000	U	0.0352	0.0352		0.276	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Bismuth 214	-0.0002383	U	0.0221	0.0221		0.0430	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Lead 212	-0.005378	U	0.0634	0.0634		0.0291	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Lead 214	-0.004825	U	0.0783	0.0783		0.0357	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Potassium 40	0.0000	U	0.0473	0.0473		0.174	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Protactinium 231	-0.001682	U	0.240	0.240		0.453	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Radium 226	-0.0002383	U	0.0221	0.0221	1.00	0.0430	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Thorium 232	0.0000	U	0.0225	0.0225		0.0952	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Thorium 234	0.03965	U	0.184	0.184		0.302	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Uranium 235	0.02812	U	0.0368	0.0369		0.0605	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Americium 241	-0.004336	U	0.0134	0.0134		0.0238	pCi/g	08/23/13 11:49	09/13/13 12:44	1
Protactinium 234m	0.2159	U	0.835	0.835		1.76	pCi/g	08/23/13 11:49	09/13/13 12:44	1

Lab Sample ID: LCS 160-68366/2-A

Matrix: Solid

Analysis Batch: 72490

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 68366

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	97.7	94.07		9.79		0.480	pCi/g	96	87 - 116
Cesium 137	31.6	31.01		3.24		0.135	pCi/g	98	87 - 120
Cobalt 60	24.6	23.50		2.37		0.0590	pCi/g	95	87 - 115

Lab Sample ID: 160-3435-31 DU

Matrix: Solid

Analysis Batch: 72490

Client Sample ID: L050268PUB00

Prep Type: Total/NA

Prep Batch: 68366

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit
Actinium 228	0.358		0.3490		0.0698		0.0573	pCi/g	0.06	1
Bismuth 212	0.196	U	0.1733	U	0.160		0.250	pCi/g	0.06	1
Bismuth 214	0.619		0.5104		0.0855		0.0495	pCi/g	0.59	1
Lead 212	0.267		0.3105		0.0543		0.0361	pCi/g	0.39	1
Lead 214	0.612		0.5822		0.0813		0.0500	pCi/g	0.17	1
Potassium 40	5.03		5.101		0.740		0.234	pCi/g	0.04	1
Protactinium 231	0.0893	U	0.1458	U	0.144		0.560	pCi/g	0.20	1
Radium 226	0.619		0.5104		0.0855	1.00	0.0495	pCi/g	0.59	1
Thorium 232	0.358		0.3490		0.0698		0.0573	pCi/g	0.06	1
Thorium 234	0.745		0.7734		0.224		0.518	pCi/g	0.04	1
Uranium 235	0.165	U	0.1904		0.0880		0.123	pCi/g	0.12	1
Americium 241	0.000	U	0.01365	U	0.0370		0.0621	pCi/g	0.18	1
Protactinium 234m	0.264	U	2.015	U	1.59		3.22	pCi/g	0.45	1

TestAmerica St. Louis

# QC Association Summary

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

TestAmerica Job ID: 160-3435-2

## Rad

### Leach Batch: 67776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3435-1	L050190TUB00	Total/NA	Solid	Dry and Grind	
160-3435-1 DU	L050190TUB00	Total/NA	Solid	Dry and Grind	
160-3435-2	L050191TUB00	Total/NA	Solid	Dry and Grind	
160-3435-3	L050192TUB00	Total/NA	Solid	Dry and Grind	
160-3435-4	L050193TUB00	Total/NA	Solid	Dry and Grind	
160-3435-5	L050194TUB00	Total/NA	Solid	Dry and Grind	
160-3435-6	L050195TUB00	Total/NA	Solid	Dry and Grind	
160-3435-7	L050196TUB00	Total/NA	Solid	Dry and Grind	
160-3435-8	L050197TUB00	Total/NA	Solid	Dry and Grind	
160-3435-9	L050247PRS00	Total/NA	Solid	Dry and Grind	
160-3435-10	L050248PES00	Total/NA	Solid	Dry and Grind	
160-3435-11	L050249PRS00	Total/NA	Solid	Dry and Grind	
160-3435-12	L050250PES00	Total/NA	Solid	Dry and Grind	
160-3435-13	L050251PRS00	Total/NA	Solid	Dry and Grind	
160-3435-14	L050252PES00	Total/NA	Solid	Dry and Grind	
160-3435-15	L050253PES00	Total/NA	Solid	Dry and Grind	
160-3435-16	L050254PES00	Total/NA	Solid	Dry and Grind	
160-3435-17	L050255PES00	Total/NA	Solid	Dry and Grind	
160-3435-18	L050256PRS00	Total/NA	Solid	Dry and Grind	
160-3435-19	L050257PES00	Total/NA	Solid	Dry and Grind	
160-3435-20	L050258PES00	Total/NA	Solid	Dry and Grind	
160-3435-21	L050259PRQ00	Total/NA	Solid	Dry and Grind	
160-3435-22	L050259PRS00	Total/NA	Solid	Dry and Grind	
160-3435-23	L050260PES00	Total/NA	Solid	Dry and Grind	
160-3435-24	L050261PRS00	Total/NA	Solid	Dry and Grind	
160-3435-25	L050262PES00	Total/NA	Solid	Dry and Grind	
160-3435-26	L050263PES00	Total/NA	Solid	Dry and Grind	
160-3435-27	L050264PRS00	Total/NA	Solid	Dry and Grind	
160-3435-28	L050265PES00	Total/NA	Solid	Dry and Grind	
160-3435-29	L050266PUB00	Total/NA	Solid	Dry and Grind	
160-3435-30	L050267PUB00	Total/NA	Solid	Dry and Grind	
160-3435-31	L050268PUB00	Total/NA	Solid	Dry and Grind	
160-3435-31 DU	L050268PUB00	Total/NA	Solid	Dry and Grind	

### Prep Batch: 68357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3435-1	L050190TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-1 DU	L050190TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-2	L050191TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-3	L050192TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-4	L050193TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-5	L050194TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-6	L050195TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-7	L050196TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-8	L050197TUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-9	L050247PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-10	L050248PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-11	L050249PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-12	L050250PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-13	L050251PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-14	L050252PES00	Total/NA	Solid	Fill_Geo-21	67776

TestAmerica St. Louis

## QC Association Summary

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

TestAmerica Job ID: 160-3435-2

### Rad (Continued)

#### Prep Batch: 68357 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3435-15	L050253PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-16	L050254PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-17	L050255PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-18	L050256PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-19	L050257PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-20	L050258PES00	Total/NA	Solid	Fill_Geo-21	67776
LCS 160-68357/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-68357/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

#### Prep Batch: 68366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3435-21	L050259PRQ00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-22	L050259PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-23	L050260PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-24	L050261PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-25	L050262PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-26	L050263PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-27	L050264PRS00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-28	L050265PES00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-29	L050266PUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-30	L050267PUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-31	L050268PUB00	Total/NA	Solid	Fill_Geo-21	67776
160-3435-31 DU	L050268PUB00	Total/NA	Solid	Fill_Geo-21	67776
LCS 160-68366/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-68366/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	