

# 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: 160-16635-1

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

For:

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

Attn: Mr. Martin Swanson

*Rhonda Ridenhower*

Authorized for release by:

3/30/2016 9:59:57 AM

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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: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16635-1

**Job ID: 160-16635-1**

**Laboratory: TestAmerica St. Louis**

## Narrative

### CASE NARRATIVE

**Client: Westinghouse Electric Company LLC**

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

**Report Number: 160-16635-1**

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 03/23/2016; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 20.0 C.

### TECHNETIUM-99 (ICPMS)

Samples L08-09-01-T-R-S-00 (160-16635-1), L08-09-02-T-E-S-00 (160-16635-2), L08-09-03-T-E-S-00 (160-16635-3), L08-09-04-T-E-S-00 (160-16635-4), L08-09-05-T-E-S-00 (160-16635-5), L08-09-06-T-E-S-00 (160-16635-6), L08-09-07-T-E-S-00 (160-16635-7), L08-09-08-T-E-S-00 (160-16635-8), L08-09-08-T-E-Q-00 (160-16635-9) and L08-09-09-T-E-S-00 (160-16635-10) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 03/24/2016 and analyzed on 03/28/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### PERCENT SOLIDS

Samples L08-09-01-T-R-S-00 (160-16635-1), L08-09-02-T-E-S-00 (160-16635-2), L08-09-03-T-E-S-00 (160-16635-3),

## Case Narrative

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

TestAmerica Job ID: 160-16635-1

### Job ID: 160-16635-1 (Continued)

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

L08-09-04-T-E-S-00 (160-16635-4), L08-09-05-T-E-S-00 (160-16635-5), L08-09-06-T-E-S-00 (160-16635-6), L08-09-07-T-E-S-00 (160-16635-7), L08-09-08-T-E-S-00 (160-16635-8), L08-09-08-T-E-Q-00 (160-16635-9) and L08-09-09-T-E-S-00 (160-16635-10) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 03/24/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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

Samples L08-09-01-T-R-S-00 (160-16635-1), L08-09-02-T-E-S-00 (160-16635-2), L08-09-03-T-E-S-00 (160-16635-3), L08-09-04-T-E-S-00 (160-16635-4), L08-09-05-T-E-S-00 (160-16635-5), L08-09-06-T-E-S-00 (160-16635-6), L08-09-07-T-E-S-00 (160-16635-7), L08-09-08-T-E-S-00 (160-16635-8), L08-09-08-T-E-Q-00 (160-16635-9) and L08-09-09-T-E-S-00 (160-16635-10) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were dried on 03/23/2016, prepared on 03/25/2016 and analyzed on 03/27/2016.

#### Prep Batch 242189

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 21-days of 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. The samples are reported with the MDC achieved. L08-09-01-T-R-S-00 (160-16635-1), L08-09-02-T-E-S-00 (160-16635-2), L08-09-03-T-E-S-00 (160-16635-3), L08-09-04-T-E-S-00 (160-16635-4), (LCS 160-242189/2-A), (MB 160-242189/1-A), (160-16620-A-4-D) and (160-16620-A-4-E DU)

#### Prep Batch 242193

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 21-days of 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. The samples are reported with the MDC achieved. L08-09-05-T-E-S-00 (160-16635-5), L08-09-06-T-E-S-00 (160-16635-6), L08-09-07-T-E-S-00 (160-16635-7), L08-09-08-T-E-S-00 (160-16635-8), L08-09-08-T-E-Q-00 (160-16635-9), L08-09-09-T-E-S-00 (160-16635-10), (LCS 160-242193/2-A), (MB 160-242193/1-A) and (160-16635-A-5-E DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Hematite Decommissioning Project

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

Revision: 4

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-032216-01 Page 1/1				Requested Analysis										Laboratory Name:	
Project Name:				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Gamma Spec (21 day ingrow for Ra-226)						Total Containers	Laboratory Name:	
Westinghouse Electric Company														TA-MO	
Contact Person:														Laboratory Address:	
Clark Evers														13715 Rider Trail North	
Phone Number:														Phone No.	
314-810-3336				314-298-8566											
Sampler Name				Laboratory Contact Person:											
Kyle Weldon				Ivan Vania											
				Phone No.											
				708-870-8453											
				Turn Around Time											
				Rush (7 days)											
				Remarks											
Sample ID	Date	Time	Matrix												
L08-09-01-T-R-S-00	3/22/2016	14:35	S	C	X		X	X					1	LSA 08-09	
L08-09-02-T-E-S-00	3/22/2016	14:40	S	G	X		X	X					1	LSA 08-09	
L08-09-03-T-E-S-00	3/22/2016	14:45	S	G	X		X	X					1	LSA 08-09	
L08-09-04-T-E-S-00	3/22/2016	14:50	S	G	X		X	X					1	LSA 08-09	
L08-09-05-T-E-S-00	3/22/2016	14:55	S	G	X		X	X					1	LSA 08-09	
L08-09-06-T-E-S-00	3/22/2016	15:00	S	G	X		X	X					1	LSA 08-09	
L08-09-07-T-E-S-00	3/22/2016	15:05	S	G	X		X	X					1	LSA 08-09	
L08-09-08-T-E-S-00	3/22/2016	15:10	S	G	X		X	X					1	LSA 08-09	
L08-09-08-T-E-Q-00	3/22/2016	15:10	S	G	X		X	X					1	LSA 08-09	
L08-09-09-T-E-S-00	3/22/2016	15:15	S	G	X		X	X					1	LSA 08-09	
Relinquished by: <i>Gorski</i>				Date/Time: 3/23/16		Received by: <i>R. G. 3815</i>		Date/Time: 3/23/16		Total: 10		Cooler Temperature: Ambient			
Company Name: <i>WEC</i>				Date/Time: 9:15		Company Name: <i>CROSSROADS</i>		Date/Time: 9:15		Cooler ID: 0322-03		Shipper and Number:			
Received by:				Date/Time:		Relinquished by:		Date/Time:		Comments: N/A					
Company Name:				Date/Time:		Company Name:		Date/Time:							
Relinquished by: <i>R. G. 3815</i>				Date/Time: 3-23-16		Received by: <i>C. Decker</i>		Date/Time: 3-23-16		Verified By: <i>Gorski</i>					
Company Name: <i>CROSSROADS</i>				Date/Time: 11:00		Company Name: <i>TA St. Louis</i>		Date/Time: 11:00		Date: 3/23/16					



160-16635 Chain of Custody

## Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-16635-1

**Login Number: 16635**

**List Source: TestAmerica St. Louis**

**List Number: 1**

**Creator: Dedner, Connie L**

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.	N/A	
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 (excluding tests with immediate HTs)	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: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16635-1

### Qualifiers

#### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

### 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
CFL	Contains Free Liquid
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: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16635-1

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: HDP RFP-CBA-022 (7 DAY TAT)

TestAmerica Job ID: 160-16635-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-16635-1	L08-09-01-T-R-S-00	Solid	03/22/16 14:35	03/23/16 11:00
160-16635-2	L08-09-02-T-E-S-00	Solid	03/22/16 14:40	03/23/16 11:00
160-16635-3	L08-09-03-T-E-S-00	Solid	03/22/16 14:45	03/23/16 11:00
160-16635-4	L08-09-04-T-E-S-00	Solid	03/22/16 14:50	03/23/16 11:00
160-16635-5	L08-09-05-T-E-S-00	Solid	03/22/16 14:55	03/23/16 11:00
160-16635-6	L08-09-06-T-E-S-00	Solid	03/22/16 15:00	03/23/16 11:00
160-16635-7	L08-09-07-T-E-S-00	Solid	03/22/16 15:05	03/23/16 11:00
160-16635-8	L08-09-08-T-E-S-00	Solid	03/22/16 15:10	03/23/16 11:00
160-16635-9	L08-09-08-T-E-Q-00	Solid	03/22/16 15:10	03/23/16 11:00
160-16635-10	L08-09-09-T-E-S-00	Solid	03/22/16 15:15	03/23/16 11:00

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-01-T-R-S-00**

**Date Collected: 03/22/16 14:35**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-1**

**Matrix: Solid**

## 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	1.15		0.133	0.177		0.104	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Americium 241	-0.0140	U	0.0612	0.0612		0.102	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Bismuth 212	0.992		0.394	0.407		0.387	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Bismuth 214	0.845		0.0865	0.123		0.0591	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Lead 212	1.02		0.0722	0.150		0.0597	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Lead 214	0.955		0.0756	0.125		0.0558	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Potassium 40	17.0		0.968	1.99		0.245	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Protactinium 231	0.426	U	0.200	0.205		0.980	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Radium 226	0.845		0.0865	0.123	1.00	0.0591	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Thorium 234	1.30		0.465	0.484	1.00	0.724	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Uranium 235	0.111	U	0.131	0.132		0.221	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Protactinium 234m	2.56	U	2.65	2.66		4.34	pCi/g	03/25/16 10:27	03/27/16 18:25	1
Thorium 232	1.15		0.133	0.177		0.104	pCi/g	03/25/16 10:27	03/27/16 18:25	1
<b>Other Detected Radionuclides</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>
Ti-208	0.360		0.0456	0.0590		0.0320	pCi/g	03/25/16 10:27	03/27/16 18:25	1

**Client Sample ID: L08-09-01-T-R-S-00**

**Date Collected: 03/22/16 14:35**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-1**

**Matrix: Solid**

**Percent Solids: 83.3**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000096		0.000065	0.000019	mg/Kg	☼	03/24/16 08:53	03/28/16 14:32	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	1.64		0.0821	0.172	1.29	0.221	pCi/g	03/24/16 08:53	03/28/16 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	89		30 - 110					03/24/16 08:53	03/28/16 14:32	1

**Client Sample ID: L08-09-02-T-E-S-00**

**Date Collected: 03/22/16 14:40**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-2**

**Matrix: Solid**

## 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	1.10		0.160	0.195		0.146	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Americium 241	-0.0107	U	0.0585	0.0585		0.0984	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Bismuth 212	1.45		0.450	0.474		0.405	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Bismuth 214	0.894		0.0968	0.134		0.0623	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Lead 212	1.07		0.0774	0.158		0.0588	pCi/g	03/25/16 10:27	03/27/16 18:26	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

Client Sample ID: L08-09-02-T-E-S-00

Lab Sample ID: 160-16635-2

Date Collected: 03/22/16 14:40

Matrix: Solid

Date Received: 03/23/16 11:00

## 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
Lead 214	0.927		0.0986	0.138		0.0760	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Potassium 40	18.0		1.22	2.21		0.409	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Protactinium 231	0.650	U	0.309	0.317		1.02	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Radium 226	0.894		0.0968	0.134	1.00	0.0623	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Thorium 234	0.816	U	0.522	0.529	1.00	0.847	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Uranium 235	0.0894	U	0.127	0.128		0.231	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Protactinium 234m	4.27	U	3.12	3.15		5.43	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Thorium 232	1.10		0.160	0.195		0.146	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.68		0.600	0.632		0.758	pCi/g	03/25/16 10:27	03/27/16 18:26	1
Tl-208	0.354		0.0431	0.0566		0.0253	pCi/g	03/25/16 10:27	03/27/16 18:26	1

Client Sample ID: L08-09-02-T-E-S-00

Lab Sample ID: 160-16635-2

Date Collected: 03/22/16 14:40

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 81.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00039		0.000070	0.000021	mg/Kg	☼	03/24/16 08:53	03/28/16 14:36	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	6.63		0.141	0.626	1.40	0.240	pCi/g	03/24/16 08:53	03/28/16 14:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					03/24/16 08:53	03/28/16 14:36	1

Client Sample ID: L08-09-03-T-E-S-00

Lab Sample ID: 160-16635-3

Date Collected: 03/22/16 14:45

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	1.31		0.131	0.186		0.135	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Americium 241	-0.00852	U	21.8	21.8		0.101	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Bismuth 212	1.23		0.410	0.429		0.388	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Bismuth 214	0.944		0.0965	0.137		0.0685	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Lead 212	1.10		0.0749	0.161		0.0628	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Lead 214	1.10		0.0882	0.145		0.0626	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Potassium 40	21.8		1.11	2.46		0.253	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Protactinium 231	0.580	U	0.273	0.280		1.15	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Radium 226	0.944		0.0965	0.137	1.00	0.0685	pCi/g	03/25/16 10:27	03/27/16 18:27	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-03-T-E-S-00**

**Lab Sample ID: 160-16635-3**

Date Collected: 03/22/16 14:45

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	1.15		0.279	0.304	1.00	0.811	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Uranium 235	0.145	U	0.148	0.149		0.240	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Protactinium 234m	0.173	U	2.12	2.12		6.25	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Thorium 232	1.31		0.131	0.186		0.135	pCi/g	03/25/16 10:27	03/27/16 18:27	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.344		0.0495	0.0608		0.0397	pCi/g	03/25/16 10:27	03/27/16 18:27	1

**Client Sample ID: L08-09-03-T-E-S-00**

**Lab Sample ID: 160-16635-3**

Date Collected: 03/22/16 14:45

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 84.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00022		0.000068	0.000020	mg/Kg	☼	03/24/16 08:53	03/28/16 14:51	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	3.82		0.0496	0.355	1.35	0.232	pCi/g	03/24/16 08:53	03/28/16 14:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					03/24/16 08:53	03/28/16 14:51	1

**Client Sample ID: L08-09-04-T-E-S-00**

**Lab Sample ID: 160-16635-4**

Date Collected: 03/22/16 14:50

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	0.934		0.107	0.143		0.0944	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Americium 241	0.0115	U	0.0523	0.0524		0.0878	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Bismuth 212	1.04		0.362	0.378		0.343	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Bismuth 214	0.797		0.0847	0.118		0.0593	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Lead 212	0.975		0.0663	0.142		0.0516	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Lead 214	0.885		0.0699	0.116		0.0536	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Potassium 40	16.9		0.966	1.98		0.241	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Protactinium 231	0.539	U	0.233	0.241		0.837	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Radium 226	0.797		0.0847	0.118	1.00	0.0593	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Thorium 234	1.72		0.419	0.456	1.00	0.619	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Uranium 235	0.367		0.132	0.137		0.169	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Protactinium 234m	4.18	U	2.03	2.07		4.53	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Thorium 232	0.934		0.107	0.143		0.0944	pCi/g	03/25/16 10:27	03/27/16 21:18	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-04-T-E-S-00**

**Lab Sample ID: 160-16635-4**

**Date Collected: 03/22/16 14:50**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.26		0.413	0.439		0.578	pCi/g	03/25/16 10:27	03/27/16 21:18	1
Tl-208	0.298		0.0371	0.0483		0.0282	pCi/g	03/25/16 10:27	03/27/16 21:18	1

**Client Sample ID: L08-09-04-T-E-S-00**

**Lab Sample ID: 160-16635-4**

**Date Collected: 03/22/16 14:50**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

**Percent Solids: 85.6**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00050		0.000066	0.000020	mg/Kg	☼	03/24/16 08:53	03/28/16 14:55	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	8.52		0.529	0.945	1.32	0.225	pCi/g	03/24/16 08:53	03/28/16 14:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					03/24/16 08:53	03/28/16 14:55	1

**Client Sample ID: L08-09-05-T-E-S-00**

**Lab Sample ID: 160-16635-5**

**Date Collected: 03/22/16 14:55**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

**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	1.06		0.146	0.181		0.0970	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Americium 241	-0.00711	U	0.0593	0.0593		0.0996	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Bismuth 212	1.24		0.400	0.420		0.364	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Bismuth 214	0.846		0.0901	0.126		0.0617	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Lead 212	1.08		0.0672	0.156		0.0552	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Lead 214	0.996		0.0860	0.135		0.0625	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Potassium 40	18.0		1.05	2.12		0.329	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Protactinium 231	0.330	U	0.178	0.182		1.08	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Radium 226	0.846		0.0901	0.126	1.00	0.0617	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Thorium 234	1.35		0.481	0.501	1.00	0.747	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Uranium 235	0.0500	U	0.0708	0.0709		0.232	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Protactinium 234m	-1.35	U	4.13	4.14		4.32	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Thorium 232	1.06		0.146	0.181		0.0970	pCi/g	03/25/16 10:42	03/27/16 21:17	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.331		0.0414	0.0538		0.0303	pCi/g	03/25/16 10:42	03/27/16 21:17	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-05-T-E-S-00**

**Lab Sample ID: 160-16635-5**

Date Collected: 03/22/16 14:55

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 83.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000072		0.000066	0.000020	mg/Kg	☼	03/24/16 08:53	03/28/16 14:59	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	1.23		0.162	0.197	1.31	0.225	pCi/g	03/24/16 08:53	03/28/16 14:59	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	90		30 - 110	03/24/16 08:53	03/28/16 14:59	1

**Client Sample ID: L08-09-06-T-E-S-00**

**Lab Sample ID: 160-16635-6**

Date Collected: 03/22/16 15:00

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	1.03		0.142	0.177		0.150	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Americium 241	-0.00516	U	0.0463	0.0463		0.0783	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Bismuth 212	1.62		0.556	0.581		0.511	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Bismuth 214	0.961		0.0950	0.138		0.0583	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Lead 212	1.07		0.0803	0.160		0.0838	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Lead 214	1.06		0.0909	0.143		0.0829	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Potassium 40	17.8		1.15	2.16		0.304	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Protactinium 231	0.402	U	0.190	0.195		1.18	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Radium 226	0.961		0.0950	0.138	1.00	0.0583	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Thorium 234	0.700	U	0.293	0.302	1.00	0.847	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Uranium 235	0.0586	U	0.141	0.141		0.236	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Protactinium 234m	5.62		3.07	3.12		5.08	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Thorium 232	1.03		0.142	0.177		0.150	pCi/g	03/25/16 10:42	03/27/16 21:19	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.75		0.616	0.649		0.743	pCi/g	03/25/16 10:42	03/27/16 21:19	1
Tl-208	0.249		0.0506	0.0568		0.0664	pCi/g	03/25/16 10:42	03/27/16 21:19	1

**Client Sample ID: L08-09-06-T-E-S-00**

**Lab Sample ID: 160-16635-6**

Date Collected: 03/22/16 15:00

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 70.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000049	J	0.000083	0.000025	mg/Kg	☼	03/24/16 08:53	03/28/16 15:03	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-06-T-E-S-00**

**Date Collected: 03/22/16 15:00**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-6**

**Matrix: Solid**

**Percent Solids: 70.1**

**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	0.839		0.0718	0.105	1.66	0.285	pCi/g	03/24/16 08:53	03/28/16 15:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					03/24/16 08:53	03/28/16 15:03	1

**Client Sample ID: L08-09-07-T-E-S-00**

**Date Collected: 03/22/16 15:05**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-7**

**Matrix: Solid**

**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	1.28		0.115	0.172		0.0924	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Americium 241	-0.0112	U	0.397	0.397		0.0845	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Bismuth 212	1.62		0.527	0.553		0.439	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Bismuth 214	0.987		0.105	0.146		0.0740	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Lead 212	1.06		0.0811	0.160		0.0723	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Lead 214	1.00		0.0872	0.136		0.0717	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Potassium 40	21.2		1.11	2.40		0.259	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Protactinium 231	0.517	U	0.285	0.291		1.19	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Radium 226	0.987		0.105	0.146	1.00	0.0740	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Thorium 234	1.47		0.663	0.681	1.00	0.819	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Uranium 235	0.0906	U	0.137	0.138		0.247	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Protactinium 234m	5.81		2.86	2.92		4.97	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Thorium 232	1.28		0.115	0.172		0.0924	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.59		0.605	0.633		0.735	pCi/g	03/25/16 10:42	03/27/16 21:20	1
Tl-208	0.384		0.0443	0.0593		0.0321	pCi/g	03/25/16 10:42	03/27/16 21:20	1

**Client Sample ID: L08-09-07-T-E-S-00**

**Date Collected: 03/22/16 15:05**

**Date Received: 03/23/16 11:00**

**Lab Sample ID: 160-16635-7**

**Matrix: Solid**

**Percent Solids: 85.2**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00021		0.000068	0.000020	mg/Kg	☼	03/24/16 08:53	03/28/16 15:07	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	3.68		0.130	0.362	1.35	0.232	pCi/g	03/24/16 08:53	03/28/16 15:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					03/24/16 08:53	03/28/16 15:07	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

Client Sample ID: L08-09-08-T-E-S-00

Lab Sample ID: 160-16635-8

Date Collected: 03/22/16 15:10

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	0.898		0.124	0.154		0.0915	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Americium 241	-0.0104	U	0.0593	0.0593		0.0995	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Bismuth 212	1.49		0.391	0.421		0.316	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Bismuth 214	0.787		0.0971	0.127		0.0731	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Lead 212	1.00		0.0731	0.149		0.0589	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Lead 214	0.991		0.0817	0.131		0.0753	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Potassium 40	17.0		1.02	2.02		0.273	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Protactinium 231	0.472	U	0.194	0.200		0.992	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Radium 226	0.787		0.0971	0.127	1.00	0.0731	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Thorium 234	1.40		0.299	0.333	1.00	0.786	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Uranium 235	0.694		0.184	0.197		0.214	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Protactinium 234m	2.60	U	1.90	1.92		4.27	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Thorium 232	0.898		0.124	0.154		0.0915	pCi/g	03/25/16 10:42	03/27/16 21:51	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
TI-208	0.317		0.0413	0.0528		0.0321	pCi/g	03/25/16 10:42	03/27/16 21:51	1

Client Sample ID: L08-09-08-T-E-S-00

Lab Sample ID: 160-16635-8

Date Collected: 03/22/16 15:10

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 88.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.0011		0.000064	0.000019	mg/Kg	☼	03/24/16 08:53	03/28/16 15:10	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	19.6		0.394	1.84	1.28	0.218	pCi/g	03/24/16 08:53	03/28/16 15:10	1
Carrier	%Yield	Qualifier	Limits							
Re	87		30 - 110							

Client Sample ID: L08-09-08-T-E-Q-00

Lab Sample ID: 160-16635-9

Date Collected: 03/22/16 15:10

Matrix: Solid

Date Received: 03/23/16 11:00

## 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	0.932		0.112	0.147		0.0821	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Americium 241	-0.0130	U	0.0623	0.0623		0.104	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Bismuth 212	1.18		0.367	0.387		0.316	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Bismuth 214	0.805		0.0807	0.116		0.0554	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Lead 212	0.963		0.0697	0.143		0.0571	pCi/g	03/25/16 10:42	03/27/16 21:49	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-08-T-E-Q-00**

**Lab Sample ID: 160-16635-9**

**Date Collected: 03/22/16 15:10**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

## 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
Lead 214	0.996		0.0773	0.129		0.0594	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Potassium 40	17.1		0.981	2.01		0.290	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Protactinium 231	0.350	U	0.175	0.179		0.945	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Radium 226	0.805		0.0807	0.116	1.00	0.0554	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Thorium 234	1.89		0.510	0.547	1.00	0.774	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Uranium 235	0.595		0.138	0.151		0.172	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Protactinium 234m	0.818	U	2.45	2.46		4.29	pCi/g	03/25/16 10:42	03/27/16 21:49	1
Thorium 232	0.932		0.112	0.147		0.0821	pCi/g	03/25/16 10:42	03/27/16 21:49	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.282		0.0397	0.0493		0.0317	pCi/g	03/25/16 10:42	03/27/16 21:49	1

**Client Sample ID: L08-09-08-T-E-Q-00**

**Lab Sample ID: 160-16635-9**

**Date Collected: 03/22/16 15:10**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

**Percent Solids: 85.0**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.0013		0.000067	0.000020	mg/Kg	☼	03/24/16 08:53	03/28/16 15:14	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	21.8		0.423	2.05	1.35	0.231	pCi/g	03/24/16 08:53	03/28/16 15:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					03/24/16 08:53	03/28/16 15:14	1

**Client Sample ID: L08-09-09-T-E-S-00**

**Lab Sample ID: 160-16635-10**

**Date Collected: 03/22/16 15:15**

**Matrix: Solid**

**Date Received: 03/23/16 11:00**

## 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	1.31		0.159	0.207		0.0977	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Americium 241	-0.00908	U	0.648	0.648		0.0806	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Bismuth 212	1.67		0.461	0.492		0.385	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Bismuth 214	0.996		0.113	0.153		0.0791	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Lead 212	1.14		0.0829	0.169		0.0683	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Lead 214	1.15		0.0990	0.155		0.0766	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Potassium 40	21.1		1.24	2.46		0.389	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Protactinium 231	0.197	U	0.531	0.531		0.901	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Radium 226	0.996		0.113	0.153	1.00	0.0791	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Thorium 234	0.930		0.310	0.325	1.00	0.906	pCi/g	03/25/16 10:42	03/27/16 21:52	1

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# Client Sample Results

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

TestAmerica Job ID: 160-16635-1

**Client Sample ID: L08-09-09-T-E-S-00**

**Lab Sample ID: 160-16635-10**

Date Collected: 03/22/16 15:15

Matrix: Solid

Date Received: 03/23/16 11:00

## 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
Uranium 235	0.0908	U	0.146	0.147		0.245	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Protactinium 234m	6.38		3.14	3.21		4.25	pCi/g	03/25/16 10:42	03/27/16 21:52	1
Thorium 232	1.31		0.159	0.207		0.0977	pCi/g	03/25/16 10:42	03/27/16 21:52	1
<b>Other Detected</b>										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.375		0.0469	0.0607		0.0337	pCi/g	03/25/16 10:42	03/27/16 21:52	1

**Client Sample ID: L08-09-09-T-E-S-00**

**Lab Sample ID: 160-16635-10**

Date Collected: 03/22/16 15:15

Matrix: Solid

Date Received: 03/23/16 11:00

Percent Solids: 80.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00045		0.000072	0.000022	mg/Kg	☼	03/24/16 08:53	03/28/16 15:18	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	7.78		0.406	0.823	1.45	0.248	pCi/g	03/24/16 08:53	03/28/16 15:18	1
<b>Carrier</b>										
Re	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	87		30 - 110					03/24/16 08:53	03/28/16 15:18	1

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# QC Sample Results

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

TestAmerica Job ID: 160-16635-1

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

Lab Sample ID: MB 160-241900/1-A  
Matrix: Solid  
Analysis Batch: 242490

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000053	0.000016	mg/Kg		03/24/16 08:53	03/28/16 13:34	1

Lab Sample ID: LCS 160-241900/2-A  
Matrix: Solid  
Analysis Batch: 242490

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00119	0.00122		mg/Kg		103	80 - 120

Lab Sample ID: 160-16634-A-1-D MS  
Matrix: Solid  
Analysis Batch: 242490

Client Sample ID: Matrix Spike  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00166	0.00172		mg/Kg	✱	103	75 - 125

Lab Sample ID: 160-16634-A-1-E MSD  
Matrix: Solid  
Analysis Batch: 242490

Client Sample ID: Matrix Spike Duplicate  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00158	0.00166		mg/Kg	✱	105	75 - 125	3	30

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

Lab Sample ID: MB 160-241900/1-A  
Matrix: Solid  
Analysis Batch: 242491

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.001640	U	0.0423	0.0423	1.06	0.182	pCi/g	03/24/16 08:53	03/28/16 13:34	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	94		30 - 110					03/24/16 08:53	03/28/16 13:34	1

Lab Sample ID: LCS 160-241900/2-A  
Matrix: Solid  
Analysis Batch: 242491

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 241900

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	20.4	20.95		2.03	1.06	0.181	pCi/g	103	80 - 120
Carrier	LCS %Yield	LCS Qualifier	Limits						
Re	94		30 - 110						

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# QC Sample Results

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

TestAmerica Job ID: 160-16635-1

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

Lab Sample ID: 160-16634-A-1-D MS

Matrix: Solid

Analysis Batch: 242491

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 241900

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.381		28.4	29.37		2.90	1.63	0.279	pCi/g	102	75 - 125
Carrier	MS %Yield	MS Qualifier	Limits								
Re	86		30 - 110								

Lab Sample ID: 160-16634-A-1-E MSD

Matrix: Solid

Analysis Batch: 242491

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 241900

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	0.381		27.1	28.45		2.65	1.56	0.267	pCi/g	103	75 - 125	0.17	1
Carrier	MSD %Yield	MSD Qualifier	Limits										
Re	85		30 - 110										

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

Lab Sample ID: MB 160-242189/1-A

Matrix: Solid

Analysis Batch: 242403

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 242189

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.001988	U	0.0115	0.0115		0.0952	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Americium 241	-0.0006256	U	0.0125	0.0125		0.0233	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Bismuth 212	0.0000	U	0.0352	0.0352		0.276	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Bismuth 214	0.001855	U	0.0207	0.0207		0.0443	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Lead 212	0.003391	U	0.0140	0.0140		0.0278	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Lead 214	-0.007417	U	0.160	0.160		0.0393	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Potassium 40	-0.06207	U	2.48	2.48		0.243	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Protactinium 231	0.02519	U	0.120	0.120		0.424	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Radium 226	0.001855	U	0.0207	0.0207	1.00	0.0443	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Thorium 234	0.03156	U	0.137	0.137	1.00	0.280	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Uranium 235	0.01167	U	0.0125	0.0125		0.0698	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Protactinium 234m	-0.3801	U	15.2	15.2		1.90	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Thorium 232	0.001988	U	0.0115	0.0115		0.0952	pCi/g	03/25/16 10:27	03/27/16 15:14	1
Other Detected Radionuclides	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Other Detected Radionuclide	None						pCi/g	03/25/16 10:27	03/27/16 15:14	1

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# QC Sample Results

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

TestAmerica Job ID: 160-16635-1

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

Lab Sample ID: LCS 160-242189/2-A

Matrix: Solid

Analysis Batch: 242396

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 242189

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	101	104.1		10.9		0.511	pCi/g	103	87 - 116
Cesium 137	34.1	37.59		3.89	0.200	0.155	pCi/g	110	87 - 120
Cobalt 60	31.8	34.45		3.41		0.101	pCi/g	108	87 - 115

Lab Sample ID: 160-16620-A-4-E DU

Matrix: Solid

Analysis Batch: 242394

Client Sample ID: Duplicate

Prep Type: Total/NA

Prep Batch: 242189

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	0.629		0.6326		0.115		0.0854	pCi/g	0.01	1
Americium 241	0.0140	U	0.01144	U	0.0373		0.0627	pCi/g	0.03	1
Bismuth 212	0.683		0.6091		0.248		0.230	pCi/g	0.15	1
Bismuth 214	0.461		0.5373		0.0895		0.0501	pCi/g	0.45	1
Lead 212	0.480		0.4979		0.0827		0.0479	pCi/g	0.11	1
Lead 214	0.592		0.6521		0.0914		0.0517	pCi/g	0.34	1
Potassium 40	13.3		12.67		1.55		0.183	pCi/g	0.19	1
Protactinium 231	0.218	U	0.2292	U	0.170		0.746	pCi/g	0.04	1
Radium 226	0.461		0.5373		0.0895	1.00	0.0501	pCi/g	0.45	1
Thorium 234	0.687		0.5604		0.343	1.00	0.547	pCi/g	0.20	1
Uranium 235	0.0654	U	0.1222	U	0.114		0.148	pCi/g	0.28	1
Protactinium 234m	-0.488	U	2.994	U	1.50		4.33	pCi/g	0.45	1
Thorium 232	0.629		0.6326		0.115		0.0854	pCi/g	0.01	1
Other Detected Radionuclides	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Pb-210	1.29		0.6953		0.427		0.552	pCi/g	0.68	1
Tl-208	0.182		0.1964		0.0408		0.0280	pCi/g	0.20	1

Lab Sample ID: MB 160-242193/1-A

Matrix: Solid

Analysis Batch: 242403

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 242193

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01189	U	0.0350	0.0350		0.0727	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Americium 241	-0.002021	U	0.0131	0.0131		0.0239	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Bismuth 212	0.07196	U	0.168	0.168		0.298	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Bismuth 214	0.008331	U	0.0138	0.0139		0.0577	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Lead 212	0.004119	U	0.0124	0.0124		0.0251	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Lead 214	-0.01165	U	0.132	0.132		0.0359	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Potassium 40	-0.004057	U	0.120	0.120		0.281	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Protactinium 231	0.007493	U	0.156	0.156		0.312	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Radium 226	0.008331	U	0.0138	0.0139	1.00	0.0577	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Thorium 234	-0.007078	U	0.116	0.116	1.00	0.247	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Uranium 235	-0.004101	U	0.0561	0.0561		0.0628	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Protactinium 234m	-0.05790	U	1.86	1.86		3.05	pCi/g	03/25/16 10:42	03/27/16 18:43	1

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-16635-1

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

Lab Sample ID: MB 160-242193/1-A

Matrix: Solid

Analysis Batch: 242403

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 242193

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 232	0.01189	U	0.0350	0.0350		0.0727	pCi/g	03/25/16 10:42	03/27/16 18:43	1
Other Detected Radionuclides	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Other Detected Radionuclide	None						pCi/g	03/25/16 10:42	03/27/16 18:43	1

Lab Sample ID: LCS 160-242193/2-A

Matrix: Solid

Analysis Batch: 242403

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 242193

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	101	105.9		11.0		0.606	pCi/g	105	87 - 116
Cesium 137	34.1	35.04		3.68	0.200	0.223	pCi/g	103	87 - 120
Cobalt 60	31.8	32.30		3.27		0.138	pCi/g	102	87 - 115

Lab Sample ID: 160-16635-5 DU

Matrix: Solid

Analysis Batch: 242394

Client Sample ID: L08-09-05-T-E-S-00

Prep Type: Total/NA

Prep Batch: 242193

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.06		1.014		0.158		0.0916	pCi/g	0.13	1
Americium 241	-0.00711	U	0.002243	U	0.0557		0.0943	pCi/g	0.08	1
Bismuth 212	1.24		1.376		0.413		0.338	pCi/g	0.16	1
Bismuth 214	0.846		0.7624		0.124		0.0678	pCi/g	0.33	1
Lead 212	1.08		1.079		0.160		0.0605	pCi/g	0.02	1
Lead 214	0.996		0.9098		0.132		0.0718	pCi/g	0.32	1
Potassium 40	18.0		18.15		2.21		0.342	pCi/g	0.04	1
Protactinium 231	0.330	U	0.5307	U	0.276		1.08	pCi/g	0.44	1
Radium 226	0.846		0.7624		0.124	1.00	0.0678	pCi/g	0.33	1
Thorium 234	1.35		0.8122	U	0.309	1.00	0.849	pCi/g	0.67	1
Uranium 235	0.0500	U	0.04279	U	0.144		0.238	pCi/g	0.03	1
Protactinium 234m	-1.35	U	1.344	U	2.94		5.30	pCi/g	0.38	1
Thorium 232	1.06		1.014		0.158		0.0916	pCi/g	0.13	1
Other Detected Radionuclides	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Tl-208	0.331		0.3463		0.0563		0.0245	pCi/g	0.14	1

TestAmerica St. Louis

# QC Association Summary

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

TestAmerica Job ID: 160-16635-1

## Metals

### Prep Batch: 241900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16634-A-1-D MS	Matrix Spike	Total/NA	Solid	None	
160-16634-A-1-E MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	None	
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	None	
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	None	
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	None	
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	None	
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	None	
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	None	
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	None	
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	None	
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	None	
LCS 160-241900/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-241900/1-A	Method Blank	Total/NA	Solid	None	

### Analysis Batch: 242490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16634-A-1-D MS	Matrix Spike	Total/NA	Solid	6020A	241900
160-16634-A-1-E MSD	Matrix Spike Duplicate	Total/NA	Solid	6020A	241900
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	6020A	241900
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	6020A	241900
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	6020A	241900
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	6020A	241900
LCS 160-241900/2-A	Lab Control Sample	Total/NA	Solid	6020A	241900
MB 160-241900/1-A	Method Blank	Total/NA	Solid	6020A	241900

## General Chemistry

### Analysis Batch: 241878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16634-A-1 DU	Duplicate	Total/NA	Solid	Moisture	
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	Moisture	
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	Moisture	
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	Moisture	
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	Moisture	

TestAmerica St. Louis



# QC Association Summary

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

TestAmerica Job ID: 160-16635-1

## Rad

### Leach Batch: 241585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16620-A-4-E DU	Duplicate	Total/NA	Solid	Dry and Grind	

### Leach Batch: 241804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-5 DU	L08-09-05-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	Dry and Grind	
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	Dry and Grind	

### Prep Batch: 241900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16634-A-1-D MS	Matrix Spike	Total/NA	Solid	None	
160-16634-A-1-E MSD	Matrix Spike Duplicate	Total/NA	Solid	None	
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	None	
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	None	
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	None	
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	None	
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	None	
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	None	
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	None	
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	None	
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	None	
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	None	
LCS 160-241900/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-241900/1-A	Method Blank	Total/NA	Solid	None	

### Prep Batch: 242189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16620-A-4-E DU	Duplicate	Total/NA	Solid	Fill_Geo-0	241585
160-16635-1	L08-09-01-T-R-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-2	L08-09-02-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-3	L08-09-03-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-4	L08-09-04-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
LCS 160-242189/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-242189/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

### Prep Batch: 242193

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16635-5	L08-09-05-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-5 DU	L08-09-05-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-6	L08-09-06-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-7	L08-09-07-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-8	L08-09-08-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
160-16635-9	L08-09-08-T-E-Q-00	Total/NA	Solid	Fill_Geo-0	241804

TestAmerica St. Louis



## QC Association Summary

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

TestAmerica Job ID: 160-16635-1

### Rad (Continued)

#### Prep Batch: 242193 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16635-10	L08-09-09-T-E-S-00	Total/NA	Solid	Fill_Geo-0	241804
LCS 160-242193/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-242193/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

## Tracer/Carrier Summary

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

TestAmerica Job ID: 160-16635-1

**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)
160-16634-A-1-D MS	Matrix Spike	86
160-16634-A-1-E MSD	Matrix Spike Duplicate	85
160-16635-1	L08-09-01-T-R-S-00	89
160-16635-2	L08-09-02-T-E-S-00	88
160-16635-3	L08-09-03-T-E-S-00	88
160-16635-4	L08-09-04-T-E-S-00	87
160-16635-5	L08-09-05-T-E-S-00	90
160-16635-6	L08-09-06-T-E-S-00	87
160-16635-7	L08-09-07-T-E-S-00	87
160-16635-8	L08-09-08-T-E-S-00	87
160-16635-9	L08-09-08-T-E-Q-00	87
160-16635-10	L08-09-09-T-E-S-00	87
LCS 160-241900/2-A	Lab Control Sample	94
MB 160-241900/1-A	Method Blank	94

### Tracer/Carrier Legend

Re = Re