

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: 160-3127-1

Client Project/Site: RFP-CBA-022 (21 DAY TAT)

For:

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

Attn: Martin Swanson



Authorized for release by:
8/22/2013 11:02:44 AM

Ivan Vania, Project Manager I
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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 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Job ID: 160-3127-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

Project: RFP-CBA-022 (21 DAY TAT)

Report Number: 160-3127-1

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 07/25/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 20.0 C.

TECHNETIUM-99 (ICPMS)

Samples L050238PUI01 (160-3127-1), L050238PUI02 (160-3127-2), L050238PUI03 (160-3127-3), L050238PUI04 (160-3127-4), L050238PUI05 (160-3127-5) and L050238PUI06 (160-3127-6) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 07/30/2013 and analyzed on 08/02/2013.

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

PERCENT SOLIDS

Samples L050238PUI01 (160-3127-1), L050238PUI02 (160-3127-2), L050238PUI03 (160-3127-3), L050238PUI04 (160-3127-4), L050238PUI05 (160-3127-5) and L050238PUI06 (160-3127-6) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 07/26/2013.

Case Narrative

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Job ID: 160-3127-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples L050238PUI01 (160-3127-1), L050238PUI02 (160-3127-2), L050238PUI03 (160-3127-3), L050238PUI04 (160-3127-4), L050238PUI05 (160-3127-5) and L050238PUI06 (160-3127-6) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were leached on 07/26/2013, prepared on 07/30/2013 and analyzed on 08/20/2013.

Preparation Batch 63754:

The normal tuna can geometry for Radium-226 by gamma spec was not used which could potentially bias the results low due to the loss of Radon into the headspace of the container. The samples were prepared in the client requested marn soil geometry.

No other difficulties were encountered during the Radium 226 analysis. All other quality control parameters were within the acceptance limits.

Hematite Decommissioning Project		Procedure HDP-PR-QA-006, (Chain of Custody)										Page 1 of 1									
		Revision: 3																			
Westinghouse Non-Proprietary Class 3																					
FORM HDP-PR-QA-006-1 CHAIN OF CUSTODY																					
Instructions: Each time the container is transferred to another organization, a person from each organization should sign the CoC. The Laboratory/End User must verify that the sample is correctly identified before the sample is released for use or analysis and send the completed CoC to HDP.																					
Chain of Custody ID No.		F-072413-01		Page		1/1		Requested Analysis						Laboratory Name: TA-MO Laboratory Address: 13715 Rider Trail North Phone No. 314-298-8566 Laboratory Contact Person: Joe Walker Phone No. 708-870-8453 Turn Around Time Rush (7 days) Remarks							
Project Name: Westinghouse Electric Company Contact Person: Gerald Rood Phone Number: 314-810-3382 Sampler Name Scott Jenkins								<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Comp (C) or Grab (G)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Gamma Spec</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Isotopic Uranium</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Tc-99</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Gamma Spec (21 day ingrow for Ra-226)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"></div> </div>													
																Sample ID	Date	Time	Matrix		
L050238PUI01	7/2/2013	16:42	S	G			X	X					1								
L050238PUI02	7/2/2013	16:52	S	G			X	X					1								
L050238PUI03	7/2/2013	16:58	S	G			X	X					1								
L050238PUI04	7/2/2013	16:33	S	G			X	X					1								
L050238PUI05	7/2/2013	16:15	S	G			X	X					1								
L050238PUI06	7/2/2013	16:24	S	G			X	X					1								
Relinquished by:		Date/Time		Received by:		Date/Time		Total		Cooler Temperature:											
[Signature]		7-25-13 1500		[Signature]		7-25-13 1500		6		Ambient											
Company Name:				Company Name:				Cooler ID:		Shipper and Number:											
WEC				Westinghouse				0724-02													
Received by:		Date/Time		Relinquished by:		Date/Time		Verified By: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border-bottom: 1px solid black; width: 150px;"></div> <div style="border-bottom: 1px solid black; width: 150px;"></div> </div>													
Company Name:				Company Name:																	
Relinquished by:		Date/Time		Received by:		Date/Time															
Company Name:				Company Name:																	

3127

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3127-1

Login Number: 3127

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 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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	Indicates the analyte was analyzed for but not detected.

Glossary

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

Method Summary

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL

Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

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

Laboratory References:

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

Sample Summary

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3127-1	L050238PUI01	Solid	07/02/13 16:42	07/25/13 15:00
160-3127-2	L050238PUI02	Solid	07/02/13 16:52	07/25/13 15:00
160-3127-3	L050238PUI03	Solid	07/02/13 16:58	07/25/13 15:00
160-3127-4	L050238PUI04	Solid	07/02/13 16:33	07/25/13 15:00
160-3127-5	L050238PUI05	Solid	07/02/13 16:15	07/25/13 15:00
160-3127-6	L050238PUI06	Solid	07/02/13 16:24	07/25/13 15:00

Client Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Client Sample ID: L050238PUI01

Lab Sample ID: 160-3127-1

Date Collected: 07/02/13 16:42

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 82.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00085	0.000026	mg/Kg	☆	07/30/13 13:32	08/02/13 19:59	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	0.0667	U	0.102	0.144	1.71	0.293	pCi/g	07/30/13 13:32	08/02/13 19:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	71		30 - 110					07/30/13 13:32	08/02/13 19:59	1

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	0.808		0.113	0.140		0.0677	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Bismuth 212	0.977		0.372	0.386		0.326	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Bismuth 214	0.822		0.0938	0.127		0.0643	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Lead 212	0.745		0.0611	0.114		0.0523	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Lead 214	0.890		0.0720	0.117		0.0667	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Potassium 40	14.4		0.984	1.77		0.295	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Protactinium 231	0.513	U	0.333	0.337		0.997	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Radium 226	0.822		0.0938	0.127	1.00	0.0643	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Thorium 232	0.808		0.113	0.140		0.0677	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Thorium 234	2.92		0.776	0.834		0.899	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Uranium 235	0.855		0.151	0.174		0.186	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Americium 241	0.0383	U	0.0610	0.0611		0.101	pCi/g	07/30/13 13:06	08/20/13 04:08	1
Protactinium 234m	4.18	U	2.49	2.52		4.24	pCi/g	07/30/13 13:06	08/20/13 04:08	1

Client Sample ID: L050238PUI02

Lab Sample ID: 160-3127-2

Date Collected: 07/02/13 16:52

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 91.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000025	J	0.00073	0.000022	mg/Kg	☆	07/30/13 13:32	08/02/13 20:13	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	0.429		0.192	0.261	1.46	0.250	pCi/g	07/30/13 13:32	08/02/13 20:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	75		30 - 110					07/30/13 13:32	08/02/13 20:13	1

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	0.647		0.107	0.126		0.0723	pCi/g	07/30/13 13:06	08/20/13 04:09	1

TestAmerica St. Louis

Client Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Client Sample ID: L050238PUI02

Lab Sample ID: 160-3127-2

Date Collected: 07/02/13 16:52

Matrix: Solid

Date Received: 07/25/13 15:00

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+/-)						
Bismuth 212	0.680		0.267	0.277		0.250	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Bismuth 214	0.683		0.0859	0.111		0.0577	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 212	0.473		0.0577	0.0841		0.0676	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 214	0.816		0.0848	0.120		0.0735	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Potassium 40	9.63		0.823	1.28		0.300	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 231	0.111	U	0.188	0.188		1.04	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Radium 226	0.683		0.0859	0.111	1.00	0.0577	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 232	0.647		0.107	0.126		0.0723	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 234	16.5		0.894	1.94		1.48	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Uranium 235	3.35		0.267	0.433		0.308	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Americium 241	-0.0204	U	0.0970	0.0970		0.162	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 234m	20.5		4.60	5.05		3.52	pCi/g	07/30/13 13:06	08/20/13 04:09	1

Client Sample ID: L050238PUI03

Lab Sample ID: 160-3127-3

Date Collected: 07/02/13 16:58

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 82.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00071	0.000021	mg/Kg	☆	07/30/13 13:32	08/02/13 20:18	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Technetium 99	0.342		0.0461	0.0659	1.42	0.243	pCi/g	07/30/13 13:32	08/02/13 20:18	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	85		30 - 110					07/30/13 13:32	08/02/13 20:18	1

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	0.535		0.113	0.125		0.0985	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Bismuth 212	1.03		0.279	0.299		0.178	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Bismuth 214	0.661		0.0848	0.109		0.0550	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 212	0.491		0.0532	0.0829		0.0516	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 214	0.776		0.0883	0.120		0.0652	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Potassium 40	9.28		0.846	1.27		0.142	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 231	0.307	U	0.237	0.240		1.06	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Radium 226	0.661		0.0848	0.109	1.00	0.0550	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 232	0.535		0.113	0.125		0.0985	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 234	11.5		0.626	1.35		1.03	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Uranium 235	3.04		0.254	0.400		0.278	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Americium 241	-0.0341	U	0.107	0.107		0.126	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 234m	17.1		4.32	4.65		2.90	pCi/g	07/30/13 13:06	08/20/13 04:09	1

TestAmerica St. Louis

Client Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Client Sample ID: L050238PUI04

Lab Sample ID: 160-3127-4

Date Collected: 07/02/13 16:33

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 85.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00072	0.000022	mg/Kg	☆	07/30/13 13:32	08/02/13 20:23	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	-0.00419	U	-0.0840	0.104	1.44	0.247	pCi/g	07/30/13 13:32	08/02/13 20:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	81		30 - 110					07/30/13 13:32	08/02/13 20:23	1

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	0.975		0.128	0.162		0.0767	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Bismuth 212	1.27		0.385	0.407		0.294	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Bismuth 214	0.911		0.119	0.152		0.0835	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Lead 212	0.961		0.0805	0.148		0.0695	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Lead 214	0.996		0.0969	0.142		0.0807	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Potassium 40	14.2		1.23	1.90		0.325	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Protactinium 231	0.315	U	0.217	0.220		1.43	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Radium 226	0.911		0.119	0.152	1.00	0.0835	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Thorium 232	0.975		0.128	0.162		0.0767	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Thorium 234	1.28		0.540	0.556		0.845	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Uranium 235	0.112	U	0.185	0.185		0.267	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Americium 241	0.0278	U	0.0668	0.0668		0.112	pCi/g	07/30/13 13:06	08/20/13 04:10	1
Protactinium 234m	-0.0388	U	3.36	3.36		6.15	pCi/g	07/30/13 13:06	08/20/13 04:10	1

Client Sample ID: L050238PUI05

Lab Sample ID: 160-3127-5

Date Collected: 07/02/13 16:15

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 87.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00068	0.000021	mg/Kg	☆	07/30/13 13:32	08/02/13 20:28	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	0.206	U	0.0324	0.0451	1.37	0.234	pCi/g	07/30/13 13:32	08/02/13 20:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	83		30 - 110					07/30/13 13:32	08/02/13 20:28	1

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	0.324		0.0616	0.0699		0.0706	pCi/g	07/30/13 13:06	08/20/13 04:09	1

TestAmerica St. Louis

Client Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Client Sample ID: L050238PUI05

Lab Sample ID: 160-3127-5

Date Collected: 07/02/13 16:15

Matrix: Solid

Date Received: 07/25/13 15:00

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+/-)						
Bismuth 212	0.373		0.171	0.175		0.226	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Bismuth 214	0.488		0.0587	0.0776		0.0364	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 212	0.308		0.0356	0.0534		0.0349	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Lead 214	0.521		0.0536	0.0762		0.0449	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Potassium 40	5.67		0.537	0.791		0.178	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 231	0.223	U	0.153	0.155		0.503	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Radium 226	0.488		0.0587	0.0776	1.00	0.0364	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 232	0.324		0.0616	0.0699		0.0706	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Thorium 234	1.38		0.428	0.452		0.535	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Uranium 235	0.317		0.100	0.105		0.113	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Americium 241	0.00576	U	0.0371	0.0371		0.0627	pCi/g	07/30/13 13:06	08/20/13 04:09	1
Protactinium 234m	0.325	U	1.21	1.21		3.38	pCi/g	07/30/13 13:06	08/20/13 04:09	1

Client Sample ID: L050238PUI06

Lab Sample ID: 160-3127-6

Date Collected: 07/02/13 16:24

Matrix: Solid

Date Received: 07/25/13 15:00

Percent Solids: 84.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000062	J	0.00076	0.000023	mg/Kg	☆	07/30/13 13:32	08/02/13 20:33	1

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Technetium 99	1.06		0.0862	0.166	1.52	0.261	pCi/g	07/30/13 13:32	08/02/13 20:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	79		30 - 110					07/30/13 13:32	08/02/13 20:33	1

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	0.862		0.117	0.147		0.104	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Bismuth 212	1.29		0.492	0.510		0.417	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Bismuth 214	0.947		0.0974	0.139		0.0618	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Lead 212	0.959		0.0695	0.142		0.0576	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Lead 214	1.07		0.0836	0.139		0.0672	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Potassium 40	15.6		1.06	1.91		0.363	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Protactinium 231	0.385	U	0.230	0.233		1.11	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Radium 226	0.947		0.0974	0.139	1.00	0.0618	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Thorium 232	0.862		0.117	0.147		0.104	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Thorium 234	1.97		0.810	0.836		0.950	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Uranium 235	0.361		0.130	0.135		0.187	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Americium 241	0.0297	U	0.0641	0.0642		0.107	pCi/g	07/30/13 13:06	08/20/13 08:49	1
Protactinium 234m	1.08	U	2.67	2.67		4.61	pCi/g	07/30/13 13:06	08/20/13 08:49	1

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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

Lab Sample ID: MB 160-63756/1-A

Matrix: Solid

Analysis Batch: 64725

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 63756

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.00053	0.000016	mg/Kg		07/30/13 13:32	08/02/13 19:49	1

Lab Sample ID: LCS 160-63756/2-A

Matrix: Solid

Analysis Batch: 64725

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 63756

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00263	0.00249		mg/Kg		95	80 - 120

Lab Sample ID: 160-3127-1 MS

Matrix: Solid

Analysis Batch: 64725

Client Sample ID: L050238PUI01

Prep Type: Total/NA

Prep Batch: 63756

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00390	0.00302		mg/Kg	☼	78	75 - 125

Lab Sample ID: 160-3127-1 MSD

Matrix: Solid

Analysis Batch: 64725

Client Sample ID: L050238PUI01

Prep Type: Total/NA

Prep Batch: 63756

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00349	0.00301		mg/Kg	☼	86	75 - 125	0	30

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

Lab Sample ID: MB 160-63756/1-A

Matrix: Solid

Analysis Batch: 64726

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 63756

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.07406	U	0.0610	0.0651	1.07	0.182	pCi/g	07/30/13 13:32	08/02/13 19:49	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	94		30 - 110	07/30/13 13:32	08/02/13 19:49	1

Lab Sample ID: LCS 160-63756/2-A

Matrix: Solid

Analysis Batch: 64726

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 63756

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	45.1	42.69		4.45	1.13	0.193	pCi/g	95	80 - 120

Carrier	LCS %Yield	LCS Qualifier	Limits
Re	89		30 - 110

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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

Lab Sample ID: 160-3127-1 MS

Matrix: Solid

Analysis Batch: 64726

Client Sample ID: L050238PUI01

Prep Type: Total/NA

Prep Batch: 63756

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.0667	U	66.8	51.76		6.69	1.67	0.286	pCi/g	78	75 - 125
Carrier	MS %Yield	MS Qualifier	Limits								
Re	73		30 - 110								

Lab Sample ID: 160-3127-1 MSD

Matrix: Solid

Analysis Batch: 64726

Client Sample ID: L050238PUI01

Prep Type: Total/NA

Prep Batch: 63756

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	0.0667	U	59.7	51.58		6.02	1.49	0.256	pCi/g	86	75 - 125	0.01	1
Carrier	MSD %Yield	MSD Qualifier	Limits										
Re	82		30 - 110										

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

Lab Sample ID: MB 160-63754/1-A

Matrix: Solid

Analysis Batch: 67615

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 63754

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.008587	U	0.0288	0.0288		0.0830	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Bismuth 212	-0.03736	U	0.147	0.147		0.275	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Bismuth 214	0.0007413	U	0.0218	0.0218		0.0424	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Lead 212	-0.0009133	U	0.0173	0.0173		0.0295	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Lead 214	-0.006692	U	0.0798	0.0798		0.0332	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Potassium 40	-0.07102	U	1.07	1.07		0.397	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Protactinium 231	0.02331	U	0.128	0.128		0.425	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Radium 226	0.0007413	U	0.0218	0.0218	1.00	0.0424	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Thorium 232	0.008587	U	0.0288	0.0288		0.0830	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Thorium 234	0.1087	U	0.0925	0.0932		0.273	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Uranium 235	-0.001146	U	0.0327	0.0327		0.0621	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Americium 241	-0.0003466	U	0.0132	0.0132		0.0246	pCi/g	07/30/13 13:06	08/20/13 04:01	1
Protactinium 234m	0.1972	U	0.864	0.864		2.82	pCi/g	07/30/13 13:06	08/20/13 04:01	1

Lab Sample ID: LCS 160-63754/2-A

Matrix: Solid

Analysis Batch: 67613

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 63754

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	97.7	97.11		10.2		0.982	pCi/g	99	87 - 116
Cesium 137	31.7	31.58		3.31		0.168	pCi/g	100	87 - 120

TestAmerica St. Louis

QC Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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

Lab Sample ID: LCS 160-63754/2-A
Matrix: Solid
Analysis Batch: 67613

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 63754

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Cobalt 60	24.8	24.66		2.50		0.0932	pCi/g	99	87 - 115

Lab Sample ID: 160-3127-1 DU
Matrix: Solid
Analysis Batch: 67608

Client Sample ID: L050238PUI01
Prep Type: Total/NA
Prep Batch: 63754

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	Limit
Actinium 228	0.808		0.8007		0.144		0.0940	pCi/g	0.03	1
Bismuth 212	0.977		0.9652		0.394		0.372	pCi/g	0.02	1
Bismuth 214	0.822		0.7592		0.118		0.0620	pCi/g	0.26	1
Lead 212	0.745		0.5916		0.0981		0.0695	pCi/g	0.72	1
Lead 214	0.890		0.9701		0.129		0.0742	pCi/g	0.33	1
Potassium 40	14.4		14.44		1.76		0.214	pCi/g	0.01	1
Protactinium 231	0.513	U	0.4209	U	0.286		0.957	pCi/g	0.15	1
Radium 226	0.822		0.7592		0.118	1.00	0.0620	pCi/g	0.26	1
Thorium 232	0.808		0.8007		0.144		0.0940	pCi/g	0.03	1
Thorium 234	2.92		2.736		0.836		0.916	pCi/g	0.11	1
Uranium 235	0.855		0.7134		0.202		0.206	pCi/g	0.38	1
Americium 241	0.0383	U	-0.01705	U	0.0611		0.102	pCi/g	0.45	1
Protactinium 234m	4.18	U	2.668	U	2.71		4.64	pCi/g	0.29	1

QC Association Summary

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Metals

Prep Batch: 63756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	None	
160-3127-1 MS	L050238PUI01	Total/NA	Solid	None	
160-3127-1 MSD	L050238PUI01	Total/NA	Solid	None	
160-3127-2	L050238PUI02	Total/NA	Solid	None	
160-3127-3	L050238PUI03	Total/NA	Solid	None	
160-3127-4	L050238PUI04	Total/NA	Solid	None	
160-3127-5	L050238PUI05	Total/NA	Solid	None	
160-3127-6	L050238PUI06	Total/NA	Solid	None	
LCS 160-63756/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-63756/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 64725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	6020A	63756
160-3127-1 MS	L050238PUI01	Total/NA	Solid	6020A	63756
160-3127-1 MSD	L050238PUI01	Total/NA	Solid	6020A	63756
160-3127-2	L050238PUI02	Total/NA	Solid	6020A	63756
160-3127-3	L050238PUI03	Total/NA	Solid	6020A	63756
160-3127-4	L050238PUI04	Total/NA	Solid	6020A	63756
160-3127-5	L050238PUI05	Total/NA	Solid	6020A	63756
160-3127-6	L050238PUI06	Total/NA	Solid	6020A	63756
LCS 160-63756/2-A	Lab Control Sample	Total/NA	Solid	6020A	63756
MB 160-63756/1-A	Method Blank	Total/NA	Solid	6020A	63756

General Chemistry

Analysis Batch: 63152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	Moisture	
160-3127-2	L050238PUI02	Total/NA	Solid	Moisture	
160-3127-3	L050238PUI03	Total/NA	Solid	Moisture	
160-3127-4	L050238PUI04	Total/NA	Solid	Moisture	
160-3127-5	L050238PUI05	Total/NA	Solid	Moisture	
160-3127-6	L050238PUI06	Total/NA	Solid	Moisture	
160-3127-6 DU	L050238PUI06	Total/NA	Solid	Moisture	

Rad

Leach Batch: 63194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	Dry and Grind	
160-3127-1 DU	L050238PUI01	Total/NA	Solid	Dry and Grind	
160-3127-2	L050238PUI02	Total/NA	Solid	Dry and Grind	
160-3127-3	L050238PUI03	Total/NA	Solid	Dry and Grind	
160-3127-4	L050238PUI04	Total/NA	Solid	Dry and Grind	
160-3127-5	L050238PUI05	Total/NA	Solid	Dry and Grind	
160-3127-6	L050238PUI06	Total/NA	Solid	Dry and Grind	

TestAmerica St. Louis

QC Association Summary

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

Rad (Continued)

Prep Batch: 63754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	Fill_Geo-21	63194
160-3127-1 DU	L050238PUI01	Total/NA	Solid	Fill_Geo-21	63194
160-3127-2	L050238PUI02	Total/NA	Solid	Fill_Geo-21	63194
160-3127-3	L050238PUI03	Total/NA	Solid	Fill_Geo-21	63194
160-3127-4	L050238PUI04	Total/NA	Solid	Fill_Geo-21	63194
160-3127-5	L050238PUI05	Total/NA	Solid	Fill_Geo-21	63194
160-3127-6	L050238PUI06	Total/NA	Solid	Fill_Geo-21	63194
LCS 160-63754/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-63754/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	

Prep Batch: 63756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3127-1	L050238PUI01	Total/NA	Solid	None	
160-3127-1 MS	L050238PUI01	Total/NA	Solid	None	
160-3127-1 MSD	L050238PUI01	Total/NA	Solid	None	
160-3127-2	L050238PUI02	Total/NA	Solid	None	
160-3127-3	L050238PUI03	Total/NA	Solid	None	
160-3127-4	L050238PUI04	Total/NA	Solid	None	
160-3127-5	L050238PUI05	Total/NA	Solid	None	
160-3127-6	L050238PUI06	Total/NA	Solid	None	
LCS 160-63756/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-63756/1-A	Method Blank	Total/NA	Solid	None	

Tracer/Carrier Summary

Client: Westinghouse Electric Company LLC
Project/Site: RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-3127-1

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)	
160-3127-1	L050238PUI01	71	
160-3127-1 MS	L050238PUI01	73	
160-3127-1 MSD	L050238PUI01	82	
160-3127-2	L050238PUI02	75	
160-3127-3	L050238PUI03	85	
160-3127-4	L050238PUI04	81	
160-3127-5	L050238PUI05	83	
160-3127-6	L050238PUI06	79	
LCS 160-63756/2-A	Lab Control Sample	89	
MB 160-63756/1-A	Method Blank	94	

Tracer/Carrier Legend

Re = Re