

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: 160-17641-1

Client Project/Site: HDP RFP-CBA-022 (7 DAY TAT)
Revision: 1

For:

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

Attn: Mr. Martin Swanson



Authorized for release by:
6/15/2016 2:44:57 PM

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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: 160-17641-1

Job ID: 160-17641-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-17641-1 - Revision 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. This revision corrects the format of the case narrative.

RECEIPT

The samples were received on 6/3/2016 11:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 20.0° C and 20.0° C.

TECHNETIUM-99 (ICPMS)

Samples L11-06-01-P-S-S-00 (160-17641-1), L11-06-02-P-R-S-00 (160-17641-2), L11-06-04-P-S-S-00 (160-17641-3), L11-06-05-P-R-S-00 (160-17641-4), L11-06-07-P-S-S-00 (160-17641-5), L11-06-08-P-R-S-00 (160-17641-6), L11-06-10-P-S-S-00 (160-17641-7), L11-06-11-P-R-S-00 (160-17641-8), L11-06-13-P-S-S-00 (160-17641-9), L11-06-14-P-R-S-00 (160-17641-10), L11-06-16-P-S-S-00 (160-17641-11), L11-06-17-P-R-S-00 (160-17641-12), L11-06-17-P-R-Q-00 (160-17641-13), L11-06-19-P-S-S-00 (160-17641-14), L11-06-20-P-R-S-00 (160-17641-15), L11-06-22-P-S-S-00 (160-17641-16), L11-06-23-P-R-S-00 (160-17641-17) and L11-06-23-P-R-Q-00 (160-17641-18) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/06/2016 and analyzed on 06/08/2016.

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

Case Narrative

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

TestAmerica Job ID: 160-17641-1

Job ID: 160-17641-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

PERCENT SOLIDS

Samples L11-06-01-P-S-S-00 (160-17641-1), L11-06-02-P-R-S-00 (160-17641-2), L11-06-04-P-S-S-00 (160-17641-3), L11-06-05-P-R-S-00 (160-17641-4), L11-06-07-P-S-S-00 (160-17641-5), L11-06-08-P-R-S-00 (160-17641-6), L11-06-10-P-S-S-00 (160-17641-7), L11-06-11-P-R-S-00 (160-17641-8), L11-06-13-P-S-S-00 (160-17641-9), L11-06-14-P-R-S-00 (160-17641-10), L11-06-16-P-S-S-00 (160-17641-11), L11-06-17-P-R-S-00 (160-17641-12), L11-06-17-P-R-Q-00 (160-17641-13), L11-06-19-P-S-S-00 (160-17641-14), L11-06-20-P-R-S-00 (160-17641-15), L11-06-22-P-S-S-00 (160-17641-16), L11-06-23-P-R-S-00 (160-17641-17) and L11-06-23-P-R-Q-00 (160-17641-18) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 06/06/2016.

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 L11-06-01-P-S-S-00 (160-17641-1), L11-06-02-P-R-S-00 (160-17641-2), L11-06-04-P-S-S-00 (160-17641-3), L11-06-05-P-R-S-00 (160-17641-4), L11-06-07-P-S-S-00 (160-17641-5), L11-06-08-P-R-S-00 (160-17641-6), L11-06-10-P-S-S-00 (160-17641-7), L11-06-11-P-R-S-00 (160-17641-8), L11-06-13-P-S-S-00 (160-17641-9), L11-06-14-P-R-S-00 (160-17641-10), L11-06-16-P-S-S-00 (160-17641-11), L11-06-17-P-R-S-00 (160-17641-12), L11-06-17-P-R-Q-00 (160-17641-13), L11-06-19-P-S-S-00 (160-17641-14), L11-06-20-P-R-S-00 (160-17641-15), L11-06-22-P-S-S-00 (160-17641-16), L11-06-23-P-R-S-00 (160-17641-17) and L11-06-23-P-R-Q-00 (160-17641-18) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 06/03/2016, prepared on 06/06/2016 and analyzed on 06/06/2016 and 06/07/2016.

Preparation Batch 160-254924:

Radium-226 is reported in these samples at the client's request. Radium-226 is reported from the 609.31 keV line of bismuth-214. Because the samples have not had a 21-day ingrowth, the activity for radium-226 is an estimated value and may be biased low. This bias is caused by the disruption of secular equilibrium between radium-226 and bismuth-214 by the loss of radon-222 during sample preparation. L11-06-01-P-S-S-00 (160-17641-1), L11-06-02-P-R-S-00 (160-17641-2), L11-06-04-P-S-S-00 (160-17641-3), L11-06-05-P-R-S-00 (160-17641-4), L11-06-07-P-S-S-00 (160-17641-5), L11-06-08-P-R-S-00 (160-17641-6), L11-06-10-P-S-S-00 (160-17641-7), L11-06-11-P-R-S-00 (160-17641-8), L11-06-13-P-S-S-00 (160-17641-9), L11-06-14-P-R-S-00 (160-17641-10), L11-06-16-P-S-S-00 (160-17641-11), L11-06-17-P-R-S-00 (160-17641-12), L11-06-17-P-R-Q-00 (160-17641-13), L11-06-19-P-S-S-00 (160-17641-14), L11-06-20-P-R-S-00 (160-17641-15), L11-06-22-P-S-S-00 (160-17641-16), L11-06-23-P-R-S-00 (160-17641-17), L11-06-23-P-R-Q-00 (160-17641-18), (LCS 160-254924/2-A), (MB 160-254924/1-A) and (160-17641-A-1-D 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												Page 1 of 1		
				Revision: 4														
				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-060216-02 Page 1/2				Requested Analysis												Laboratory Name: TA-MO Laboratory Address: 13715 Rider Trail North Phone No. 314-298-8566 Laboratory Contact Person: Ivan Vania Phone No. 708-870-8453 Turn Around Time Rush (7 days) Remarks		
Project Name: Westinghouse Electric Company				Total Containers	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)										
Contact Person: Clark Evers																		
Phone Number: 314-810-3336																		
Sampler Name: Donte Love/Jahmai Williams																		
Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)										
L11-06-01-P-S-S-00	6/2/2016	9:20	S	G	X		X	X									1 LSA 11-06	
L11-06-02-P-R-S-00	6/2/2016	9:30	S	C	X		X	X									1 LSA 11-06	
L11-06-04-P-S-S-00	6/1/2016	15:45	S	G	X		X	X									1 LSA 11-06	
L11-06-05-P-R-S-00	6/1/2016	16:00	S	C	X		X	X									1 LSA 11-06	
L11-06-07-P-S-S-00	6/2/2016	8:40	S	G	X		X	X									1 LSA 11-06	
L11-06-08-P-R-S-00	6/2/2016	8:45	S	C	X		X	X									1 LSA 11-06	
L11-06-10-P-S-S-00	6/2/2016	11:00	S	G	X		X	X									1 LSA 11-06	
L11-06-11-P-R-S-00	6/2/2016	11:10	S	C	X		X	X									1 LSA 11-06	
L11-06-13-P-S-S-00	6/1/2016	15:20	S	G	X		X	X									1 LSA 11-06	
L11-06-14-P-R-S-00	6/1/2016	15:30	S	C	X		X	X									1 LSA 11-06	
L11-06-16-P-S-S-00	6/2/2016	9:55	S	G	X		X	X									1 LSA 11-06	
L11-06-17-P-R-S-00	6/2/2016	10:10	S	C	X		X	X									1 LSA 11-06	
Relinquished by: <i>S. M. K. G. M. G.</i>		Date/Time 6/3/16		Received by: <i>[Signature]</i>		Date/Time 6-3-16		Total 18		Cooler Temperature: Ambient								
Company Name: WEC		0935		Company Name: CPS 10075		0935		Cooler ID:		Shipper and Number:								
Received by:		Date/Time		Relinquished by:		Date/Time		Comments: N/A 0602-03/04 <i>Thomas Vania</i> <i>[Signature]</i> Verified By: <i>6-3-16</i>										
Company Name:				Company Name:														
Relinquished by: <i>[Signature]</i>		Date/Time 6-3-16		Received by: <i>[Signature]</i>		Date/Time 0603/16												
Company Name: <i>[Signature]</i>		11:10		Company Name: TH 5TC		1110												



160-17641 Chain of Custody

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-060216-02		Page 2/2		Requested Analysis										Laboratory Name:			
Project Name: Westinghouse Electric Company				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)							Total Containers	Laboratory Address: TA-MO	
Contact Person: Clark Evers																Laboratory Address: 13715 Rider Trail North	
Phone Number: 314-810-3336																Phone No. 314-298-8566	
Sampler Name: Donte Love/Jahmai Williams																Laboratory Contact Person: Ivan Vania	
																Phone No. 708-870-8453	
																Turn Around Time	
																Rush (7 days)	
																Remarks	
Sample ID	Date	Time	Matrix														
L11-06-17-P-R-Q-00	6/2/2016	10:10	S	C	X		X	X							1	LSA 11-06	
L11-06-19-P-S-S-00	5/31/2016	15:30	S	G	X		X	X							1	LSA 11-06	
L11-06-20-P-R-S-00	5/31/2016	15:35	S	C	X		X	X							1	LSA 11-06	
L11-06-22-P-S-S-00	5/31/2016	15:10	S	G	X		X	X							1	LSA 11-06	
L11-06-23-P-R-S-00	5/31/2016	15:20	S	C	X		X	X							1	LSA 11-06	
L11-06-23-P-R-Q-00	5/31/2016	15:20	S	C	X		X	X							1	LSA 11-06	
Relinquished by: <i>J. MICHAEL G. MOORE</i>		Date/Time 6/3/16 0935		Received by: <i>TRB</i>		Date/Time 6-3-16 09:05		Total 18		Cooler Temperature: Ambient		Cooler ID:		Shipper and Number:		Comments: N/A 0602-03/04 Thomas Yarrick	
Company Name: WEC				Company Name: CROSS ROADS													
Received by:		Date/Time		Relinquished by:		Date/Time											
Company Name:				Company Name:													
Relinquished by: <i>TRB</i>		Date/Time 6-3-16 1110		Received by: <i>C. McK</i>		Date/Time 060316 1110										Verified By: 6-3-16	
Company Name: CROSS ROADS				Company Name: THSTC													

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-17641-1

Login Number: 17641

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.	False	Thermal preservation not required.
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: 160-17641-1

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: 160-17641-1

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: 160-17641-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17641-1	L11-06-01-P-S-S-00	Solid	06/02/16 09:20	06/03/16 11:10
160-17641-2	L11-06-02-P-R-S-00	Solid	06/02/16 09:30	06/03/16 11:10
160-17641-3	L11-06-04-P-S-S-00	Solid	06/01/16 15:45	06/03/16 11:10
160-17641-4	L11-06-05-P-R-S-00	Solid	06/01/16 16:00	06/03/16 11:10
160-17641-5	L11-06-07-P-S-S-00	Solid	06/02/16 08:40	06/03/16 11:10
160-17641-6	L11-06-08-P-R-S-00	Solid	06/02/16 08:45	06/03/16 11:10
160-17641-7	L11-06-10-P-S-S-00	Solid	06/02/16 11:00	06/03/16 11:10
160-17641-8	L11-06-11-P-R-S-00	Solid	06/02/16 11:10	06/03/16 11:10
160-17641-9	L11-06-13-P-S-S-00	Solid	06/01/16 15:20	06/03/16 11:10
160-17641-10	L11-06-14-P-R-S-00	Solid	06/01/16 15:30	06/03/16 11:10
160-17641-11	L11-06-16-P-S-S-00	Solid	06/02/16 09:55	06/03/16 11:10
160-17641-12	L11-06-17-P-R-S-00	Solid	06/02/16 10:10	06/03/16 11:10
160-17641-13	L11-06-17-P-R-Q-00	Solid	06/02/16 10:10	06/03/16 11:10
160-17641-14	L11-06-19-P-S-S-00	Solid	05/31/16 15:30	06/03/16 11:10
160-17641-15	L11-06-20-P-R-S-00	Solid	05/31/16 15:35	06/03/16 11:10
160-17641-16	L11-06-22-P-S-S-00	Solid	05/31/16 15:10	06/03/16 11:10
160-17641-17	L11-06-23-P-R-S-00	Solid	05/31/16 15:20	06/03/16 11:10
160-17641-18	L11-06-23-P-R-Q-00	Solid	05/31/16 15:20	06/03/16 11:10

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-01-P-S-S-00

Lab Sample ID: 160-17641-1

Date Collected: 06/02/16 09:20

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.196		0.158	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Americium 241	-0.0479	U	0.106	0.107		0.141	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Bismuth 212	0.311	U	0.543	0.543		0.910	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Bismuth 214	1.06		0.134	0.174		0.0828	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Lead 212	0.958		0.0827	0.149		0.0680	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Lead 214	1.10		0.106	0.156		0.0847	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Potassium 40	17.4		1.40	2.26		0.298	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Protactinium 231	0.000	U	0.556	0.556		2.76	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Radium 226	1.06		0.134	0.174	1.00	0.0828	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Thorium 234	1.48		0.613	0.632	1.00	0.942	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Uranium 235	-0.135	U	0.312	0.313		0.657	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Protactinium 234m	4.42	U	7.34	7.35		10.9	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Thorium 232	1.10		0.160	0.196		0.158	pCi/g	06/06/16 13:02	06/06/16 21:45	1
Other Detected Radionuclides			Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.301		0.0537	0.0622		0.0385	pCi/g	06/06/16 13:02	06/06/16 21:45	1

Client Sample ID: L11-06-01-P-S-S-00

Lab Sample ID: 160-17641-1

Date Collected: 06/02/16 09:20

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 79.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000071	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 09:21	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	0.111	U	0.0365	0.0379	1.41	0.242	pCi/g	06/06/16 18:24	06/08/16 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	89		30 - 110					06/06/16 18:24	06/08/16 09:21	1

Client Sample ID: L11-06-02-P-R-S-00

Lab Sample ID: 160-17641-2

Date Collected: 06/02/16 09:30

Matrix: Solid

Date Received: 06/03/16 11:10

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		0.144	0.180		0.133	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Americium 241	0.00307	U	0.0974	0.0974		0.163	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Bismuth 212	1.29		0.395	0.417		0.461	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Bismuth 214	0.901		0.124	0.155		0.0863	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Lead 212	1.09		0.0831	0.164		0.0670	pCi/g	06/06/16 13:02	06/06/16 21:46	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-02-P-R-S-00

Lab Sample ID: 160-17641-2

Date Collected: 06/02/16 09:30

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.990		0.0998	0.143		0.0788	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Potassium 40	17.9		1.32	2.26		0.179	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Protactinium 231	0.000	U	0.439	0.439		2.63	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Radium 226	0.901		0.124	0.155	1.00	0.0863	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Thorium 234	0.989		0.528	0.538	1.00	0.829	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Uranium 235	0.137	U	0.208	0.208		0.314	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Protactinium 234m	1.10	U	3.79	3.80		10.8	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Thorium 232	1.06		0.144	0.180		0.133	pCi/g	06/06/16 13:02	06/06/16 21:46	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.322		0.0586	0.0675		0.0441	pCi/g	06/06/16 13:02	06/06/16 21:46	1

Client Sample ID: L11-06-02-P-R-S-00

Lab Sample ID: 160-17641-2

Date Collected: 06/02/16 09:30

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 78.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000070	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 09:34	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	0.0310	U	0.00330	0.00436	1.39	0.238	pCi/g	06/06/16 18:24	06/08/16 09:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	92		30 - 110					06/06/16 18:24	06/08/16 09:34	1

Client Sample ID: L11-06-04-P-S-S-00

Lab Sample ID: 160-17641-3

Date Collected: 06/01/16 15:45

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.819		0.113	0.139		0.118	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Americium 241	-0.0327	U	0.0403	0.0404		0.148	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Bismuth 212	1.18		0.325	0.347		0.260	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Bismuth 214	0.800		0.0895	0.122		0.0609	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Lead 212	0.761		0.0604	0.116		0.0528	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Lead 214	0.831		0.0792	0.117		0.0544	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Potassium 40	16.9		1.04	2.00		0.298	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Protactinium 231	-0.450	U	1.32	1.32		2.20	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Radium 226	0.800		0.0895	0.122	1.00	0.0609	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Thorium 234	1.42		0.445	0.469	1.00	0.665	pCi/g	06/06/16 13:02	06/06/16 21:47	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-04-P-S-S-00

Lab Sample ID: 160-17641-3

Date Collected: 06/01/16 15:45

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.190		0.119	0.120		0.179	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Protactinium 234m	3.47	U	4.04	4.05		6.73	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Thorium 232	0.819		0.113	0.139		0.118	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.49		0.543	0.570		0.684	pCi/g	06/06/16 13:02	06/06/16 21:47	1
Tl-208	0.300		0.0452	0.0547		0.0340	pCi/g	06/06/16 13:02	06/06/16 21:47	1

Client Sample ID: L11-06-04-P-S-S-00

Lab Sample ID: 160-17641-3

Date Collected: 06/01/16 15:45

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 77.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000070	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 09:38	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	0.338		0.0144	0.0342	1.40	0.239	pCi/g	06/06/16 18:24	06/08/16 09:38	1
Carrier										
Re	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
	92		30 - 110					06/06/16 18:24	06/08/16 09:38	1

Client Sample ID: L11-06-05-P-R-S-00

Lab Sample ID: 160-17641-4

Date Collected: 06/01/16 16:00

Matrix: Solid

Date Received: 06/03/16 11:10

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	1.05		0.145	0.181		0.159	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Americium 241	0.0734	U	0.0720	0.0724		0.0943	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Bismuth 212	1.55		0.549	0.572		0.493	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Bismuth 214	0.841		0.123	0.150		0.0816	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Lead 212	1.05		0.0883	0.162		0.0749	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Lead 214	0.892		0.109	0.143		0.0921	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Potassium 40	16.8		1.40	2.21		0.304	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Protactinium 231	0.346	U	1.16	1.17		2.86	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Radium 226	0.841		0.123	0.150	1.00	0.0816	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Thorium 234	1.22		0.615	0.628	1.00	0.962	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Uranium 235	0.135	U	0.227	0.227		0.399	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Protactinium 234m	-0.0739	U	5.85	5.85		11.1	pCi/g	06/06/16 13:02	06/06/16 22:16	1
Thorium 232	1.05		0.145	0.181		0.159	pCi/g	06/06/16 13:02	06/06/16 22:16	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-05-P-R-S-00

Lab Sample ID: 160-17641-4

Date Collected: 06/01/16 16:00

Matrix: Solid

Date Received: 06/03/16 11:10

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.353		0.0613	0.0714		0.0475	pCi/g	06/06/16 13:02	06/06/16 22:16	1

Client Sample ID: L11-06-05-P-R-S-00

Lab Sample ID: 160-17641-4

Date Collected: 06/01/16 16:00

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 76.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000071	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 09:42	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	0.0122	U	0.103	0.103	1.43	0.244	pCi/g	06/06/16 18:24	06/08/16 09:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	92		30 - 110					06/06/16 18:24	06/08/16 09:42	1

Client Sample ID: L11-06-07-P-S-S-00

Lab Sample ID: 160-17641-5

Date Collected: 06/02/16 08:40

Matrix: Solid

Date Received: 06/03/16 11:10

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	1.05		0.113	0.155		0.0795	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Americium 241	-0.00172	U	0.0896	0.0896		0.150	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Bismuth 212	1.23		0.461	0.478		0.414	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Bismuth 214	0.919		0.100	0.138		0.0660	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Lead 212	0.952		0.0680	0.141		0.0565	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Lead 214	1.03		0.0859	0.137		0.0659	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Potassium 40	15.0		1.39	2.05		1.65	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Protactinium 231	0.254	U	0.787	0.787		2.14	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Radium 226	0.919		0.100	0.138	1.00	0.0660	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Thorium 234	1.44		0.522	0.543	1.00	0.802	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Uranium 235	-0.133	U	0.141	0.142		0.551	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Protactinium 234m	2.10	U	3.33	3.34		8.60	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Thorium 232	1.05		0.113	0.155		0.0795	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.62		0.684	0.710		0.806	pCi/g	06/06/16 13:02	06/06/16 22:19	1
Tl-208	0.300		0.0415	0.0517		0.0302	pCi/g	06/06/16 13:02	06/06/16 22:19	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-07-P-S-S-00

Lab Sample ID: 160-17641-5

Date Collected: 06/02/16 08:40

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 76.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000071	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 09:47	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	0.281		0.0806	0.0847	1.43	0.245	pCi/g	06/06/16 18:24	06/08/16 09:47	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	91		30 - 110	06/06/16 18:24	06/08/16 09:47	1

Client Sample ID: L11-06-08-P-R-S-00

Lab Sample ID: 160-17641-6

Date Collected: 06/02/16 08:45

Matrix: Solid

Date Received: 06/03/16 11:10

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.17		0.164	0.203		0.138	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Americium 241	-0.0141	U	0.0968	0.0968		0.129	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Bismuth 212	0.259	U	0.545	0.546		0.919	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Bismuth 214	0.901		0.110	0.144		0.0655	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Lead 212	0.960		0.0797	0.148		0.0694	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Lead 214	1.04		0.102	0.149		0.0849	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Potassium 40	17.0		1.35	2.21		0.421	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Protactinium 231	-0.523	U	1.66	1.66		2.78	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Radium 226	0.901		0.110	0.144	1.00	0.0655	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Thorium 234	0.846	U	0.326	0.338	1.00	0.934	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Uranium 235	0.0935	U	0.207	0.208		0.346	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Protactinium 234m	2.76	U	4.36	4.37		10.5	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Thorium 232	1.17		0.164	0.203		0.138	pCi/g	06/06/16 13:02	06/06/16 22:52	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.309		0.0534	0.0623		0.0435	pCi/g	06/06/16 13:02	06/06/16 22:52	1

Client Sample ID: L11-06-08-P-R-S-00

Lab Sample ID: 160-17641-6

Date Collected: 06/02/16 08:45

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 76.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000072	0.000022	mg/Kg	☼	06/06/16 18:24	06/08/16 09:51	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	-0.0197	U	0.0463	0.0463	1.44	0.246	pCi/g	06/06/16 18:24	06/08/16 09:51	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-08-P-R-S-00

Date Collected: 06/02/16 08:45

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-6

Matrix: Solid

Percent Solids: 76.7

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	91		30 - 110	06/06/16 18:24	06/08/16 09:51	1

Client Sample ID: L11-06-10-P-S-S-00

Date Collected: 06/02/16 11:00

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-7

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	1.02		0.130	0.167		0.121	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Americium 241	-0.0390	U	0.0900	0.0901		0.150	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Bismuth 212	1.40		0.460	0.482		0.396	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Bismuth 214	0.794		0.0857	0.119		0.0567	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Lead 212	1.11		0.0695	0.160		0.0512	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Lead 214	0.854		0.0795	0.119		0.0781	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Potassium 40	17.4		1.08	2.08		0.346	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Protactinium 231	0.000	U	0.393	0.393		2.04	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Radium 226	0.794		0.0857	0.119	1.00	0.0567	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Thorium 234	1.29		0.630	0.644	1.00	0.788	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Uranium 235	0.00262	U	0.293	0.293		0.489	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Protactinium 234m	1.68	U	2.62	2.63		8.62	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Thorium 232	1.02		0.130	0.167		0.121	pCi/g	06/06/16 13:02	06/06/16 22:52	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.351		0.0476	0.0599		0.0338	pCi/g	06/06/16 13:02	06/06/16 22:52	1

Client Sample ID: L11-06-10-P-S-S-00

Date Collected: 06/02/16 11:00

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-7

Matrix: Solid

Percent Solids: 73.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00019		0.000074	0.000022	mg/Kg	☼	06/06/16 18:24	06/08/16 09:55	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	3.23		0.0944	0.312	1.49	0.255	pCi/g	06/06/16 18:24	06/08/16 09:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	92		30 - 110					06/06/16 18:24	06/08/16 09:55	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-11-P-R-S-00

Lab Sample ID: 160-17641-8

Date Collected: 06/02/16 11:10

Matrix: Solid

Date Received: 06/03/16 11:10

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		0.167	0.204		0.0436	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Americium 241	0.0442	U	0.104	0.104		0.173	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Bismuth 212	1.19		0.434	0.451		0.418	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Bismuth 214	0.694		0.106	0.128		0.0841	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Lead 212	0.946		0.0792	0.146		0.0667	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Lead 214	0.744		0.0806	0.112		0.0796	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Potassium 40	15.0		1.28	2.00		0.396	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Protactinium 231	-0.534	U	1.64	1.64		2.73	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Radium 226	0.694		0.106	0.128	1.00	0.0841	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Thorium 234	0.717	U	0.321	0.329	1.00	0.931	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Uranium 235	-0.136	U	0.126	0.127		0.597	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Protactinium 234m	2.62	U	4.35	4.36		10.1	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Thorium 232	1.15		0.167	0.204		0.0436	pCi/g	06/06/16 13:02	06/06/16 22:53	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
TI-208	0.346		0.0531	0.0641		0.0340	pCi/g	06/06/16 13:02	06/06/16 22:53	1

Client Sample ID: L11-06-11-P-R-S-00

Lab Sample ID: 160-17641-8

Date Collected: 06/02/16 11:10

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 73.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000067	J	0.000072	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 10:00	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	1.14		0.0679	0.125	1.43	0.245	pCi/g	06/06/16 18:24	06/08/16 10:00	1
Carrier	%Yield	Qualifier	Limits							
Re	94		30 - 110							
								Prepared	Analyzed	Dil Fac
								06/06/16 18:24	06/08/16 10:00	1

Client Sample ID: L11-06-13-P-S-S-00

Lab Sample ID: 160-17641-9

Date Collected: 06/01/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.779		0.107	0.133		0.110	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Americium 241	-0.0338	U	0.0491	0.0492		0.186	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Bismuth 212	0.0197	U	0.464	0.464		0.798	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Bismuth 214	0.982		0.0978	0.141		0.0575	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Lead 212	0.826		0.0664	0.126		0.0592	pCi/g	06/06/16 13:02	06/06/16 22:54	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-13-P-S-S-00

Lab Sample ID: 160-17641-9

Date Collected: 06/01/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

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	1.10		0.0965	0.150		0.0762	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Potassium 40	15.6		1.07	1.89		0.387	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Protactinium 231	0.0358	U	0.497	0.497		2.17	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Radium 226	0.982		0.0978	0.141	1.00	0.0575	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Thorium 234	1.71		0.534	0.564	1.00	0.806	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Uranium 235	0.0791	U	0.154	0.154		0.257	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Protactinium 234m	1.76	U	3.05	3.05		8.12	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Thorium 232	0.779		0.107	0.133		0.110	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.84		0.661	0.695		0.784	pCi/g	06/06/16 13:02	06/06/16 22:54	1
Tl-208	0.221		0.0413	0.0472		0.0370	pCi/g	06/06/16 13:02	06/06/16 22:54	1

Client Sample ID: L11-06-13-P-S-S-00

Lab Sample ID: 160-17641-9

Date Collected: 06/01/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 81.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000030	J	0.000066	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:17	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	0.509		0.104	0.114	1.32	0.225	pCi/g	06/06/16 18:24	06/08/16 10:17	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	94		30 - 110					06/06/16 18:24	06/08/16 10:17	1

Client Sample ID: L11-06-14-P-R-S-00

Lab Sample ID: 160-17641-10

Date Collected: 06/01/16 15:30

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.971		0.135	0.167		0.108	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Americium 241	-0.0285	U	0.0797	0.0797		0.112	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Bismuth 212	1.40		0.407	0.432		0.353	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Bismuth 214	0.892		0.104	0.139		0.0620	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Lead 212	0.940		0.0776	0.144		0.0703	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Lead 214	0.928		0.0905	0.132		0.0831	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Potassium 40	17.0		1.23	2.13		0.278	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Protactinium 231	0.204	U	0.625	0.625		2.02	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Radium 226	0.892		0.104	0.139	1.00	0.0620	pCi/g	06/06/16 13:02	06/07/16 05:19	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-14-P-R-S-00

Lab Sample ID: 160-17641-10

Date Collected: 06/01/16 15:30

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.831	U	0.330	0.342	1.00	0.834	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Uranium 235	0.0125	U	0.0930	0.0931		0.346	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Protactinium 234m	2.71	U	5.49	5.50		9.08	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Thorium 232	0.971		0.135	0.167		0.108	pCi/g	06/06/16 13:02	06/07/16 05:19	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.325		0.0480	0.0586		0.0345	pCi/g	06/06/16 13:02	06/07/16 05:19	1

Client Sample ID: L11-06-14-P-R-S-00

Lab Sample ID: 160-17641-10

Date Collected: 06/01/16 15:30

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 79.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000067	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:21	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	0.0759	U	0.0883	0.0886	1.34	0.230	pCi/g	06/06/16 18:24	06/08/16 10:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	95		30 - 110					06/06/16 18:24	06/08/16 10:21	1

Client Sample ID: L11-06-16-P-S-S-00

Lab Sample ID: 160-17641-11

Date Collected: 06/02/16 09:55

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.772		0.111	0.136		0.0749	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Americium 241	-0.0298	U	0.0868	0.0868		0.144	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Bismuth 212	0.674		0.267	0.276		0.360	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Bismuth 214	0.732		0.0782	0.109		0.0444	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Lead 212	0.695		0.0588	0.107		0.0529	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Lead 214	0.872		0.0862	0.125		0.0613	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Potassium 40	13.7		0.943	1.69		0.271	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Protactinium 231	0.363	U	0.813	0.814		1.82	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Radium 226	0.732		0.0782	0.109	1.00	0.0444	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Thorium 234	1.03		0.262	0.283	1.00	0.713	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Uranium 235	0.103	U	0.210	0.210		0.471	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Protactinium 234m	0.945	U	1.58	1.59		8.72	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Thorium 232	0.772		0.111	0.136		0.0749	pCi/g	06/06/16 13:02	06/06/16 23:24	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-16-P-S-S-00

Lab Sample ID: 160-17641-11

Date Collected: 06/02/16 09:55

Matrix: Solid

Date Received: 06/03/16 11:10

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.26		0.484	0.506		0.637	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Tl-208	0.236		0.0375	0.0448		0.0294	pCi/g	06/06/16 13:02	06/06/16 23:24	1

Client Sample ID: L11-06-16-P-S-S-00

Lab Sample ID: 160-17641-11

Date Collected: 06/02/16 09:55

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 80.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000067	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:25	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	0.326		0.0460	0.0549	1.34	0.230	pCi/g	06/06/16 18:24	06/08/16 10:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	92		30 - 110					06/06/16 18:24	06/08/16 10:25	1

Client Sample ID: L11-06-17-P-R-S-00

Lab Sample ID: 160-17641-12

Date Collected: 06/02/16 10:10

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.946		0.126	0.159		0.0943	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Americium 241	-0.00419	U	0.0771	0.0771		0.109	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Bismuth 212	0.322	U	0.593	0.594		0.991	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Bismuth 214	0.804		0.101	0.131		0.0667	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Lead 212	0.904		0.0747	0.139		0.0685	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Lead 214	0.874		0.0851	0.125		0.0561	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Potassium 40	16.9		1.20	2.10		0.265	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Protactinium 231	0.000	U	0.344	0.344		2.02	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Radium 226	0.804		0.101	0.131	1.00	0.0667	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Thorium 234	1.03		0.494	0.506	1.00	0.770	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Uranium 235	0.0493	U	0.104	0.104		0.397	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Protactinium 234m	-1.03	U	1.23	1.23		11.7	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Thorium 232	0.946		0.126	0.159		0.0943	pCi/g	06/06/16 13:02	06/06/16 23:09	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.329		0.0454	0.0568		0.0312	pCi/g	06/06/16 13:02	06/06/16 23:09	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-17-P-R-S-00

Lab Sample ID: 160-17641-12

Date Collected: 06/02/16 10:10

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 78.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000068	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:30	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	0.0396	U	0.106	0.107	1.36	0.233	pCi/g	06/06/16 18:24	06/08/16 10:30	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	94		30 - 110	06/06/16 18:24	06/08/16 10:30	1

Client Sample ID: L11-06-17-P-R-Q-00

Lab Sample ID: 160-17641-13

Date Collected: 06/02/16 10:10

Matrix: Solid

Date Received: 06/03/16 11:10

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	1.09		0.193	0.223		0.149	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Americium 241	-0.0473	U	0.108	0.108		0.180	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Bismuth 212	1.01		0.385	0.399		0.499	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Bismuth 214	0.766		0.0987	0.127		0.0613	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Lead 212	0.966		0.0771	0.147		0.0581	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Lead 214	0.748		0.0906	0.119		0.0827	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Potassium 40	16.8		1.28	2.15		0.180	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Protactinium 231	-0.543	U	1.64	1.64		2.74	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Radium 226	0.766		0.0987	0.127	1.00	0.0613	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Thorium 234	1.23		0.568	0.582	1.00	0.883	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Uranium 235	-0.133	U	0.213	0.213		0.577	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Protactinium 234m	2.54	U	5.76	5.77		9.64	pCi/g	06/06/16 13:02	06/06/16 23:24	1
Thorium 232	1.09		0.193	0.223		0.149	pCi/g	06/06/16 13:02	06/06/16 23:24	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.303		0.0582	0.0662		0.0473	pCi/g	06/06/16 13:02	06/06/16 23:24	1

Client Sample ID: L11-06-17-P-R-Q-00

Lab Sample ID: 160-17641-13

Date Collected: 06/02/16 10:10

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 79.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000067	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:34	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	0.0570	U	0.0180	0.0188	1.33	0.228	pCi/g	06/06/16 18:24	06/08/16 10:34	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-17-P-R-Q-00

Date Collected: 06/02/16 10:10

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-13

Matrix: Solid

Percent Solids: 79.0

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	95		30 - 110	06/06/16 18:24	06/08/16 10:34	1

Client Sample ID: L11-06-19-P-S-S-00

Date Collected: 05/31/16 15:30

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-14

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	0.802		0.0978	0.127		0.110	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Americium 241	0.0282	U	0.0849	0.0849		0.141	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Bismuth 212	1.39		0.402	0.427		0.338	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Bismuth 214	0.859		0.0913	0.127		0.0625	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Lead 212	0.894		0.0623	0.132		0.0496	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Lead 214	0.891		0.0752	0.120		0.0663	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Potassium 40	17.0		1.03	2.00		0.329	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Protactinium 231	0.000	U	0.370	0.370		2.02	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Radium 226	0.859		0.0913	0.127	1.00	0.0625	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Thorium 234	0.994		0.270	0.289	1.00	0.747	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Uranium 235	-0.122	U	0.528	0.528		0.507	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Protactinium 234m	1.82	U	2.93	2.94		7.69	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Thorium 232	0.802		0.0978	0.127		0.110	pCi/g	06/06/16 13:02	06/06/16 23:26	1
Other Detected Radionuclides										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.314		0.0411	0.0522		0.0289	pCi/g	06/06/16 13:02	06/06/16 23:26	1

Client Sample ID: L11-06-19-P-S-S-00

Date Collected: 05/31/16 15:30

Date Received: 06/03/16 11:10

Lab Sample ID: 160-17641-14

Matrix: Solid

Percent Solids: 73.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000028	J	0.000074	0.000022	mg/Kg	☼	06/06/16 18:24	06/08/16 10:38	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	0.485		0.172	0.177	1.48	0.254	pCi/g	06/06/16 18:24	06/08/16 10:38	1
Carrier										
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	93		30 - 110					06/06/16 18:24	06/08/16 10:38	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-20-P-R-S-00

Lab Sample ID: 160-17641-15

Date Collected: 05/31/16 15:35

Matrix: Solid

Date Received: 06/03/16 11:10

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		0.133	0.171		0.123	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Americium 241	-0.00566	U	0.0740	0.0740		0.105	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Bismuth 212	1.25		0.432	0.451		0.412	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Bismuth 214	0.794		0.104	0.133		0.0811	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Lead 212	0.985		0.0735	0.147		0.0658	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Lead 214	0.928		0.0843	0.128		0.0715	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Potassium 40	18.8		1.20	2.27		0.239	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Protactinium 231	-0.394	U	1.18	1.18		1.98	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Radium 226	0.794		0.104	0.133	1.00	0.0811	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Thorium 234	1.13		0.675	0.685	1.00	0.874	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Uranium 235	0.0704	U	0.181	0.181		0.335	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Protactinium 234m	1.92	U	3.58	3.58		8.62	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Thorium 232	1.06		0.133	0.171		0.123	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Other Detected Radionuclides			Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Pb-210	1.53		0.631	0.656		0.764	pCi/g	06/06/16 13:02	06/06/16 23:41	1
Tl-208	0.363		0.0564	0.0678		0.0431	pCi/g	06/06/16 13:02	06/06/16 23:41	1

Client Sample ID: L11-06-20-P-R-S-00

Lab Sample ID: 160-17641-15

Date Collected: 05/31/16 15:35

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 76.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000069	0.000021	mg/Kg	☼	06/06/16 18:24	06/08/16 10:43	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	-0.0141	U	0.0338	0.0338	1.37	0.235	pCi/g	06/06/16 18:24	06/08/16 10:43	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	96		30 - 110					06/06/16 18:24	06/08/16 10:43	1

Client Sample ID: L11-06-22-P-S-S-00

Lab Sample ID: 160-17641-16

Date Collected: 05/31/16 15:10

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.768		0.121	0.144		0.144	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Americium 241	0.0212	U	0.0767	0.0768		0.103	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Bismuth 212	0.191	U	0.501	0.501		0.852	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Bismuth 214	0.715		0.105	0.129		0.0685	pCi/g	06/06/16 13:02	06/06/16 23:54	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-22-P-S-S-00

Lab Sample ID: 160-17641-16

Date Collected: 05/31/16 15:10

Matrix: Solid

Date Received: 06/03/16 11:10

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 212	0.698		0.0669	0.112		0.0563	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Lead 214	0.825		0.0901	0.124		0.0720	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Potassium 40	14.0		1.19	1.86		0.264	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Protactinium 231	0.164	U	0.743	0.743		2.36	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Radium 226	0.715		0.105	0.129	1.00	0.0685	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Thorium 234	1.27		0.495	0.513	1.00	0.749	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Uranium 235	0.130	U	0.217	0.217		0.493	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Protactinium 234m	-0.0642	U	4.68	4.68		9.31	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Thorium 232	0.768		0.121	0.144		0.144	pCi/g	06/06/16 13:02	06/06/16 23:54	1
Other Detected Radionuclides										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.221		0.0438	0.0494		0.0348	pCi/g	06/06/16 13:02	06/06/16 23:54	1

Client Sample ID: L11-06-22-P-S-S-00

Lab Sample ID: 160-17641-16

Date Collected: 05/31/16 15:10

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 80.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000066	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:47	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	0.0386	U	0.0564	0.0565	1.33	0.227	pCi/g	06/06/16 18:24	06/08/16 10:47	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	94		30 - 110					06/06/16 18:24	06/08/16 10:47	1

Client Sample ID: L11-06-23-P-R-S-00

Lab Sample ID: 160-17641-17

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

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	0.967		0.128	0.162		0.173	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Americium 241	-0.0403	U	0.107	0.107		0.178	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Bismuth 212	1.17		0.456	0.472		0.417	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Bismuth 214	0.738		0.101	0.127		0.0705	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Lead 212	1.00		0.0784	0.151		0.0629	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Lead 214	0.895		0.101	0.137		0.0745	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Potassium 40	15.6		1.21	2.01		0.174	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Protactinium 231	-0.554	U	1.69	1.69		2.82	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Radium 226	0.738		0.101	0.127	1.00	0.0705	pCi/g	06/06/16 13:02	06/06/16 23:57	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-23-P-R-S-00

Lab Sample ID: 160-17641-17

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

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	1.24		0.557	0.572	1.00	0.867	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Uranium 235	-0.147	U	0.204	0.205		0.649	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Protactinium 234m	0.543	U	0.808	0.810		11.5	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Thorium 232	0.967		0.128	0.162		0.173	pCi/g	06/06/16 13:02	06/06/16 23:57	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.313		0.0508	0.0603		0.0356	pCi/g	06/06/16 13:02	06/06/16 23:57	1

Client Sample ID: L11-06-23-P-R-S-00

Lab Sample ID: 160-17641-17

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 79.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000066	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:51	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	0.00681	U	0.0966	0.0966	1.33	0.227	pCi/g	06/06/16 18:24	06/08/16 10:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	95		30 - 110					06/06/16 18:24	06/08/16 10:51	1

Client Sample ID: L11-06-23-P-R-Q-00

Lab Sample ID: 160-17641-18

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

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		0.126	0.171		0.122	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Americium 241	0.0314	U	0.0883	0.0883		0.147	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Bismuth 212	1.26		0.412	0.432		0.389	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Bismuth 214	0.982		0.0954	0.139		0.0590	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Lead 212	1.05		0.0708	0.154		0.0608	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Lead 214	1.04		0.0952	0.144		0.0730	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Potassium 40	21.3		1.18	2.45		0.358	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Protactinium 231	0.162	U	0.544	0.544		0.924	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Radium 226	0.982		0.0954	0.139	1.00	0.0590	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Thorium 234	1.60		0.527	0.553	1.00	0.805	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Uranium 235	-0.130	U	0.155	0.155		0.554	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Protactinium 234m	0.514	U	4.79	4.79		8.22	pCi/g	06/06/16 13:02	06/06/16 23:58	1
Thorium 232	1.15		0.126	0.171		0.122	pCi/g	06/06/16 13:02	06/06/16 23:58	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-17641-1

Client Sample ID: L11-06-23-P-R-Q-00

Lab Sample ID: 160-17641-18

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

Other Detected			Count	Total						
Radionuclides	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.384		0.0461	0.0607		0.0316	pCi/g	06/06/16 13:02	06/06/16 23:58	1

Client Sample ID: L11-06-23-P-R-Q-00

Lab Sample ID: 160-17641-18

Date Collected: 05/31/16 15:20

Matrix: Solid

Date Received: 06/03/16 11:10

Percent Solids: 77.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000068	0.000020	mg/Kg	☼	06/06/16 18:24	06/08/16 10:55	1

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

			Count	Total						
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.0374	U	0.146	0.146	1.37	0.234	pCi/g	06/06/16 18:24	06/08/16 10:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	96		30 - 110					06/06/16 18:24	06/08/16 10:55	1

QC Sample Results

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

TestAmerica Job ID: 160-17641-1

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

Lab Sample ID: MB 160-254966/1-A

Matrix: Solid

Analysis Batch: 255473

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 254966

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000053	0.000016	mg/Kg		06/06/16 18:24	06/08/16 08:59	1

Lab Sample ID: LCS 160-254966/2-A

Matrix: Solid

Analysis Batch: 255473

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 254966

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00119	0.00120		mg/Kg		101	80 - 120

Lab Sample ID: 160-17641-1 MS

Matrix: Solid

Analysis Batch: 255473

Client Sample ID: L11-06-01-P-S-S-00

Prep Type: Total/NA

Prep Batch: 254966

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	ND		0.00151	0.00154		mg/Kg	☼	102	75 - 125

Lab Sample ID: 160-17641-1 MSD

Matrix: Solid

Analysis Batch: 255473

Client Sample ID: L11-06-01-P-S-S-00

Prep Type: Total/NA

Prep Batch: 254966

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	ND		0.00151	0.00151		mg/Kg	☼	100	75 - 125	2	30

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

Lab Sample ID: MB 160-254966/1-A

Matrix: Solid

Analysis Batch: 255474

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 254966

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.01821	U	0.0256	0.0257	1.06	0.182	pCi/g	06/06/16 18:24	06/08/16 08:59	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	94		30 - 110	06/06/16 18:24	06/08/16 08:59	1

Lab Sample ID: LCS 160-254966/2-A

Matrix: Solid

Analysis Batch: 255474

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 254966

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	20.3	20.54		2.11	1.08	0.185	pCi/g	101	80 - 120

Carrier	LCS %Yield	LCS Qualifier	Limits
Re	92		30 - 110

TestAmerica St. Louis

QC Sample Results

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

TestAmerica Job ID: 160-17641-1

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

Lab Sample ID: 160-17641-1 MS

Matrix: Solid

Analysis Batch: 255474

Client Sample ID: L11-06-01-P-S-S-00

Prep Type: Total/NA

Prep Batch: 254966

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	0.111	U	25.8	26.33		2.75	1.58	0.270	pCi/g	102	75 - 125
Carrier	%Yield	MS Qualifier	Limits								
Re	81		30 - 110								

Lab Sample ID: 160-17641-1 MSD

Matrix: Solid

Analysis Batch: 255474

Client Sample ID: L11-06-01-P-S-S-00

Prep Type: Total/NA

Prep Batch: 254966

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	0.111	U	25.8	25.85		2.42	1.38	0.236	pCi/g	100	75 - 125	0.09	1
Carrier	%Yield	MSD Qualifier	Limits										
Re	92		30 - 110										

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

Lab Sample ID: MB 160-254924/1-A

Matrix: Solid

Analysis Batch: 254920

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 254924

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	-0.003074	U	0.0508	0.0508		0.0679	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Americium 241	0.003314	U	0.0257	0.0257		0.0439	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Bismuth 212	0.0000000	U	0.212	0.212		0.378	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Bismuth 214	-0.01731	U	0.0274	0.0274		0.0944	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Lead 212	-0.001906	U	0.0210	0.0210		0.0368	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Lead 214	-0.001108	U	0.0239	0.0239		0.0422	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Potassium 40	0.04750	U	0.152	0.152		0.267	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Protactinium 231	0.1266	U	0.293	0.293		0.688	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Radium 226	-0.01731	U	0.0274	0.0274	1.00	0.0944	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Thorium 234	-0.08328	U	0.251	0.251	1.00	0.438	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Uranium 235	0.005444	U	0.0149	0.0149		0.170	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Protactinium 234m	-0.1634	U	2.11	2.11		3.47	pCi/g	06/06/16 13:02	06/06/16 19:25	1
Thorium 232	-0.003074	U	0.0508	0.0508		0.0679	pCi/g	06/06/16 13:02	06/06/16 19:25	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	06/06/16 13:02	06/06/16 19:25	1

TestAmerica St. Louis

QC Sample Results

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

TestAmerica Job ID: 160-17641-1

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

Lab Sample ID: LCS 160-254924/2-A
Matrix: Solid
Analysis Batch: 254911

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 254924

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	101	102.7		10.7		0.619	pCi/g	102	87 - 116
Cesium 137	33.9	33.87		3.56	0.200	0.218	pCi/g	100	87 - 120
Cobalt 60	31.0	30.43		3.08		0.127	pCi/g	98	87 - 115

Lab Sample ID: 160-17641-1 DU
Matrix: Solid
Analysis Batch: 254918

Client Sample ID: L11-06-01-P-S-S-00
Prep Type: Total/NA
Prep Batch: 254924

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.10		0.8669		0.165		0.147	pCi/g	0.65	1
Americium 241	-0.0479	U	0.04437	U	0.0468		0.0761	pCi/g	0.60	1
Bismuth 212	0.311	U	1.255		0.613		0.520	pCi/g	0.82	1
Bismuth 214	1.06		0.9512		0.162		0.0896	pCi/g	0.33	1
Lead 212	0.958		0.9250		0.144		0.0707	pCi/g	0.11	1
Lead 214	1.10		0.9622		0.142		0.0777	pCi/g	0.47	1
Potassium 40	17.4		16.37		2.12		0.188	pCi/g	0.23	1
Protactinium 231	0.000	U	0.000000	U	1.55		2.62	pCi/g	0	1
Radium 226	1.06		0.9512		0.162	1.00	0.0896	pCi/g	0.33	1
Thorium 234	1.48		2.042		0.613	1.00	0.837	pCi/g	0.45	1
Uranium 235	-0.135	U	-0.02865	U	0.0445		0.655	pCi/g	0.30	1
Protactinium 234m	4.42	U	2.398	U	3.44		9.53	pCi/g	0.19	1
Thorium 232	1.10		0.8669		0.165		0.147	pCi/g	0.65	1
Other Detected Radionuclides	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Tl-208	0.301		0.2949		0.0588		0.0364	pCi/g	0.05	1

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-17641-1

Metals

Prep Batch: 254966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-1 MS	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-1 MSD	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	None	
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	None	
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	None	
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	None	
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	None	
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	None	
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	None	
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	None	
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	None	
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	None	
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	None	
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	None	
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	None	
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	None	
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	None	
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	None	
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	None	
LCS 160-254966/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-254966/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 255473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-1 MS	L11-06-01-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-1 MSD	L11-06-01-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	6020A	254966
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	6020A	254966
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	6020A	254966
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	6020A	254966
LCS 160-254966/2-A	Lab Control Sample	Total/NA	Solid	6020A	254966
MB 160-254966/1-A	Method Blank	Total/NA	Solid	6020A	254966

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-17641-1

General Chemistry

Analysis Batch: 254896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	Moisture	
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	Moisture	
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	Moisture	
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	Moisture	
160-17641-18 DU	L11-06-23-P-R-Q-00	Total/NA	Solid	Moisture	

Rad

Leach Batch: 254761

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-1 DU	L11-06-01-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	Dry and Grind	
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	Dry and Grind	

Prep Batch: 254924

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-1 DU	L11-06-01-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-17641-1

Rad (Continued)

Prep Batch: 254924 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	Fill_Geo-0	254761
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	Fill_Geo-0	254761
LCS 160-254924/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-254924/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

Prep Batch: 254966

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17641-1	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-1 MS	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-1 MSD	L11-06-01-P-S-S-00	Total/NA	Solid	None	
160-17641-2	L11-06-02-P-R-S-00	Total/NA	Solid	None	
160-17641-3	L11-06-04-P-S-S-00	Total/NA	Solid	None	
160-17641-4	L11-06-05-P-R-S-00	Total/NA	Solid	None	
160-17641-5	L11-06-07-P-S-S-00	Total/NA	Solid	None	
160-17641-6	L11-06-08-P-R-S-00	Total/NA	Solid	None	
160-17641-7	L11-06-10-P-S-S-00	Total/NA	Solid	None	
160-17641-8	L11-06-11-P-R-S-00	Total/NA	Solid	None	
160-17641-9	L11-06-13-P-S-S-00	Total/NA	Solid	None	
160-17641-10	L11-06-14-P-R-S-00	Total/NA	Solid	None	
160-17641-11	L11-06-16-P-S-S-00	Total/NA	Solid	None	
160-17641-12	L11-06-17-P-R-S-00	Total/NA	Solid	None	
160-17641-13	L11-06-17-P-R-Q-00	Total/NA	Solid	None	
160-17641-14	L11-06-19-P-S-S-00	Total/NA	Solid	None	
160-17641-15	L11-06-20-P-R-S-00	Total/NA	Solid	None	
160-17641-16	L11-06-22-P-S-S-00	Total/NA	Solid	None	
160-17641-17	L11-06-23-P-R-S-00	Total/NA	Solid	None	
160-17641-18	L11-06-23-P-R-Q-00	Total/NA	Solid	None	
LCS 160-254966/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-254966/1-A	Method Blank	Total/NA	Solid	None	

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-17641-1

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)
160-17641-1	L11-06-01-P-S-S-00	89
160-17641-1 MS	L11-06-01-P-S-S-00	81
160-17641-1 MSD	L11-06-01-P-S-S-00	92
160-17641-2	L11-06-02-P-R-S-00	92
160-17641-3	L11-06-04-P-S-S-00	92
160-17641-4	L11-06-05-P-R-S-00	92
160-17641-5	L11-06-07-P-S-S-00	91
160-17641-6	L11-06-08-P-R-S-00	91
160-17641-7	L11-06-10-P-S-S-00	92
160-17641-8	L11-06-11-P-R-S-00	94
160-17641-9	L11-06-13-P-S-S-00	94
160-17641-10	L11-06-14-P-R-S-00	95
160-17641-11	L11-06-16-P-S-S-00	92
160-17641-12	L11-06-17-P-R-S-00	94
160-17641-13	L11-06-17-P-R-Q-00	95
160-17641-14	L11-06-19-P-S-S-00	93
160-17641-15	L11-06-20-P-R-S-00	96
160-17641-16	L11-06-22-P-S-S-00	94
160-17641-17	L11-06-23-P-R-S-00	95
160-17641-18	L11-06-23-P-R-Q-00	96
LCS 160-254966/2-A	Lab Control Sample	92
MB 160-254966/1-A	Method Blank	94

Tracer/Carrier Legend

Re = Re