

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: 160-16856-1

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

For:

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

Attn: Mr. Martin Swanson



Authorized for release by:
4/14/2016 12:55:01 PM

Ivan Vania, Project Manager II
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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: 160-16856-1

Job ID: 160-16856-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-16856-1

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 4/11/2016 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 20.2° C and 20.2° C.

TECHNETIUM-99 (ICPMS)

Samples L08-14-01-T-R-S-00 (160-16856-1), L08-14-02-T-E-S-00 (160-16856-2), L08-14-03-T-R-S-00 (160-16856-3), L08-14-04-T-E-S-00 (160-16856-4), L08-14-05-T-R-S-00 (160-16856-5), L08-14-06-T-E-S-00 (160-16856-6), L08-14-07-T-E-S-00 (160-16856-7), L08-14-08-T-E-S-00 (160-16856-8), L08-14-09-T-R-S-00 (160-16856-9), L08-14-09-T-R-Q-00 (160-16856-10), L08-14-10-T-E-S-00 (160-16856-11), L08-14-11-T-E-S-00 (160-16856-12), L08-14-12-T-E-S-00 (160-16856-13), L08-14-13-T-E-S-00 (160-16856-14), L08-14-14-T-R-S-00 (160-16856-15), L08-14-15-T-E-S-00 (160-16856-16), L08-14-16-T-R-S-00 (160-16856-17) and L08-14-17-T-E-S-00 (160-16856-18) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 04/11/2016 and analyzed on 04/13/2016.

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: 160-16856-1

Job ID: 160-16856-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

PERCENT SOLIDS

Samples L08-14-01-T-R-S-00 (160-16856-1), L08-14-02-T-E-S-00 (160-16856-2), L08-14-03-T-R-S-00 (160-16856-3), L08-14-04-T-E-S-00 (160-16856-4), L08-14-05-T-R-S-00 (160-16856-5), L08-14-06-T-E-S-00 (160-16856-6), L08-14-07-T-E-S-00 (160-16856-7), L08-14-08-T-E-S-00 (160-16856-8), L08-14-09-T-R-S-00 (160-16856-9), L08-14-09-T-R-Q-00 (160-16856-10), L08-14-10-T-E-S-00 (160-16856-11), L08-14-11-T-E-S-00 (160-16856-12), L08-14-12-T-E-S-00 (160-16856-13), L08-14-13-T-E-S-00 (160-16856-14), L08-14-14-T-R-S-00 (160-16856-15), L08-14-15-T-E-S-00 (160-16856-16), L08-14-16-T-R-S-00 (160-16856-17) and L08-14-17-T-E-S-00 (160-16856-18) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 04/11/2016.

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

CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L08-14-01-T-R-S-00 (160-16856-1), L08-14-02-T-E-S-00 (160-16856-2), L08-14-03-T-R-S-00 (160-16856-3), L08-14-04-T-E-S-00 (160-16856-4), L08-14-05-T-R-S-00 (160-16856-5), L08-14-06-T-E-S-00 (160-16856-6), L08-14-07-T-E-S-00 (160-16856-7), L08-14-08-T-E-S-00 (160-16856-8), L08-14-09-T-R-S-00 (160-16856-9), L08-14-09-T-R-Q-00 (160-16856-10), L08-14-10-T-E-S-00 (160-16856-11), L08-14-11-T-E-S-00 (160-16856-12), L08-14-12-T-E-S-00 (160-16856-13), L08-14-13-T-E-S-00 (160-16856-14), L08-14-14-T-R-S-00 (160-16856-15), L08-14-15-T-E-S-00 (160-16856-16), L08-14-16-T-R-S-00 (160-16856-17) and L08-14-17-T-E-S-00 (160-16856-18) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 04/11/2016, and prepared and analyzed on 04/12/2016.

Preparation Batch 160-245328:

Radium-226 is reported in these samples at the client's request. Radium-226 is reported from the 609.31 keV line of bismuth-214. Because the samples have not had 21-days of ingrowth, the activity for radium-226 is an estimated value and may be biased low. This bias is caused by the disruption of secular equilibrium between radium-226 and bismuth-214 by the loss of radon-222 during sample preparation. The samples are reported with the MDC achieved. L08-14-01-T-R-S-00 (160-16856-1), L08-14-02-T-E-S-00 (160-16856-2), L08-14-03-T-R-S-00 (160-16856-3), L08-14-04-T-E-S-00 (160-16856-4), L08-14-05-T-R-S-00 (160-16856-5), L08-14-06-T-E-S-00 (160-16856-6), L08-14-07-T-E-S-00 (160-16856-7), L08-14-08-T-E-S-00 (160-16856-8), L08-14-09-T-R-S-00 (160-16856-9), L08-14-09-T-R-Q-00 (160-16856-10), L08-14-10-T-E-S-00 (160-16856-11), L08-14-11-T-E-S-00 (160-16856-12), L08-14-12-T-E-S-00 (160-16856-13), L08-14-13-T-E-S-00 (160-16856-14), L08-14-14-T-R-S-00 (160-16856-15), L08-14-15-T-E-S-00 (160-16856-16), L08-14-16-T-R-S-00 (160-16856-17), L08-14-17-T-E-S-00 (160-16856-18), (LCS 160-245328/2-A), (MB 160-245328/1-A) and (160-16856-A-18-E DU)

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

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-040916-01				Page 1 of 2				Requested Analysis												Laboratory Name:									
Project Name:				Westinghouse Electric Company				Contact Person:				Clark Evers				Phone Number:				314-810-3336				Sampler Name				Michael Dekeyser				TA-MO	
Sample ID				Date		Time		Matrix		Comp (C) or Grab (G)		Gamma Spec		Isotopic Uranium		Tc-99		Gamma Spec (21 day ingrow for Ra-226)										Total Containers		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					
L08-14-01-T-R-S-00				4/9/2016		9:05		S		C		X				X		X										1		LSA 08-14			
L08-14-02-T-E-S-00				4/9/2016		9:10		S		G		X				X		X										1		LSA 08-14			
L08-14-03-T-R-S-00				4/9/2016		9:20		S		C		X				X		X										1		LSA 08-14			
L08-14-04-T-E-S-00				4/9/2016		9:25		S		G		X				X		X										1		LSA 08-14			
L08-14-05-T-R-S-00				4/9/2016		9:30		S		C		X				X		X										1		LSA 08-14			
L08-14-06-T-E-S-00				4/9/2016		9:35		S		G		X				X		X										1		LSA 08-14			
L08-14-07-T-E-S-00				4/9/2016		9:40		S		G		X				X		X										1		LSA 08-14			
L08-14-08-T-E-S-00				4/9/2016		9:45		S		G		X				X		X										1		LSA 08-14			
L08-14-09-T-R-S-00				4/9/2016		9:50		S		C		X				X		X										1		LSA 08-14			
L08-14-09-T-R-Q-00				4/9/2016		9:50		S		C		X				X		X										1		LSA 08-14			
L08-14-10-T-E-S-00				4/9/2016		9:55		S		G		X				X		X										1		LSA 08-14			
L08-14-11-T-E-S-00				4/9/2016		10:00		S		G		X				X		X										1		LSA 08-14			
Relinquished by: C. Carson				Date/Time				Received by: [Signature]				Date/Time				Total				Cooler Temperature:													
Company Name: WEC				4-11-16 0910				Company Name: CRESRAD				4-11-16 0910				18				Ambient													
Received by:				Date/Time				Relinquished by:				Date/Time				Cooler ID: 0409-01/02				Shipper and Number:													
Company Name:								Company Name:																									
Relinquished by: [Signature]				Date/Time				Received by: [Signature]				Date/Time				Comments: N/A																	
Company Name: 3815				4-11-16 11:30				Company Name: TA 38				4-11-16 1130				Verified By: Thomas Yarr & [Signature]				4-11-16													

160-16856 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-040916-01 Page 2 of 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 Re-226)							Total Containers	TA-MO	
Contact Person: Clark Evers																Laboratory Address: 13715 Rider Trail North	
Phone Number: 314-810-3336																Phone No. 314-298-8566	
Sampler Name: Michael Dekeyser																Laboratory Contact Person: Ivan Vania	
																Phone No. 708-870-8453	
																Turn Around Time	
																Rush	
																(7 days)	
																Remarks	
Sample ID	Date	Time	Matrix														
L08-14-12-T-E-S-00	4/9/2016	10:05	S	G	X		X	X							1	LSA 08-14	
L08-14-13-T-E-S-00	4/9/2016	10:10	S	G	X		X	X							1	LSA 08-14	
L08-14-14-T-R-S-00	4/9/2016	10:15	S	C	X		X	X							1	LSA 08-14	
L08-14-15-T-E-S-00	4/9/2016	10:20	S	G	X		X	X							1	LSA 08-14	
L08-14-16-T-R-S-00	4/9/2016	13:00	S	C	X		X	X							1	LSA 08-14	
L08-14-17-T-E-S-00	4/9/2016	13:05	S	G	X		X	X							1	LSA 08-14	
Relinquished by: C. Carson Carpenter		Date/Time 4-11-16 0910		Received by: RGM CROSSROADS		Date/Time 4-11-16 0910		Total 18		Cooler Temperature: Ambient							
Company Name: WEC				Company Name: CROSSROADS				Cooler ID: 0409-01/02		Shipper and Number:							
Received by:		Date/Time		Relinquished by:		Date/Time		Comments: N/A									
Company Name:				Company Name:													
Relinquished by: RGM 3815		Date/Time 4-11-16 11:30		Received by: C. Clarke TA 5TL		Date/Time 4-11-16 1130		Verified By: Thomas Yord / [Signature]									
Company Name: CROSSROADS																	

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-16856-1

Login Number: 16856

List Source: TestAmerica St. Louis

List Number: 1

Creator: Dedner, Connie L

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

Definitions/Glossary

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

TestAmerica Job ID: 160-16856-1

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: 160-16856-1

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: 160-16856-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-16856-1	L08-14-01-T-R-S-00	Solid	04/09/16 09:05	04/11/16 11:30
160-16856-2	L08-14-02-T-E-S-00	Solid	04/09/16 09:10	04/11/16 11:30
160-16856-3	L08-14-03-T-R-S-00	Solid	04/09/16 09:20	04/11/16 11:30
160-16856-4	L08-14-04-T-E-S-00	Solid	04/09/16 09:25	04/11/16 11:30
160-16856-5	L08-14-05-T-R-S-00	Solid	04/09/16 09:30	04/11/16 11:30
160-16856-6	L08-14-06-T-E-S-00	Solid	04/09/16 09:35	04/11/16 11:30
160-16856-7	L08-14-07-T-E-S-00	Solid	04/09/16 09:40	04/11/16 11:30
160-16856-8	L08-14-08-T-E-S-00	Solid	04/09/16 09:45	04/11/16 11:30
160-16856-9	L08-14-09-T-R-S-00	Solid	04/09/16 09:50	04/11/16 11:30
160-16856-10	L08-14-09-T-R-Q-00	Solid	04/09/16 09:50	04/11/16 11:30
160-16856-11	L08-14-10-T-E-S-00	Solid	04/09/16 09:55	04/11/16 11:30
160-16856-12	L08-14-11-T-E-S-00	Solid	04/09/16 10:00	04/11/16 11:30
160-16856-13	L08-14-12-T-E-S-00	Solid	04/09/16 10:05	04/11/16 11:30
160-16856-14	L08-14-13-T-E-S-00	Solid	04/09/16 10:10	04/11/16 11:30
160-16856-15	L08-14-14-T-R-S-00	Solid	04/09/16 10:15	04/11/16 11:30
160-16856-16	L08-14-15-T-E-S-00	Solid	04/09/16 10:20	04/11/16 11:30
160-16856-17	L08-14-16-T-R-S-00	Solid	04/09/16 13:00	04/11/16 11:30
160-16856-18	L08-14-17-T-E-S-00	Solid	04/09/16 13:05	04/11/16 11:30

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-01-T-R-S-00

Date Collected: 04/09/16 09:05

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-1

Matrix: Solid

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.903		0.0941	0.132		0.0717	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Americium 241	0.0427	U	0.0422	0.0424		0.0690	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Bismuth 212	1.16		0.344	0.364		0.293	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Bismuth 214	0.656		0.0722	0.0993		0.0482	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Lead 212	0.903		0.0623	0.132		0.0471	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Lead 214	0.703		0.0769	0.106		0.0583	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Potassium 40	15.6		0.920	1.85		0.233	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Protactinium 231	0.489	U	0.238	0.244		0.904	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Radium 226	0.656		0.0722	0.0993	1.00	0.0482	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Thorium 234	0.904		0.268	0.284	1.00	0.747	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Uranium 235	0.281		0.130	0.133		0.160	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Protactinium 234m	3.17		1.85	1.88		2.22	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Thorium 232	0.903		0.0941	0.132		0.0717	pCi/g	04/12/16 07:30	04/12/16 19:55	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.332		0.0378	0.0511		0.0251	pCi/g	04/12/16 07:30	04/12/16 19:55	1

Client Sample ID: L08-14-01-T-R-S-00

Date Collected: 04/09/16 09:05

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-1

Matrix: Solid

Percent Solids: 82.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00016		0.000068	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 16:05	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	2.74		0.228	0.340	1.35	0.232	pCi/g	04/11/16 14:11	04/13/16 16:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					04/11/16 14:11	04/13/16 16:05	1

Client Sample ID: L08-14-02-T-E-S-00

Date Collected: 04/09/16 09:10

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-2

Matrix: Solid

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.09		0.138	0.177		0.109	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Americium 241	-0.0256	U	0.0714	0.0714		0.119	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Bismuth 212	1.33		0.426	0.448		0.400	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Bismuth 214	0.820		0.123	0.149		0.0897	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Lead 212	1.04		0.0947	0.165		0.0816	pCi/g	04/12/16 07:30	04/12/16 20:44	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-02-T-E-S-00

Lab Sample ID: 160-16856-2

Date Collected: 04/09/16 09:10

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 214	0.940		0.0957	0.137		0.0717	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Potassium 40	18.8		1.38	2.37		0.252	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Protactinium 231	-0.786	U	0.949	0.953		1.56	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Radium 226	0.820		0.123	0.149	1.00	0.0897	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Thorium 234	1.14		0.331	0.352	1.00	0.905	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Uranium 235	0.191	U	0.153	0.154		0.245	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Protactinium 234m	0.920	U	3.55	3.55		5.98	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Thorium 232	1.09		0.138	0.177		0.109	pCi/g	04/12/16 07:30	04/12/16 20:44	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.415		0.0599	0.0738		0.0390	pCi/g	04/12/16 07:30	04/12/16 20:44	1

Client Sample ID: L08-14-02-T-E-S-00

Lab Sample ID: 160-16856-2

Date Collected: 04/09/16 09:10

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000091		0.000069	0.000021	mg/Kg	☼	04/11/16 14:11	04/13/16 16:18	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	1.56		0.216	0.259	1.38	0.237	pCi/g	04/11/16 14:11	04/13/16 16:18	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	88		30 - 110					04/11/16 14:11	04/13/16 16:18	1

Client Sample ID: L08-14-03-T-R-S-00

Lab Sample ID: 160-16856-3

Date Collected: 04/09/16 09:20

Matrix: Solid

Date Received: 04/11/16 11:30

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	0.998		0.112	0.151		0.108	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Americium 241	0.00762	U	0.0561	0.0562		0.0943	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Bismuth 212	1.25		0.367	0.390		0.304	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Bismuth 214	0.638		0.0792	0.103		0.0597	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Lead 212	0.931		0.0671	0.138		0.0550	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Lead 214	0.858		0.0713	0.114		0.0510	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Potassium 40	17.1		0.988	2.01		0.299	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Protactinium 231	0.494	U	0.237	0.243		0.914	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Radium 226	0.638		0.0792	0.103	1.00	0.0597	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Thorium 234	0.828		0.260	0.274	1.00	0.708	pCi/g	04/12/16 07:30	04/12/16 20:48	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-03-T-R-S-00

Lab Sample ID: 160-16856-3

Date Collected: 04/09/16 09:20

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 235	0.239		0.0998	0.103		0.150	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Protactinium 234m	-0.511	U	11.8	11.8		4.42	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Thorium 232	0.998		0.112	0.151		0.108	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Other Detected			Count	Total						
Radionuclides	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.307		0.0395	0.0508		0.0286	pCi/g	04/12/16 07:30	04/12/16 20:48	1

Client Sample ID: L08-14-03-T-R-S-00

Lab Sample ID: 160-16856-3

Date Collected: 04/09/16 09:20

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 84.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00063		0.000065	0.000019	mg/Kg	☼	04/11/16 14:11	04/13/16 16:22	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	10.8		0.868	1.32	1.30	0.222	pCi/g	04/11/16 14:11	04/13/16 16:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	89		30 - 110					04/11/16 14:11	04/13/16 16:22	1

Client Sample ID: L08-14-04-T-E-S-00

Lab Sample ID: 160-16856-4

Date Collected: 04/09/16 09:25

Matrix: Solid

Date Received: 04/11/16 11:30

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		0.117	0.157		0.0840	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Americium 241	-0.00338	U	0.0562	0.0562		0.0951	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Bismuth 212	1.06		0.361	0.377		0.349	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Bismuth 214	0.808		0.0954	0.127		0.0630	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Lead 212	0.992		0.0808	0.152		0.0681	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Lead 214	0.817		0.0862	0.121		0.0722	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Potassium 40	18.4		1.21	2.24		0.229	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Protactinium 231	0.551	U	0.251	0.258		1.02	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Radium 226	0.808		0.0954	0.127	1.00	0.0630	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Thorium 234	0.956		0.271	0.288	1.00	0.760	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Uranium 235	0.0976	U	0.125	0.125		0.221	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Protactinium 234m	-0.0542	U	3.28	3.28		5.87	pCi/g	04/12/16 07:30	04/12/16 20:48	1
Thorium 232	1.02		0.117	0.157		0.0840	pCi/g	04/12/16 07:30	04/12/16 20:48	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-04-T-E-S-00

Lab Sample ID: 160-16856-4

Date Collected: 04/09/16 09:25

Matrix: Solid

Date Received: 04/11/16 11:30

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.353		0.0429	0.0564		0.0256	pCi/g	04/12/16 07:30	04/12/16 20:48	1

Client Sample ID: L08-14-04-T-E-S-00

Lab Sample ID: 160-16856-4

Date Collected: 04/09/16 09:25

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00035		0.000068	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 16:27	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	5.97		0.321	0.637	1.36	0.232	pCi/g	04/11/16 14:11	04/13/16 16:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	92		30 - 110					04/11/16 14:11	04/13/16 16:27	1

Client Sample ID: L08-14-05-T-R-S-00

Lab Sample ID: 160-16856-5

Date Collected: 04/09/16 09:30

Matrix: Solid

Date Received: 04/11/16 11:30

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	1.07		0.120	0.162		0.120	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Americium 241	0.0304	U	0.0564	0.0564		0.0940	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Bismuth 212	1.52		0.454	0.480		0.386	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Bismuth 214	0.838		0.0790	0.117		0.0611	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Lead 212	1.07		0.0803	0.161		0.0675	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Lead 214	0.921		0.0808	0.125		0.0642	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Potassium 40	21.0		1.09	2.38		0.252	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Protactinium 231	0.397	U	0.195	0.200		1.10	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Radium 226	0.838		0.0790	0.117	1.00	0.0611	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Thorium 234	0.824		0.249	0.264	1.00	0.674	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Uranium 235	0.0547	U	0.0895	0.0897		0.229	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Protactinium 234m	2.34	U	2.81	2.82		4.60	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Thorium 232	1.07		0.120	0.162		0.120	pCi/g	04/12/16 07:30	04/12/16 20:49	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.331		0.0395	0.0522		0.0313	pCi/g	04/12/16 07:30	04/12/16 20:49	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-05-T-R-S-00

Lab Sample ID: 160-16856-5

Date Collected: 04/09/16 09:30

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 80.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00020		0.000070	0.000021	mg/Kg	☼	04/11/16 14:11	04/13/16 16:31	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	3.37		0.200	0.369	1.40	0.239	pCi/g	04/11/16 14:11	04/13/16 16:31	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	88		30 - 110	04/11/16 14:11	04/13/16 16:31	1

Client Sample ID: L08-14-06-T-E-S-00

Lab Sample ID: 160-16856-6

Date Collected: 04/09/16 09:35

Matrix: Solid

Date Received: 04/11/16 11:30

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	0.978		0.104	0.144		0.0958	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Americium 241	0.00818	U	0.0565	0.0565		0.0950	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Bismuth 212	1.36		0.393	0.417		0.348	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Bismuth 214	0.706		0.0907	0.117		0.0683	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Lead 212	1.04		0.0671	0.150		0.0548	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Lead 214	0.831		0.0762	0.115		0.0604	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Potassium 40	19.6		1.10	2.29		0.277	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Protactinium 231	-0.526	U	0.578	0.581		0.948	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Radium 226	0.706		0.0907	0.117	1.00	0.0683	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Thorium 234	1.24		0.434	0.453	1.00	0.674	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Uranium 235	0.0782	U	0.122	0.122		0.200	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Protactinium 234m	4.17	U	2.46	2.49		4.74	pCi/g	04/12/16 07:30	04/12/16 20:50	1
Thorium 232	0.978		0.104	0.144		0.0958	pCi/g	04/12/16 07:30	04/12/16 20:50	1

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.308		0.0412	0.0522		0.0314	pCi/g	04/12/16 07:30	04/12/16 20:50	1

Client Sample ID: L08-14-06-T-E-S-00

Lab Sample ID: 160-16856-6

Date Collected: 04/09/16 09:35

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00024		0.000070	0.000021	mg/Kg	☼	04/11/16 14:11	04/13/16 16:35	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	4.16		0.200	0.432	1.40	0.240	pCi/g	04/11/16 14:11	04/13/16 16:35	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-06-T-E-S-00

Date Collected: 04/09/16 09:35

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-6

Matrix: Solid

Percent Solids: 81.0

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	88		30 - 110	04/11/16 14:11	04/13/16 16:35	1

Client Sample ID: L08-14-07-T-E-S-00

Date Collected: 04/09/16 09:40

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-7

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	1.01		0.179	0.207		0.123	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Americium 241	0.000855	U	0.0698	0.0698		0.118	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Bismuth 212	1.48		0.428	0.455		0.374	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Bismuth 214	0.687		0.101	0.124		0.0660	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Lead 212	0.999		0.0868	0.156		0.0720	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Lead 214	0.833		0.0884	0.124		0.0928	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Potassium 40	19.0		1.38	2.38		0.249	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Protactinium 231	0.00995	U	5.75	5.75		1.04	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Radium 226	0.687		0.101	0.124	1.00	0.0660	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Thorium 234	1.29		0.330	0.357	1.00	0.929	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Uranium 235	0.490		0.182	0.188		0.239	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Protactinium 234m	2.64	U	3.80	3.81		6.81	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Thorium 232	1.01		0.179	0.207		0.123	pCi/g	04/12/16 07:30	04/12/16 21:27	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.319		0.0590	0.0676		0.0446	pCi/g	04/12/16 07:30	04/12/16 21:27	1

Client Sample ID: L08-14-07-T-E-S-00

Date Collected: 04/09/16 09:40

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-7

Matrix: Solid

Percent Solids: 84.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00040		0.000064	0.000019	mg/Kg	☼	04/11/16 14:11	04/13/16 16:52	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	6.84		0.376	0.733	1.28	0.220	pCi/g	04/11/16 14:11	04/13/16 16:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	91		30 - 110					04/11/16 14:11	04/13/16 16:52	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-08-T-E-S-00

Lab Sample ID: 160-16856-8

Date Collected: 04/09/16 09:45

Matrix: Solid

Date Received: 04/11/16 11:30

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	0.998		0.110	0.150		0.0828	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Americium 241	0.0180	U	0.0555	0.0555		0.0928	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Bismuth 212	1.41		0.353	0.382		0.291	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Bismuth 214	0.746		0.0825	0.113		0.0577	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Lead 212	0.958		0.0723	0.143		0.0612	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Lead 214	0.778		0.0715	0.108		0.0529	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Potassium 40	17.8		1.03	2.09		0.331	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Protactinium 231	0.348	U	0.205	0.208		0.921	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Radium 226	0.746		0.0825	0.113	1.00	0.0577	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Thorium 234	0.708	U	0.252	0.263	1.00	0.759	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Uranium 235	0.0297	U	0.127	0.127		0.228	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Protactinium 234m	2.79	U	1.82	1.84		4.49	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Thorium 232	0.998		0.110	0.150		0.0828	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
Tl-208	0.314		0.0423	0.0534		0.0318	pCi/g	04/12/16 07:30	04/12/16 21:28	1

Client Sample ID: L08-14-08-T-E-S-00

Lab Sample ID: 160-16856-8

Date Collected: 04/09/16 09:45

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 84.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00043		0.000064	0.000019	mg/Kg	☼	04/11/16 14:11	04/13/16 16:57	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	7.28		0.651	0.934	1.28	0.219	pCi/g	04/11/16 14:11	04/13/16 16:57	1
Carrier	%Yield	Qualifier	Limits							
Re	92		30 - 110							
								Prepared	Analyzed	Dil Fac
								04/11/16 14:11	04/13/16 16:57	1

Client Sample ID: L08-14-09-T-R-S-00

Lab Sample ID: 160-16856-9

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

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		0.118	0.159		0.118	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Americium 241	0.0322	U	0.0524	0.0525		0.0870	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Bismuth 212	1.74		0.409	0.447		0.310	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Bismuth 214	0.794		0.108	0.136		0.0781	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Lead 212	0.983		0.0805	0.151		0.0681	pCi/g	04/12/16 07:30	04/12/16 21:28	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-09-T-R-S-00

Lab Sample ID: 160-16856-9

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 214	0.835		0.0880	0.124		0.0796	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Potassium 40	17.6		1.20	2.17		0.329	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Protactinium 231	0.605	U	0.355	0.361		0.949	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Radium 226	0.794		0.108	0.136	1.00	0.0781	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Thorium 234	1.26		0.496	0.513	1.00	0.772	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Uranium 235	0.0894	U	0.134	0.135		0.243	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Protactinium 234m	2.41	U	2.97	2.98		4.87	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Thorium 232	1.05		0.118	0.159		0.118	pCi/g	04/12/16 07:30	04/12/16 21:28	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.347		0.0533	0.0644		0.0407	pCi/g	04/12/16 07:30	04/12/16 21:28	1

Client Sample ID: L08-14-09-T-R-S-00

Lab Sample ID: 160-16856-9

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00014		0.000068	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:01	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	2.36		0.271	0.348	1.35	0.232	pCi/g	04/11/16 14:11	04/13/16 17:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	89		30 - 110					04/11/16 14:11	04/13/16 17:01	1

Client Sample ID: L08-14-09-T-R-Q-00

Lab Sample ID: 160-16856-10

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

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		0.124	0.171		0.0914	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Americium 241	-0.0216	U	0.154	0.154		0.101	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Bismuth 212	1.24		0.372	0.393		0.357	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Bismuth 214	0.845		0.101	0.133		0.0710	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Lead 212	1.17		0.0890	0.176		0.0757	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Lead 214	0.987		0.101	0.144		0.0797	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Potassium 40	21.4		1.15	2.44		0.357	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Protactinium 231	-0.697	U	0.710	0.714		1.16	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Radium 226	0.845		0.101	0.133	1.00	0.0710	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Thorium 234	1.08		0.501	0.514	1.00	0.803	pCi/g	04/12/16 07:30	04/12/16 21:29	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-09-T-R-Q-00

Lab Sample ID: 160-16856-10

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 235	0.0909	U	0.147	0.147		0.241	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Protactinium 234m	4.65		2.86	2.90		4.55	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Thorium 232	1.17		0.124	0.171		0.0914	pCi/g	04/12/16 07:30	04/12/16 21:29	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.333		0.0445	0.0562		0.0365	pCi/g	04/12/16 07:30	04/12/16 21:29	1

Client Sample ID: L08-14-09-T-R-Q-00

Lab Sample ID: 160-16856-10

Date Collected: 04/09/16 09:50

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00010		0.000066	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:05	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	1.71		0.186	0.243	1.32	0.226	pCi/g	04/11/16 14:11	04/13/16 17:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	91		30 - 110					04/11/16 14:11	04/13/16 17:05	1

Client Sample ID: L08-14-10-T-E-S-00

Lab Sample ID: 160-16856-11

Date Collected: 04/09/16 09:55

Matrix: Solid

Date Received: 04/11/16 11:30

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		0.117	0.160		0.110	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Americium 241	-0.0109	U	0.0525	0.0525		0.0884	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Bismuth 212	1.20		0.306	0.331		0.253	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Bismuth 214	0.696		0.0935	0.118		0.0704	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Lead 212	1.02		0.0749	0.151		0.0554	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Lead 214	0.842		0.0763	0.116		0.0778	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Potassium 40	16.8		1.09	2.04		0.345	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Protactinium 231	0.524	U	0.226	0.233		0.931	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Radium 226	0.696		0.0935	0.118	1.00	0.0704	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Thorium 234	1.36		0.496	0.516	1.00	0.774	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Uranium 235	0.104	U	0.112	0.112		0.211	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Protactinium 234m	-0.330	U	13.2	13.2		7.00	pCi/g	04/12/16 07:30	04/12/16 21:30	1
Thorium 232	1.06		0.117	0.160		0.110	pCi/g	04/12/16 07:30	04/12/16 21:30	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-10-T-E-S-00

Lab Sample ID: 160-16856-11

Date Collected: 04/09/16 09:55

Matrix: Solid

Date Received: 04/11/16 11:30

Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.323		0.0407	0.0527		0.0269	pCi/g	04/12/16 07:30	04/12/16 21:30	1

Client Sample ID: L08-14-10-T-E-S-00

Lab Sample ID: 160-16856-11

Date Collected: 04/09/16 09:55

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.2

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00011		0.000066	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:10	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	1.92		0.121	0.214	1.32	0.226	pCi/g	04/11/16 14:11	04/13/16 17:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	93		30 - 110					04/11/16 14:11	04/13/16 17:10	1

Client Sample ID: L08-14-11-T-E-S-00

Lab Sample ID: 160-16856-12

Date Collected: 04/09/16 10:00

Matrix: Solid

Date Received: 04/11/16 11:30

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	1.11		0.141	0.181		0.144	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Americium 241	0.0222	U	0.0714	0.0715		0.120	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Bismuth 212	1.67		0.598	0.622		0.546	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Bismuth 214	0.822		0.113	0.142		0.0763	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Lead 212	1.00		0.108	0.169		0.0980	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Lead 214	0.944		0.113	0.150		0.0870	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Potassium 40	19.6		1.40	2.44		0.248	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Protactinium 231	-0.680	U	0.875	0.878		1.44	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Radium 226	0.822		0.113	0.142	1.00	0.0763	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Thorium 234	1.02		0.304	0.323	1.00	0.842	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Uranium 235	0.181	U	0.162	0.163		0.273	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Protactinium 234m	0.571	U	2.74	2.74		7.19	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Thorium 232	1.11		0.141	0.181		0.144	pCi/g	04/12/16 07:30	04/12/16 22:04	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.401		0.0604	0.0734		0.0427	pCi/g	04/12/16 07:30	04/12/16 22:04	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-11-T-E-S-00

Lab Sample ID: 160-16856-12

Date Collected: 04/09/16 10:00

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 80.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000026	J	0.000066	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:14	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.449		0.0158	0.0443	1.32	0.226	pCi/g	04/11/16 14:11	04/13/16 17:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	95		30 - 110					04/11/16 14:11	04/13/16 17:14	1

Client Sample ID: L08-14-12-T-E-S-00

Lab Sample ID: 160-16856-13

Date Collected: 04/09/16 10:05

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.03		0.131	0.168		0.0679	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Americium 241	0.0236	U	0.0551	0.0552		0.0918	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Bismuth 212	1.04		0.386	0.401		0.358	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Bismuth 214	0.672		0.0723	0.101		0.0512	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Lead 212	0.929		0.0676	0.138		0.0554	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Lead 214	0.763		0.0640	0.102		0.0634	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Potassium 40	17.6		0.997	2.06		0.340	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Protactinium 231	0.319	U	0.183	0.186		0.926	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Radium 226	0.672		0.0723	0.101	1.00	0.0512	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Thorium 234	0.915		0.254	0.271	1.00	0.725	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Uranium 235	0.209		0.133	0.135		0.169	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Protactinium 234m	-0.329	U	13.2	13.2		4.94	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Thorium 232	1.03		0.131	0.168		0.0679	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.272		0.0358	0.0456		0.0285	pCi/g	04/12/16 07:30	04/12/16 22:06	1

Client Sample ID: L08-14-12-T-E-S-00

Lab Sample ID: 160-16856-13

Date Collected: 04/09/16 10:05

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.6

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00015		0.000066	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:18	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	2.60		0.201	0.312	1.32	0.225	pCi/g	04/11/16 14:11	04/13/16 17:18	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-12-T-E-S-00

Date Collected: 04/09/16 10:05

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-13

Matrix: Solid

Percent Solids: 81.6

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	93		30 - 110	04/11/16 14:11	04/13/16 17:18	1

Client Sample ID: L08-14-13-T-E-S-00

Date Collected: 04/09/16 10:10

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-14

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	1.03		0.158	0.190		0.132	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Americium 241	0.00337	U	0.0494	0.0494		0.0839	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Bismuth 212	1.39		0.360	0.388		0.287	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Bismuth 214	0.787		0.0942	0.125		0.0628	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Lead 212	1.02		0.0799	0.154		0.0658	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Lead 214	0.875		0.0847	0.124		0.0712	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Potassium 40	18.9		1.21	2.28		0.224	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Protactinium 231	0.755	U	0.309	0.320		1.07	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Radium 226	0.787		0.0942	0.125	1.00	0.0628	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Thorium 234	0.884		0.302	0.316	1.00	0.819	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Uranium 235	0.167	U	0.148	0.149		0.226	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Protactinium 234m	-0.243	U	0.445	0.445		5.31	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Thorium 232	1.03		0.158	0.190		0.132	pCi/g	04/12/16 07:30	04/12/16 22:06	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.328		0.0500	0.0605		0.0378	pCi/g	04/12/16 07:30	04/12/16 22:06	1

Client Sample ID: L08-14-13-T-E-S-00

Date Collected: 04/09/16 10:10

Date Received: 04/11/16 11:30

Lab Sample ID: 160-16856-14

Matrix: Solid

Percent Solids: 81.4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.00034		0.000064	0.000019	mg/Kg	☼	04/11/16 14:11	04/13/16 17:23	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	5.86		0.279	0.607	1.28	0.220	pCi/g	04/11/16 14:11	04/13/16 17:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	94		30 - 110					04/11/16 14:11	04/13/16 17:23	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-14-T-R-S-00

Lab Sample ID: 160-16856-15

Date Collected: 04/09/16 10:15

Matrix: Solid

Date Received: 04/11/16 11:30

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	0.739		0.0964	0.122		0.0718	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Americium 241	0.0246	U	0.0449	0.0450		0.0752	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Bismuth 212	1.06		0.301	0.320		0.249	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Bismuth 214	0.599		0.0669	0.0910		0.0400	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Lead 212	0.656		0.0600	0.104		0.0531	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Lead 214	0.591		0.0607	0.0866		0.0553	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Potassium 40	14.7		0.894	1.73		0.242	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Protactinium 231	0.259	U	0.149	0.152		0.923	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Radium 226	0.599		0.0669	0.0910	1.00	0.0400	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Thorium 234	0.980		0.377	0.390	1.00	0.590	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Uranium 235	0.0683	U	0.121	0.121		0.188	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Protactinium 234m	4.57		1.83	1.88		4.10	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Thorium 232	0.739		0.0964	0.122		0.0718	pCi/g	04/12/16 07:30	04/12/16 22:07	1
Other Detected			Count	Total						
Radionuclides			Uncert.	Uncert.						
Tl-208	0.223		0.0358	0.0425		0.0290	pCi/g	04/12/16 07:30	04/12/16 22:07	1

Client Sample ID: L08-14-14-T-R-S-00

Lab Sample ID: 160-16856-15

Date Collected: 04/09/16 10:15

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 85.7

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000046	J	0.000059	0.000018	mg/Kg	☼	04/11/16 14:11	04/13/16 17:27	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	0.794		0.0872	0.114	1.19	0.203	pCi/g	04/11/16 14:11	04/13/16 17:27	1
Carrier	%Yield	Qualifier	Limits							
Re	97		30 - 110							
								Prepared	Analyzed	Dil Fac
								04/11/16 14:11	04/13/16 17:27	1

Client Sample ID: L08-14-15-T-E-S-00

Lab Sample ID: 160-16856-16

Date Collected: 04/09/16 10:20

Matrix: Solid

Date Received: 04/11/16 11:30

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		0.113	0.157		0.0854	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Americium 241	-0.00909	U	0.0541	0.0541		0.0909	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Bismuth 212	1.16		0.408	0.425		0.372	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Bismuth 214	0.641		0.0722	0.0983		0.0620	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Lead 212	0.992		0.0782	0.150		0.0649	pCi/g	04/12/16 07:30	04/12/16 22:08	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-15-T-E-S-00

Lab Sample ID: 160-16856-16

Date Collected: 04/09/16 10:20

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead 214	0.776		0.0713	0.108		0.0650	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Potassium 40	18.8		1.08	2.21		0.324	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Protactinium 231	0.454	U	0.232	0.237		0.954	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Radium 226	0.641		0.0722	0.0983	1.00	0.0620	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Thorium 234	0.605	U	0.248	0.256	1.00	0.706	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Uranium 235	0.109	U	0.114	0.115		0.201	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Protactinium 234m	2.92	U	1.85	1.87		4.38	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Thorium 232	1.06		0.113	0.157		0.0854	pCi/g	04/12/16 07:30	04/12/16 22:08	1
Other Detected Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.306		0.0424	0.0529		0.0327	pCi/g	04/12/16 07:30	04/12/16 22:08	1

Client Sample ID: L08-14-15-T-E-S-00

Lab Sample ID: 160-16856-16

Date Collected: 04/09/16 10:20

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 82.1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000039	J	0.000067	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:31	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	0.666		0.0897	0.109	1.33	0.228	pCi/g	04/11/16 14:11	04/13/16 17:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	91		30 - 110					04/11/16 14:11	04/13/16 17:31	1

Client Sample ID: L08-14-16-T-R-S-00

Lab Sample ID: 160-16856-17

Date Collected: 04/09/16 13:00

Matrix: Solid

Date Received: 04/11/16 11:30

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	0.742		0.127	0.148		0.0884	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Americium 241	0.00989	U	0.0573	0.0573		0.0966	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Bismuth 212	1.26		0.287	0.315		0.120	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Bismuth 214	0.667		0.0936	0.116		0.0557	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Lead 212	0.714		0.0775	0.121		0.0712	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Lead 214	0.678		0.0843	0.110		0.0623	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Potassium 40	12.8		1.06	1.69		0.220	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Protactinium 231	0.214	U	0.238	0.239		1.11	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Radium 226	0.667		0.0936	0.116	1.00	0.0557	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Thorium 234	0.717		0.272	0.282	1.00	0.703	pCi/g	04/12/16 07:30	04/12/16 22:45	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-16-T-R-S-00

Lab Sample ID: 160-16856-17

Date Collected: 04/09/16 13:00

Matrix: Solid

Date Received: 04/11/16 11:30

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 235	0.127	U	0.143	0.143		0.215	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Protactinium 234m	1.00	U	3.19	3.19		5.59	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Thorium 232	0.742		0.127	0.148		0.0884	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Other Detected										
Radionuclides	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Tl-208	0.279		0.0421	0.0511		0.0281	pCi/g	04/12/16 07:30	04/12/16 22:45	1

Client Sample ID: L08-14-16-T-R-S-00

Lab Sample ID: 160-16856-17

Date Collected: 04/09/16 13:00

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 81.8

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000071		0.000063	0.000019	mg/Kg	☼	04/11/16 14:11	04/13/16 17:48	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	1.22		0.0310	0.116	1.26	0.215	pCi/g	04/11/16 14:11	04/13/16 17:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	96		30 - 110					04/11/16 14:11	04/13/16 17:48	1

Client Sample ID: L08-14-17-T-E-S-00

Lab Sample ID: 160-16856-18

Date Collected: 04/09/16 13:05

Matrix: Solid

Date Received: 04/11/16 11:30

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	1.04		0.0976	0.144		0.0883	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Americium 241	0.0179	U	0.0563	0.0563		0.0940	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Bismuth 212	1.36		0.338	0.366		0.305	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Bismuth 214	0.700		0.0889	0.115		0.0634	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Lead 212	0.907		0.0756	0.140		0.0647	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Lead 214	0.785		0.0656	0.105		0.0585	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Potassium 40	17.3		0.995	2.03		0.320	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Protactinium 231	0.460	U	0.267	0.271		0.869	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Radium 226	0.700		0.0889	0.115	1.00	0.0634	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Thorium 234	1.21		0.458	0.475	1.00	0.718	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Uranium 235	0.107	U	0.158	0.158		0.218	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Protactinium 234m	-0.338	U	13.5	13.5		6.51	pCi/g	04/12/16 07:30	04/12/16 22:45	1
Thorium 232	1.04		0.0976	0.144		0.0883	pCi/g	04/12/16 07:30	04/12/16 22:45	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-16856-1

Client Sample ID: L08-14-17-T-E-S-00

Lab Sample ID: 160-16856-18

Date Collected: 04/09/16 13:05

Matrix: Solid

Date Received: 04/11/16 11:30

Other Detected			Count	Total						
Radionuclides	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Ti-208	0.303		0.0443	0.0543		0.0341	pCi/g	04/12/16 07:30	04/12/16 22:45	1

Client Sample ID: L08-14-17-T-E-S-00

Lab Sample ID: 160-16856-18

Date Collected: 04/09/16 13:05

Matrix: Solid

Date Received: 04/11/16 11:30

Percent Solids: 80.0

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.000064	J	0.000066	0.000020	mg/Kg	☼	04/11/16 14:11	04/13/16 17:53	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	1.10		0.0242	0.104	1.33	0.228	pCi/g	04/11/16 14:11	04/13/16 17:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	94		30 - 110					04/11/16 14:11	04/13/16 17:53	1

QC Sample Results

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

TestAmerica Job ID: 160-16856-1

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

Lab Sample ID: MB 160-245279/1-A
Matrix: Solid
Analysis Batch: 245740

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245279

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000055	0.000016	mg/Kg		04/11/16 14:11	04/13/16 15:56	1

Lab Sample ID: LCS 160-245279/2-A
Matrix: Solid
Analysis Batch: 245740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245279

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00118	0.00123		mg/Kg		104	80 - 120

Lab Sample ID: 160-16856-1 MS
Matrix: Solid
Analysis Batch: 245740

Client Sample ID: L08-14-01-T-R-S-00
Prep Type: Total/NA
Prep Batch: 245279

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Technetium 99	0.00016		0.00143	0.00164		mg/Kg	☼	104	75 - 125

Lab Sample ID: 160-16856-1 MSD
Matrix: Solid
Analysis Batch: 245740

Client Sample ID: L08-14-01-T-R-S-00
Prep Type: Total/NA
Prep Batch: 245279

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technetium 99	0.00016		0.00144	0.00166		mg/Kg	☼	104	75 - 125	1	30

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

Lab Sample ID: MB 160-245279/1-A
Matrix: Solid
Analysis Batch: 245741

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245279

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	0.02620	U	0.0314	0.0315	1.09	0.187	pCi/g	04/11/16 14:11	04/13/16 15:56	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	91		30 - 110	04/11/16 14:11	04/13/16 15:56	1

Lab Sample ID: LCS 160-245279/2-A
Matrix: Solid
Analysis Batch: 245741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245279

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	20.2	21.08		2.00	1.09	0.187	pCi/g	104	80 - 120

Carrier	LCS %Yield	LCS Qualifier	Limits
Re	91		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: 160-16856-1

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

Lab Sample ID: 160-16856-1 MS

Matrix: Solid

Analysis Batch: 245741

Client Sample ID: L08-14-01-T-R-S-00

Prep Type: Total/NA

Prep Batch: 245279

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Technetium 99	2.74		24.4	28.13		2.68	1.34	0.230	pCi/g	104	75 - 125
Carrier	MS %Yield	MS Qualifier	Limits								
Re	89		30 - 110								

Lab Sample ID: 160-16856-1 MSD

Matrix: Solid

Analysis Batch: 245741

Client Sample ID: L08-14-01-T-R-S-00

Prep Type: Total/NA

Prep Batch: 245279

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	2.74		24.7	28.38		2.76	1.40	0.239	pCi/g	104	75 - 125	0.05	1
Carrier	MSD %Yield	MSD Qualifier	Limits										
Re	87		30 - 110										

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

Lab Sample ID: MB 160-245328/1-A

Matrix: Solid

Analysis Batch: 245579

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 245328

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.01003	U	0.0333	0.0334		0.0622	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Americium 241	0.005574	U	0.0116	0.0117		0.0202	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Bismuth 212	0.002099	U	0.109	0.109		0.216	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Bismuth 214	-0.01253	U	0.137	0.137		0.0457	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Lead 212	-0.005737	U	0.0796	0.0796		0.0252	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Lead 214	0.002978	U	0.0141	0.0141		0.0289	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Potassium 40	-0.06718	U	2.69	2.69		0.213	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Protactinium 231	-0.07316	U	0.206	0.207		0.366	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Radium 226	-0.01253	U	0.137	0.137	1.00	0.0457	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Thorium 234	0.008860	U	0.0369	0.0369	1.00	0.269	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Uranium 235	-0.006168	U	0.0483	0.0483		0.0857	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Protactinium 234m	0.2078	U	0.615	0.616		1.21	pCi/g	04/12/16 07:30	04/12/16 19:54	1
Thorium 232	0.01003	U	0.0333	0.0334		0.0622	pCi/g	04/12/16 07:30	04/12/16 19:54	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	04/12/16 07:30	04/12/16 19:54	1

TestAmerica St. Louis

QC Sample Results

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

TestAmerica Job ID: 160-16856-1

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

Lab Sample ID: LCS 160-245328/2-A
Matrix: Solid
Analysis Batch: 245578

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245328

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	101	102.5		10.7		0.502	pCi/g	102	87 - 116
Cesium 137	34.1	36.77		3.80	0.200	0.160	pCi/g	108	87 - 120
Cobalt 60	31.6	33.69		3.34		0.0887	pCi/g	107	87 - 115

Lab Sample ID: 160-16856-18 DU
Matrix: Solid
Analysis Batch: 245577

Client Sample ID: L08-14-17-T-E-S-00
Prep Type: Total/NA
Prep Batch: 245328

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	1.04		1.094		0.161		0.0793	pCi/g	0.19	1
Americium 241	0.0179	U	0.001797	U	0.0517		0.0872	pCi/g	0.15	1
Bismuth 212	1.36		1.306		0.369		0.292	pCi/g	0.07	1
Bismuth 214	0.700		0.7334		0.112		0.0529	pCi/g	0.15	1
Lead 212	0.907		1.006		0.145		0.0513	pCi/g	0.35	1
Lead 214	0.785		0.8117		0.112		0.0663	pCi/g	0.12	1
Potassium 40	17.3		16.88		2.00		0.298	pCi/g	0.10	1
Protactinium 231	0.460	U	0.5293	U	0.266		0.919	pCi/g	0.13	1
Radium 226	0.700		0.7334		0.112	1.00	0.0529	pCi/g	0.15	1
Thorium 234	1.21		1.135		0.439	1.00	0.661	pCi/g	0.08	1
Uranium 235	0.107	U	0.1562		0.119		0.153	pCi/g	0.18	1
Protactinium 234m	-0.338	U	-0.3009	U	2.28		4.56	pCi/g	0	1
Thorium 232	1.04		1.094		0.161		0.0793	pCi/g	0.19	1
Other Detected Radionuclides										
Tl-208	0.303		0.3444		0.0593		0.0348	pCi/g	0.36	1

QC Association Summary

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

TestAmerica Job ID: 160-16856-1

Metals

Prep Batch: 245279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-1 MS	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-1 MSD	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	None	
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	None	
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	None	
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	None	
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	None	
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	None	
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	None	
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	None	
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	None	
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	None	
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	None	
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	None	
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	None	
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	None	
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	None	
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	None	
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	None	
LCS 160-245279/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-245279/1-A	Method Blank	Total/NA	Solid	None	

Analysis Batch: 245740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-1 MS	L08-14-01-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-1 MSD	L08-14-01-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	6020A	245279
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	6020A	245279
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	6020A	245279
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	6020A	245279
LCS 160-245279/2-A	Lab Control Sample	Total/NA	Solid	6020A	245279
MB 160-245279/1-A	Method Blank	Total/NA	Solid	6020A	245279

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-16856-1

General Chemistry

Analysis Batch: 245289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-1 DU	L08-14-01-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	Moisture	
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	Moisture	
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	Moisture	
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	Moisture	

Rad

Leach Batch: 245270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	Dry and Grind	
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	Dry and Grind	
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	Dry and Grind	
160-16856-18 DU	L08-14-17-T-E-S-00	Total/NA	Solid	Dry and Grind	

Prep Batch: 245279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-1 MS	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-1 MSD	L08-14-01-T-R-S-00	Total/NA	Solid	None	
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	None	

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-16856-1

Rad (Continued)

Prep Batch: 245279 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	None	
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	None	
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	None	
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	None	
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	None	
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	None	
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	None	
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	None	
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	None	
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	None	
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	None	
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	None	
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	None	
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	None	
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	None	
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	None	
LCS 160-245279/2-A	Lab Control Sample	Total/NA	Solid	None	
MB 160-245279/1-A	Method Blank	Total/NA	Solid	None	

Prep Batch: 245328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-16856-1	L08-14-01-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-2	L08-14-02-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-3	L08-14-03-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-4	L08-14-04-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-5	L08-14-05-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-6	L08-14-06-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-7	L08-14-07-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-8	L08-14-08-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-9	L08-14-09-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-10	L08-14-09-T-R-Q-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-11	L08-14-10-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-12	L08-14-11-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-13	L08-14-12-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-14	L08-14-13-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-15	L08-14-14-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-16	L08-14-15-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-17	L08-14-16-T-R-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-18	L08-14-17-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
160-16856-18 DU	L08-14-17-T-E-S-00	Total/NA	Solid	Fill_Geo-0	245270
LCS 160-245328/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-0	
MB 160-245328/1-A	Method Blank	Total/NA	Solid	Fill_Geo-0	

Tracer/Carrier Summary

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

TestAmerica Job ID: 160-16856-1

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)
160-16856-1	L08-14-01-T-R-S-00	88
160-16856-1 MS	L08-14-01-T-R-S-00	89
160-16856-1 MSD	L08-14-01-T-R-S-00	87
160-16856-2	L08-14-02-T-E-S-00	88
160-16856-3	L08-14-03-T-R-S-00	89
160-16856-4	L08-14-04-T-E-S-00	92
160-16856-5	L08-14-05-T-R-S-00	88
160-16856-6	L08-14-06-T-E-S-00	88
160-16856-7	L08-14-07-T-E-S-00	91
160-16856-8	L08-14-08-T-E-S-00	92
160-16856-9	L08-14-09-T-R-S-00	89
160-16856-10	L08-14-09-T-R-Q-00	91
160-16856-11	L08-14-10-T-E-S-00	93
160-16856-12	L08-14-11-T-E-S-00	95
160-16856-13	L08-14-12-T-E-S-00	93
160-16856-14	L08-14-13-T-E-S-00	94
160-16856-15	L08-14-14-T-R-S-00	97
160-16856-16	L08-14-15-T-E-S-00	91
160-16856-17	L08-14-16-T-R-S-00	96
160-16856-18	L08-14-17-T-E-S-00	94
LCS 160-245279/2-A	Lab Control Sample	91
MB 160-245279/1-A	Method Blank	91

Tracer/Carrier Legend

Re = Re