

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: 160-3234-2

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

For:

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

Attn: Martin Swanson



Authorized for release by:
9/3/2013 5:24:07 PM

Ivan Vania, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

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

TestAmerica Job ID: 160-3234-2

Job ID: 160-3234-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Westinghouse Electric Company LLC

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

Report Number: 160-3234-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 08/03/2013; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.8° C, 2.2° C, 23.7° C and 25.1° C.

TECHNETIUM-99 (ICPMS)

Samples L100801BRS00 (160-3234-1), L100802BES00 (160-3234-2), L100803BES00 (160-3234-3), L100804BRS00 (160-3234-4), L100805BES00 (160-3234-5), L100806BES00 (160-3234-6), L100807BRQ00 (160-3234-7), L100807BRS00 (160-3234-8), L100808BES00 (160-3234-9), L100809BES00 (160-3234-10), L100810BES00 (160-3234-11), L100811BRS00 (160-3234-12), L100812BES00 (160-3234-13), L100813BES00 (160-3234-14) and L100814BRS00 (160-3234-15) were analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/07/2013 and analyzed on 08/09/2013.

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

PERCENT SOLIDS

Samples L100801BRS00 (160-3234-1), L100802BES00 (160-3234-2), L100803BES00 (160-3234-3), L100804BRS00 (160-3234-4),

Case Narrative

Client: Westinghouse Electric Company LLC
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TestAmerica Job ID: 160-3234-2

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Laboratory: TestAmerica St. Louis (Continued)

L100805BES00 (160-3234-5), L100806BES00 (160-3234-6), L100807BRQ00 (160-3234-7), L100807BRS00 (160-3234-8), L100808BES00 (160-3234-9), L100809BES00 (160-3234-10), L100810BES00 (160-3234-11), L100811BRS00 (160-3234-12), L100812BES00 (160-3234-13), L100813BES00 (160-3234-14) and L100814BRS00 (160-3234-15) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 08/05/2013.

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

CESIUM-137 & OTHER GAMMA EMITTERS (GS)

Samples L100801BRS00 (160-3234-1), L100802BES00 (160-3234-2), L100803BES00 (160-3234-3), L100804BRS00 (160-3234-4), L100805BES00 (160-3234-5), L100806BES00 (160-3234-6), L100807BRQ00 (160-3234-7), L100807BRS00 (160-3234-8), L100808BES00 (160-3234-9), L100809BES00 (160-3234-10), L100810BES00 (160-3234-11), L100811BRS00 (160-3234-12), L100812BES00 (160-3234-13), L100813BES00 (160-3234-14) and L100814BRS00 (160-3234-15) were analyzed for Cesium-137 & Other Gamma Emitters (GS) in accordance with DOE GA-01-R. The samples were leached on 08/06/2013, prepared on 08/08/2013 and analyzed on 08/08/2013, 08/09/2013 and 08/12/2013.

Preparation Batch 65532:

Lead-214 analyzed by gamma spectroscopy was detected above the MDC in the method blank. Variations in Compton backgrounds and statistical analyses allow for small area counts in the ROIs of this nuclide. Other Uranium decay chain products are not present in the blank to support Lead-214 identification. The data is reported. (160-3234-1 DU), (LCS 160-65532/2-A), (MB 160-65532/1-A), L100801BRS00 (160-3234-1), L100802BES00 (160-3234-2), L100803BES00 (160-3234-3), L100804BRS00 (160-3234-4), L100805BES00 (160-3234-5), L100806BES00 (160-3234-6), L100807BRQ00 (160-3234-7), L100807BRS00 (160-3234-8), L100808BES00 (160-3234-9), L100809BES00 (160-3234-10), L100810BES00 (160-3234-11), L100811BRS00 (160-3234-12), L100812BES00 (160-3234-13), L100813BES00 (160-3234-14), L100814BRS00 (160-3234-15)

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

Hematite Decommissioning Project

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

Revision: 3

Page 1 of 1

Westinghouse Non-Proprietary Class 3

FORM HDP-PR-QA-006-1

CHAIN OF CUSTODY

Instructions: Each time the container is transferred to another organization, a person from each organization should sign the CoC. The Laboratory/End User must verify that the sample is correctly identified before the sample is released for use or analysis and send the completed CoC to HDP.

Chain of Custody ID No. F-080213-02 Page 1/2				Requested Analysis										Laboratory Name:		
Project Name:				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	To-99	Gamma Spec (21 day ingrow for Ra-226)						Total Containers	TA-MO	
Contact Person:															Laboratory Address:	
Phone Number:															Phone No.	
Sampler Name															Laboratory Contact Person:	
															Phone No.	
				Turn Around Time												
				Rush (7 days)												
				Remarks												
Sample ID	Date	Time	Matrix													
L100801BRS00	8/1/2013	15:14	S	C	X		X	X						1	Sys-FSS Samples LSA 10-08	
L100802BES00	8/1/2013	15:23	S	C	X		X	X						1		
L100803BES00	8/1/2013	15:54	S	C	X		X	X						1		
L100804BRS00	8/1/2013	16:02	S	C	X		X	X						1		
L100805BES00	8/1/2013	16:08	S	C	X		X	X						1		
L100806BES00	8/1/2013	16:16	S	C	X		X	X						1		
L100807BRQ00	8/1/2013	17:40	S	C	X		X	X						1		
L100807BRS00	8/1/2013	17:40	S	C	X		X	X						1		
L100808BES00	8/1/2013	17:45	S	C	X		X	X						1		
L100809BES00	8/1/2013	16:35	S	C	X		X	X						1		
L100810BES00	8/1/2013	16:48	S	C	X		X	X						1		
L100811BRS00	8/1/2013	18:15	S	C	X		X	X						1	Sys-FSS Samples LSA 10-08	
Relinquished by:		Date/Time		Received by:		Date/Time		Total		Cooler Temperature:						
Company Name:		8-3-13 1500		Company Name:		8-3-13 15:00		15		4 Degrees C						
Received by:		Date/Time		Relinquished by:		Date/Time		Cooler ID:		Shipper and Number:						
Company Name:		8-3-13 1601		Company Name:				0803-02								
Relinquished by:		Date/Time		Received by:		Date/Time		Comments: Please re-analyze samples after a 21 day ingrowth period.								
Company Name:				Company Name:				Verified By:								

3234-1
3234-2

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-3234-2

Login Number: 3234

List Source: TestAmerica St. Louis

List Number: 1

Creator: Vania, Ivan H

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Where required
Cooler Temperature is acceptable.	True	See NCM
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Definitions/Glossary

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

TestAmerica Job ID: 160-3234-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
F	Duplicate RPD exceeds the control 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
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

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

TestAmerica Job ID: 160-3234-2

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

Protocol References:

DOE = U.S. Department of Energy

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 160-3234-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-3234-1	L100801BRS00	Solid	08/01/13 15:14	08/03/13 16:01
160-3234-2	L100802BES00	Solid	08/01/13 15:23	08/03/13 16:01
160-3234-3	L100803BES00	Solid	08/01/13 15:54	08/03/13 16:01
160-3234-4	L100804BRS00	Solid	08/01/13 16:02	08/03/13 16:01
160-3234-5	L100805BES00	Solid	08/01/13 16:08	08/03/13 16:01
160-3234-6	L100806BES00	Solid	08/01/13 16:16	08/03/13 16:01
160-3234-7	L100807BRQ00	Solid	08/01/13 17:40	08/03/13 16:01
160-3234-8	L100807BRS00	Solid	08/01/13 17:40	08/03/13 16:01
160-3234-9	L100808BES00	Solid	08/01/13 17:45	08/03/13 16:01
160-3234-10	L100809BES00	Solid	08/01/13 16:35	08/03/13 16:01
160-3234-11	L100810BES00	Solid	08/01/13 16:48	08/03/13 16:01
160-3234-12	L100811BRS00	Solid	08/01/13 18:15	08/03/13 16:01
160-3234-13	L100812BES00	Solid	08/01/13 18:09	08/03/13 16:01
160-3234-14	L100813BES00	Solid	08/01/13 17:01	08/03/13 16:01
160-3234-15	L100814BRS00	Solid	08/01/13 18:00	08/03/13 16:01

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100801BRS00

Lab Sample ID: 160-3234-1

Date Collected: 08/01/13 15:14

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.952		0.128	0.161		0.0912	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Bismuth 212	1.08		0.363	0.379		0.373	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Bismuth 214	0.973		0.0991	0.142		0.0683	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Lead 212	0.999		0.0703	0.147		0.0618	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Lead 214	1.15		0.0882	0.149		0.0755	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Potassium 40	16.2		1.04	1.95		0.342	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Protactinium 231	0.419	U	0.220	0.224		1.14	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Radium 226	0.973		0.0991	0.142	1.00	0.0683	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Thorium 232	0.952		0.128	0.161		0.0912	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Thorium 234	5.97		0.560	0.838		1.13	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Uranium 235	1.55		0.264	0.308		0.281	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Americium 241	0.0254	U	0.0743	0.0743		0.124	pCi/g	08/08/13 10:41	09/02/13 20:53	1
Protactinium 234m	15.7		4.02	4.32		3.26	pCi/g	08/08/13 10:41	09/02/13 20:53	1

Client Sample ID: L100802BES00

Lab Sample ID: 160-3234-2

Date Collected: 08/01/13 15:23

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.01		0.142	0.175		0.157	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Bismuth 212	1.17		0.447	0.464		0.438	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Bismuth 214	1.05		0.117	0.160		0.0765	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Lead 212	1.04		0.0784	0.156		0.0655	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Lead 214	1.11		0.106	0.157		0.0858	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Potassium 40	17.6		1.24	2.18		0.160	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Protactinium 231	0.525	U	0.261	0.267		1.18	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Radium 226	1.05		0.117	0.160	1.00	0.0765	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Thorium 232	1.01		0.142	0.175		0.157	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Thorium 234	1.58		0.617	0.638		0.822	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Uranium 235	0.165	U	0.147	0.148		0.253	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Americium 241	0.00525	U	0.0623	0.0623		0.106	pCi/g	08/08/13 10:41	08/30/13 04:02	1
Protactinium 234m	2.60	U	3.65	3.66		6.07	pCi/g	08/08/13 10:41	08/30/13 04:02	1

Client Sample ID: L100803BES00

Lab Sample ID: 160-3234-3

Date Collected: 08/01/13 15:54

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.05		0.136	0.173		0.113	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Bismuth 212	1.05		0.381	0.396		0.490	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Bismuth 214	0.978		0.125	0.161		0.0882	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Lead 212	0.939		0.0779	0.144		0.0703	pCi/g	08/08/13 10:41	08/30/13 04:01	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100803BES00

Lab Sample ID: 160-3234-3

Date Collected: 08/01/13 15:54

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Lead 214	1.11		0.0938	0.149		0.0747	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Potassium 40	17.7		1.28	2.22		0.171	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Protactinium 231	0.732	U	0.402	0.409		1.36	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Radium 226	0.978		0.125	0.161	1.00	0.0882	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Thorium 232	1.05		0.136	0.173		0.113	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Thorium 234	1.79		0.728	0.751		0.928	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Uranium 235	0.373		0.185	0.189		0.229	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Americium 241	0.00538	U	0.0702	0.0702		0.118	pCi/g	08/08/13 10:41	08/30/13 04:01	1
Protactinium 234m	4.07	U	3.59	3.62		5.86	pCi/g	08/08/13 10:41	08/30/13 04:01	1

Client Sample ID: L100804BRS00

Lab Sample ID: 160-3234-4

Date Collected: 08/01/13 16:02

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.799		0.139	0.161		0.0980	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Bismuth 212	0.922		0.391	0.403		0.396	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Bismuth 214	0.943		0.0878	0.132		0.0528	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Lead 212	0.900		0.0632	0.132		0.0522	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Lead 214	1.03		0.0881	0.138		0.0611	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Potassium 40	15.7		0.995	1.89		0.284	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Protactinium 231	0.523	U	0.298	0.303		0.968	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Radium 226	0.943		0.0878	0.132	1.00	0.0528	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Thorium 232	0.799		0.139	0.161		0.0980	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Thorium 234	1.12		0.612	0.623		0.800	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Uranium 235	0.109	U	0.128	0.128		0.215	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Americium 241	0.0102	U	0.0512	0.0512		0.0861	pCi/g	08/08/13 10:41	08/30/13 04:03	1
Protactinium 234m	1.69	U	2.11	2.12		4.52	pCi/g	08/08/13 10:41	08/30/13 04:03	1

Client Sample ID: L100805BES00

Lab Sample ID: 160-3234-5

Date Collected: 08/01/13 16:08

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.869		0.101	0.135		0.101	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Bismuth 212	0.997		0.365	0.380		0.334	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Bismuth 214	0.993		0.0998	0.144		0.0670	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Lead 212	0.812		0.0655	0.124		0.0709	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Lead 214	1.12		0.0847	0.144		0.0653	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Potassium 40	17.1		0.982	2.01		0.251	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Protactinium 231	0.368	U	0.251	0.254		0.947	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Radium 226	0.993		0.0998	0.144	1.00	0.0670	pCi/g	08/08/13 10:41	08/30/13 08:34	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100805BES00

Lab Sample ID: 160-3234-5

Date Collected: 08/01/13 16:08

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 232	0.869		0.101	0.135		0.101	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Thorium 234	1.24		0.638	0.651		0.806	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Uranium 235	0.129	U	0.117	0.118		0.182	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Americium 241	-0.0134	U	0.0586	0.0586		0.0982	pCi/g	08/08/13 10:41	08/30/13 08:34	1
Protactinium 234m	3.44	U	1.93	1.96		3.88	pCi/g	08/08/13 10:41	08/30/13 08:34	1

Client Sample ID: L100806BES00

Lab Sample ID: 160-3234-6

Date Collected: 08/01/13 16:16

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.829		0.107	0.136		0.104	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Bismuth 212	1.34		0.403	0.426		0.340	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Bismuth 214	1.05		0.104	0.151		0.0614	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Lead 212	0.789		0.0640	0.120		0.0550	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Lead 214	1.01		0.0809	0.133		0.0796	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Potassium 40	14.1		1.03	1.77		0.138	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Protactinium 231	0.241	U	0.162	0.164		1.11	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Radium 226	1.05		0.104	0.151	1.00	0.0614	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Thorium 232	0.829		0.107	0.136		0.104	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Thorium 234	1.31		0.625	0.640		0.786	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Uranium 235	0.0289	U	0.127	0.127		0.214	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Americium 241	0.0244	U	0.0504	0.0505		0.0845	pCi/g	08/08/13 10:41	08/30/13 08:31	1
Protactinium 234m	-0.734	U	2.79	2.79		4.90	pCi/g	08/08/13 10:41	08/30/13 08:31	1

Client Sample ID: L100807BRQ00

Lab Sample ID: 160-3234-7

Date Collected: 08/01/13 17:40

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.817		0.111	0.139		0.0976	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Bismuth 212	1.20		0.497	0.513		0.456	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Bismuth 214	0.907		0.118	0.151		0.0783	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Lead 212	0.704		0.0676	0.113		0.0629	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Lead 214	1.00		0.0939	0.140		0.0654	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Potassium 40	14.0		1.13	1.82		0.169	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Protactinium 231	0.348	U	0.249	0.252		1.22	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Radium 226	0.907		0.118	0.151	1.00	0.0783	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Thorium 232	0.817		0.111	0.139		0.0976	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Thorium 234	0.671	U	0.274	0.283		0.757	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Uranium 235	0.132	U	0.143	0.144		0.257	pCi/g	08/08/13 10:41	08/30/13 08:32	1
Americium 241	0.00291	U	0.0587	0.0587		0.0995	pCi/g	08/08/13 10:41	08/30/13 08:32	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100807BRQ00

Lab Sample ID: 160-3234-7

Date Collected: 08/01/13 17:40

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Protactinium 234m	1.31	U	2.81	2.82		4.87	pCi/g	08/08/13 10:41	08/30/13 08:32	1

Client Sample ID: L100807BRS00

Lab Sample ID: 160-3234-8

Date Collected: 08/01/13 17:40

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.770		0.0967	0.125		0.0715	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Bismuth 212	1.00		0.347	0.363		0.323	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Bismuth 214	0.923		0.0909	0.132		0.0591	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Lead 212	0.749		0.0546	0.111		0.0478	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Lead 214	0.976		0.0850	0.132		0.0590	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Potassium 40	12.7		0.853	1.55		0.299	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Protactinium 231	0.357	U	0.205	0.209		0.875	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Radium 226	0.923		0.0909	0.132	1.00	0.0591	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Thorium 232	0.770		0.0967	0.125		0.0715	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Thorium 234	0.658		0.424	0.430		0.606	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Uranium 235	0.0499	U	0.104	0.104		0.182	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Americium 241	-0.00656	U	0.0461	0.0461		0.0776	pCi/g	08/08/13 10:41	08/30/13 08:33	1
Protactinium 234m	0.908	U	1.79	1.79		3.07	pCi/g	08/08/13 10:41	08/30/13 08:33	1

Client Sample ID: L100808BES00

Lab Sample ID: 160-3234-9

Date Collected: 08/01/13 17:45

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	1.01		0.110	0.151		0.0755	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Bismuth 212	1.51		0.466	0.491		0.370	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Bismuth 214	1.08		0.0972	0.148		0.0614	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Lead 212	1.12		0.0677	0.160		0.0505	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Lead 214	1.08		0.0897	0.144		0.0709	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Potassium 40	17.3		1.02	2.05		0.309	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Protactinium 231	0.670	U	0.449	0.455		0.871	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Radium 226	1.08		0.0972	0.148	1.00	0.0614	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Thorium 232	1.01		0.110	0.151		0.0755	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Thorium 234	0.737	U	0.311	0.321		0.797	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Uranium 235	0.0388	U	0.0701	0.0702		0.231	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Americium 241	-0.00229	U	0.0630	0.0630		0.106	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Protactinium 234m	0.546	U	2.83	2.83		4.93	pCi/g	08/08/13 10:41	08/30/13 09:56	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100809BES00

Lab Sample ID: 160-3234-10

Date Collected: 08/01/13 16:35

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.842		0.123	0.150		0.102	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Bismuth 212	1.13		0.379	0.396		0.334	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Bismuth 214	0.896		0.0965	0.134		0.0663	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Lead 212	0.773		0.0633	0.118		0.0657	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Lead 214	1.06		0.0863	0.140		0.0676	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Potassium 40	15.4		0.954	1.84		0.266	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Protactinium 231	0.304	U	0.172	0.175		1.01	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Radium 226	0.896		0.0965	0.134	1.00	0.0663	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Thorium 232	0.842		0.123	0.150		0.102	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Thorium 234	1.12		0.623	0.634		0.789	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Uranium 235	0.0915	U	0.130	0.130		0.205	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Americium 241	0.0159	U	0.0523	0.0523		0.0876	pCi/g	08/08/13 10:41	08/30/13 09:57	1
Protactinium 234m	0.977	U	2.50	2.50		4.29	pCi/g	08/08/13 10:41	08/30/13 09:57	1

Client Sample ID: L100810BES00

Lab Sample ID: 160-3234-11

Date Collected: 08/01/13 16:48

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.833		0.118	0.146		0.0994	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Bismuth 212	0.944		0.270	0.288		0.227	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Bismuth 214	0.854		0.0933	0.129		0.0579	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Lead 212	0.749		0.0617	0.115		0.0532	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Lead 214	1.06		0.0908	0.143		0.0549	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Potassium 40	13.8		1.00	1.73		0.135	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Protactinium 231	0.338	U	0.221	0.224		1.03	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Radium 226	0.854		0.0933	0.129	1.00	0.0579	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Thorium 232	0.833		0.118	0.146		0.0994	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Thorium 234	1.30		0.558	0.574		0.730	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Uranium 235	0.0951	U	0.129	0.129		0.223	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Americium 241	0.00361	U	0.0534	0.0534		0.0906	pCi/g	08/08/13 10:41	08/30/13 09:54	1
Protactinium 234m	0.000	U	2.80	2.80		4.33	pCi/g	08/08/13 10:41	08/30/13 09:54	1

Client Sample ID: L100811BRS00

Lab Sample ID: 160-3234-12

Date Collected: 08/01/13 18:15

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.808		0.0915	0.123		0.0948	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Bismuth 212	1.19		0.434	0.451		0.383	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Bismuth 214	1.10		0.106	0.156		0.0624	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Lead 212	0.816		0.0641	0.123		0.0543	pCi/g	08/08/13 10:41	08/30/13 09:56	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100811BRS00

Lab Sample ID: 160-3234-12

Date Collected: 08/01/13 18:15

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Lead 214	1.17		0.0937	0.154		0.0758	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Potassium 40	14.7		1.04	1.83		0.368	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Protactinium 231	0.318	U	0.213	0.216		1.05	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Radium 226	1.10		0.106	0.156	1.00	0.0624	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Thorium 232	0.808		0.0915	0.123		0.0948	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Thorium 234	1.28		0.630	0.644		0.801	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Uranium 235	0.0927	U	0.103	0.103		0.151	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Americium 241	0.0333	U	0.0516	0.0517		0.0856	pCi/g	08/08/13 10:41	08/30/13 09:56	1
Protactinium 234m	0.277	U	2.00	2.00		4.54	pCi/g	08/08/13 10:41	08/30/13 09:56	1

Client Sample ID: L100812BES00

Lab Sample ID: 160-3234-13

Date Collected: 08/01/13 18:09

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.995		0.134	0.168		0.0675	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Bismuth 212	1.26		0.501	0.518		0.466	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Bismuth 214	1.02		0.127	0.165		0.0874	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Lead 212	0.925		0.0789	0.143		0.0709	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Lead 214	1.08		0.111	0.158		0.0796	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Potassium 40	17.1		1.33	2.19		0.343	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Protactinium 231	0.228	U	0.198	0.199		1.28	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Radium 226	1.02		0.127	0.165	1.00	0.0874	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Thorium 232	0.995		0.134	0.168		0.0675	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Thorium 234	1.14		0.568	0.580		0.794	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Uranium 235	0.115	U	0.182	0.183		0.273	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Americium 241	0.0194	U	0.0656	0.0656		0.110	pCi/g	08/08/13 10:41	08/30/13 09:55	1
Protactinium 234m	1.12	U	3.23	3.23		5.66	pCi/g	08/08/13 10:41	08/30/13 09:55	1

Client Sample ID: L100813BES00

Lab Sample ID: 160-3234-14

Date Collected: 08/01/13 17:01

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.936		0.137	0.167		0.0985	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Bismuth 212	1.27		0.440	0.459		0.377	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Bismuth 214	1.04		0.113	0.156		0.0731	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Lead 212	0.891		0.0700	0.135		0.0603	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Lead 214	1.09		0.0884	0.143		0.0652	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Potassium 40	14.8		1.10	1.87		0.260	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Protactinium 231	0.504	U	0.213	0.220		1.00	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Radium 226	1.04		0.113	0.156	1.00	0.0731	pCi/g	08/08/13 10:41	08/30/13 10:37	1

TestAmerica St. Louis

Client Sample Results

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

TestAmerica Job ID: 160-3234-2

Client Sample ID: L100813BES00

Lab Sample ID: 160-3234-14

Date Collected: 08/01/13 17:01

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium 232	0.936		0.137	0.167		0.0985	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Thorium 234	1.05		0.511	0.523		0.712	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Uranium 235	0.106	U	0.131	0.132		0.218	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Americium 241	-0.00372	U	0.233	0.233		0.0947	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Protactinium 234m	0.850	U	2.88	2.88		5.05	pCi/g	08/08/13 10:41	08/30/13 10:37	1

Client Sample ID: L100814BRS00

Lab Sample ID: 160-3234-15

Date Collected: 08/01/13 18:00

Matrix: Solid

Date Received: 08/03/13 16:01

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.741		0.119	0.141		0.0890	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Bismuth 212	0.900		0.405	0.416		0.371	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Bismuth 214	0.895		0.112	0.145		0.0701	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Lead 212	0.641		0.0629	0.104		0.0571	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Lead 214	0.922		0.0878	0.130		0.0606	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Potassium 40	10.9		0.986	1.49		0.165	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Protactinium 231	0.350	U	0.411	0.412		0.672	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Radium 226	0.895		0.112	0.145	1.00	0.0701	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Thorium 232	0.741		0.119	0.141		0.0890	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Thorium 234	0.886		0.594	0.601		0.763	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Uranium 235	0.110	U	0.143	0.144		0.236	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Americium 241	0.00366	U	0.0530	0.0530		0.0899	pCi/g	08/08/13 10:41	08/30/13 10:37	1
Protactinium 234m	0.728	U	2.84	2.84		5.05	pCi/g	08/08/13 10:41	08/30/13 10:37	1

TestAmerica St. Louis

QC Sample Results

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

TestAmerica Job ID: 160-3234-2

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

Lab Sample ID: MB 160-65532/1-A

Matrix: Solid

Analysis Batch: 70078

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 65532

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.0000	U	0.0124	0.0124		0.0719	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Bismuth 212	0.0000	U	0.0390	0.0390		0.279	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Bismuth 214	0.005983	U	0.0189	0.0189		0.0386	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Lead 212	-0.001503	U	0.0181	0.0181		0.0292	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Lead 214	0.03985		0.0202	0.0207		0.0270	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Potassium 40	-0.08289	U	3.32	3.32		0.434	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Protactinium 231	0.03928	U	0.0989	0.0990		0.381	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Radium 226	0.005983	U	0.0189	0.0189	1.00	0.0386	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Thorium 232	0.0000	U	0.0124	0.0124		0.0719	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Thorium 234	-0.03141	U	0.193	0.193		0.261	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Uranium 235	0.03595	U	0.0384	0.0386		0.0616	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Americium 241	0.002361	U	0.0102	0.0102		0.0203	pCi/g	08/08/13 10:41	09/02/13 23:30	1
Protactinium 234m	0.2854	U	0.956	0.957		1.85	pCi/g	08/08/13 10:41	09/02/13 23:30	1

Lab Sample ID: LCS 160-65532/2-A

Matrix: Solid

Analysis Batch: 70040

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 65532

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium 241	97.7	93.54		9.73		0.484	pCi/g	96	87 - 116
Cesium 137	31.6	30.72		3.21		0.129	pCi/g	97	87 - 120
Cobalt 60	24.8	23.73		2.40		0.0715	pCi/g	96	87 - 115

Lab Sample ID: 160-3234-1 DU

Matrix: Solid

Analysis Batch: 70078

Client Sample ID: L100801BRS00

Prep Type: Total/NA

Prep Batch: 65532

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Actinium 228	0.952		1.058		0.172		0.141	pCi/g	0.32	1
Bismuth 212	1.08		1.360		0.468		0.429	pCi/g	0.33	1
Bismuth 214	0.973		1.077		0.168		0.0835	pCi/g	0.34	1
Lead 212	0.999		1.020		0.152		0.0614	pCi/g	0.07	1
Lead 214	1.15		1.146		0.153		0.0899	pCi/g	0.01	1
Potassium 40	16.2		16.30		2.03		0.260	pCi/g	0.03	1
Protactinium 231	0.419	U	-0.5947	U F	0.773		1.27	pCi/g	1.02	1
Radium 226	0.973		1.077		0.168	1.00	0.0835	pCi/g	0.34	1
Thorium 232	0.952		1.058		0.172		0.141	pCi/g	0.32	1
Thorium 234	5.97		5.811		0.853		1.18	pCi/g	0.09	1
Uranium 235	1.55		1.797		0.291		0.239	pCi/g	0.41	1
Americium 241	0.0254	U	0.04114	U	0.0585		0.0970	pCi/g	0.12	1
Protactinium 234m	15.7		17.20		5.11		3.69	pCi/g	0.16	1

TestAmerica St. Louis

QC Association Summary

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

TestAmerica Job ID: 160-3234-2

Rad

Leach Batch: 64984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3234-1	L100801BRS00	Total/NA	Solid	Dry and Grind	
160-3234-1 DU	L100801BRS00	Total/NA	Solid	Dry and Grind	
160-3234-2	L100802BES00	Total/NA	Solid	Dry and Grind	
160-3234-3	L100803BES00	Total/NA	Solid	Dry and Grind	
160-3234-4	L100804BRS00	Total/NA	Solid	Dry and Grind	
160-3234-5	L100805BES00	Total/NA	Solid	Dry and Grind	
160-3234-6	L100806BES00	Total/NA	Solid	Dry and Grind	
160-3234-7	L100807BRQ00	Total/NA	Solid	Dry and Grind	
160-3234-8	L100807BRS00	Total/NA	Solid	Dry and Grind	
160-3234-9	L100808BES00	Total/NA	Solid	Dry and Grind	
160-3234-10	L100809BES00	Total/NA	Solid	Dry and Grind	
160-3234-11	L100810BES00	Total/NA	Solid	Dry and Grind	
160-3234-12	L100811BRS00	Total/NA	Solid	Dry and Grind	
160-3234-13	L100812BES00	Total/NA	Solid	Dry and Grind	
160-3234-14	L100813BES00	Total/NA	Solid	Dry and Grind	
160-3234-15	L100814BRS00	Total/NA	Solid	Dry and Grind	

Prep Batch: 65532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-3234-1	L100801BRS00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-1 DU	L100801BRS00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-2	L100802BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-3	L100803BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-4	L100804BRS00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-5	L100805BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-6	L100806BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-7	L100807BRQ00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-8	L100807BRS00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-9	L100808BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-10	L100809BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-11	L100810BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-12	L100811BRS00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-13	L100812BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-14	L100813BES00	Total/NA	Solid	Fill_Geo-21	64984
160-3234-15	L100814BRS00	Total/NA	Solid	Fill_Geo-21	64984
LCS 160-65532/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-65532/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	