

# 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: 160-17119-2

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

For:

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

Attn: Mr. Martin Swanson

*Rhonda Ridenhower*

Authorized for release by:

5/24/2016 11:11:39 AM

Rhonda Ridenhower, Manager of Project Management  
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Designee for

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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: 160-17119-2

**Job ID: 160-17119-2**

**Laboratory: TestAmerica St. Louis**

**Narrative**

## CASE NARRATIVE

**Client: Westinghouse Electric Company LLC**

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

**Report Number: 160-17119-2**

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 04/26/2016; the samples arrived in good condition, properly preserved. The temperatures of the 2 coolers at receipt time were 19.0° C and 19.0° C.

### **RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)**

Samples L11-02-01-P-S-S-00 (160-17119-1), L11-02-02-P-R-S-00 (160-17119-2), L11-02-04-P-S-S-00 (160-17119-3), L11-02-05-P-R-S-00 (160-17119-4), L11-02-05-P-R-Q-00 (160-17119-5), L11-02-07-P-S-S-00 (160-17119-6), L11-02-08-P-R-S-00 (160-17119-7), L11-02-10-P-S-S-00 (160-17119-8), L11-02-11-P-R-S-00 (160-17119-9), L11-02-13-P-S-S-00 (160-17119-10), L11-02-14-P-R-S-00 (160-17119-11), L11-02-16-P-S-S-00 (160-17119-12), L11-02-17-P-R-S-00 (160-17119-13), L11-02-17-P-R-Q-00 (160-17119-14), L11-02-19-P-S-S-00 (160-17119-15), L11-02-20-P-R-S-00 (160-17119-16), L11-02-22-P-S-S-00 (160-17119-17) and L11-02-23-P-R-S-00 (160-17119-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA\_01\_R. The samples were dried on 04/26/2016, prepared on 04/28/2016 and analyzed on 05/20/2016 and 05/23/2016.

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

Hematite Decommissioning Project

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

Revision: 4

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-042616-05		Page	1/2		Requested Analysis										Laboratory Name:			
Project Name: Westinghouse Electric Company							Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)							Total Containers	TA-MO	
Contact Person: Clark Evers																			Laboratory Address: 13715 Rider Trail North	
Phone Number: 314-810-3336																			Phone No. 314-298-8566	
Sampler Name John Michel																			Laboratory Contact Person: Ivan Vania	
							Phone No. 708-870-8453		Turn Around Time											
							Rush		(7 days)						Remarks					
Sample ID	Date	Time	Matrix																	
L11-02-01-P-S-S-00	4/25/2016	10:00	S	G	X		X	X								1	LSA 11-02			
L11-02-02-P-R-S-00	4/25/2016	10:10	S	C	X		X	X								1	LSA 11-02			
L11-02-04-P-S-S-00	4/25/2016	10:35	S	G	X		X	X								1	LSA 11-02			
L11-02-05-P-R-S-00	4/25/2016	10:50	S	C	X		X	X								1	LSA 11-02			
L11-02-05-P-R-Q-00	4/25/2016	10:50	S	C	X		X	X								1	LSA 11-02			
L11-02-07-P-S-S-00	4/25/2016	13:00	S	G	X		X	X								1	LSA 11-02			
L11-02-08-P-R-S-00	4/25/2016	13:18	S	C	X		X	X								1	LSA 11-02			
L11-02-10-P-S-S-00	4/25/2016	13:30	S	G	X		X	X								1	LSA 11-02			
L11-02-11-P-R-S-00	4/25/2016	13:43	S	C	X		X	X								1	LSA 11-02			
L11-02-13-P-S-S-00	4/25/2016	13:55	S	G	X		X	X								1	LSA 11-02			
L11-02-14-P-R-S-00	4/25/2016	14:13	S	C	X		X	X								1	LSA 11-02			
L11-02-16-P-S-S-00	4/25/2016	14:40	S	G	X		X	X								1	LSA 11-02			
Relinquished by: <i>Gorsum</i>		Date/Time: 4-26-16		Received by: <i>RGAH 3815</i>		Date/Time: 4-26-16		Total: 18		Cooler Temperature: Ambient										
Company Name: <i>WEC</i>		0915		Company Name: <i>CROSSROADS</i>		0915		Cooler ID: 0425-02/03		Shipper and Number:										
Received by:		Date/Time:		Relinquished by:		Date/Time:		Comments: N/A												
Company Name:				Company Name:																
Relinquished by: <i>RGAH 3815</i>		Date/Time: 4-26-16		Received by: <i>Clark</i>		Date/Time: 4-26-16		Verified By: <i>C. Gorsum</i>												
Company Name: <i>CROSSROADS</i>		10:45		Company Name: <i>TAOR</i>		1045		<i>Clark</i> 4-26-16												

160-17119 Chain of Custody



Hematite Decommissioning Project

Procedure HDP-PR-QA-006, Chain of Custody  
 Revision: 4  
 Westinghouse Non-Proprietary Class 3  
 Page 1 of 1

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-042616-05 Page 2/2				Requested Analysis										Laboratory Name:		
Project Name: Westinghouse Electric Company				Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Po-99	Gamma Spec (21 day ingrow for Ra-226)							Total Containers	Laboratory Address: 13715 Rider Trail North
Contact Person: Clark Evers																Laboratory Contact Person: Ivan Vania
Phone Number: 314-810-3336															Phone No. 314-298-8566	
Sampler Name John Michel															Laboratory Contact Person: Ivan Vania	
															Phone No. 708-870-8453	
															Turn Around Time Rush (7 days)	
															Remarks	
Sample ID	Date	Time	Matrix													
L11-02-17-P-R-S-00	4/25/2016	14:48	S	C	X		X	X							1 LSA 11-02	
L11-02-17-P-R-Q-00	4/25/2016	14:48	S	C	X		X	X							1 LSA 11-02	
L11-02-19-P-S-S-00	4/25/2016	14:56	S	G	X		X	X							1 LSA 11-02	
L11-02-20-P-R-S-00	4/25/2016	15:04	S	C	X		X	X							1 LSA 11-02	
L11-02-22-P-S-S-00	4/25/2016	15:09	S	G	X		X	X							1 LSA 11-02	
L11-02-23-P-R-S-00	4/25/2016	15:23	S	C	X		X	X							1 LSA 11-02	

Relinquished by: <i>Gorsun</i> <i>CMP</i>	Date/Time 4-26-16 0915	Received by: <i>RC 3815</i>	Date/Time 4-26-16 0915	Total 18	Cooler Temperature: Ambient
Company Name: <i>WEC</i>		Company Name: <i>CROSSROADS</i>		Cooler ID: 0425-02/03	Shipper and Number:
Received by:	Date/Time	Relinquished by:	Date/Time	Comments: N/A	
Company Name:		Company Name:			
Relinquished by: <i>RC 3815</i>	Date/Time 4-26-16 10:45	Received by: <i>Clark</i>	Date/Time 4-26-16 1045	Verified By: <i>C. Gorsun</i> <i>CMP</i> 4-26-16	
Company Name: <i>Crossroads</i>		Company Name: <i>TA SR</i>			



# Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-17119-2

**Login Number: 17119**

**List Source: TestAmerica St. Louis**

**List Number: 1**

**Creator: Clarke, Jill C**

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: 160-17119-2

## Qualifiers

### 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.
▫	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: 160-17119-2

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

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

TestAmerica Job ID: 160-17119-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17119-1	L11-02-01-P-S-S-00	Solid	04/25/16 10:00	04/26/16 10:45
160-17119-2	L11-02-02-P-R-S-00	Solid	04/25/16 10:10	04/26/16 10:45
160-17119-3	L11-02-04-P-S-S-00	Solid	04/25/16 10:35	04/26/16 10:45
160-17119-4	L11-02-05-P-R-S-00	Solid	04/25/16 10:50	04/26/16 10:45
160-17119-5	L11-02-05-P-R-Q-00	Solid	04/25/16 10:50	04/26/16 10:45
160-17119-6	L11-02-07-P-S-S-00	Solid	04/25/16 13:00	04/26/16 10:45
160-17119-7	L11-02-08-P-R-S-00	Solid	04/25/16 13:18	04/26/16 10:45
160-17119-8	L11-02-10-P-S-S-00	Solid	04/25/16 13:30	04/26/16 10:45
160-17119-9	L11-02-11-P-R-S-00	Solid	04/25/16 13:43	04/26/16 10:45
160-17119-10	L11-02-13-P-S-S-00	Solid	04/25/16 13:55	04/26/16 10:45
160-17119-11	L11-02-14-P-R-S-00	Solid	04/25/16 14:13	04/26/16 10:45
160-17119-12	L11-02-16-P-S-S-00	Solid	04/25/16 14:40	04/26/16 10:45
160-17119-13	L11-02-17-P-R-S-00	Solid	04/25/16 14:48	04/26/16 10:45
160-17119-14	L11-02-17-P-R-Q-00	Solid	04/25/16 14:48	04/26/16 10:45
160-17119-15	L11-02-19-P-S-S-00	Solid	04/25/16 14:56	04/26/16 10:45
160-17119-16	L11-02-20-P-R-S-00	Solid	04/25/16 15:04	04/26/16 10:45
160-17119-17	L11-02-22-P-S-S-00	Solid	04/25/16 15:09	04/26/16 10:45
160-17119-18	L11-02-23-P-R-S-00	Solid	04/25/16 15:23	04/26/16 10:45

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-01-P-S-S-00**

**Lab Sample ID: 160-17119-1**

Date Collected: 04/25/16 10:00

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.780		0.150	0.170		0.147	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Bismuth 212	1.11		0.435	0.450		0.421	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Bismuth 214	1.05		0.119	0.162		0.0658	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Lead 212	0.671		0.0718	0.113		0.0707	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Lead 214	1.04		0.108	0.153		0.0713	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Potassium 40	12.8		1.17	1.76		0.328	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Protactinium 231	-0.510	U	1.59	1.59		2.66	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Radium 226	1.05		0.119	0.162	1.00	0.0658	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Thorium 232	0.780		0.150	0.170		0.147	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Thorium 234	1.14		0.535	0.548		0.828	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Uranium 235	-0.107	U	0.185	0.185		0.534	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Americium 241	0.0372	U	0.0829	0.0830		0.110	pCi/g	04/28/16 09:06	05/23/16 08:38	1
Protactinium 234m	-4.01	U	6.28	6.30		10.6	pCi/g	04/28/16 09:06	05/23/16 08:38	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>						
<i>Tl-208</i>	0.270		0.0500	0.0573		0.0345	pCi/g	04/28/16 09:06	05/23/16 08:38	1

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

**Lab Sample ID: 160-17119-2**

Date Collected: 04/25/16 10:10

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.11		0.139	0.180		0.114	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Bismuth 212	1.03		0.415	0.428		0.414	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Bismuth 214	1.16		0.144	0.188		0.0964	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Lead 212	0.965		0.0816	0.149		0.0766	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Lead 214	1.25		0.116	0.174		0.101	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Potassium 40	16.8		1.33	2.17		0.431	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Protactinium 231	0.424	U	1.28	1.28		2.68	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Radium 226	1.16		0.144	0.188	1.00	0.0964	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Thorium 232	1.11		0.139	0.180		0.114	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Thorium 234	1.23		0.570	0.584		0.890	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Uranium 235	-0.114	U	0.196	0.196		0.603	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Americium 241	0.0224	U	0.0931	0.0931		0.124	pCi/g	04/28/16 09:06	05/20/16 10:14	1
Protactinium 234m	5.31	U	6.76	6.79		9.74	pCi/g	04/28/16 09:06	05/20/16 10:14	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>						
<i>Tl-208</i>	0.297		0.0551	0.0632		0.0438	pCi/g	04/28/16 09:06	05/20/16 10:14	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-04-P-S-S-00**

**Lab Sample ID: 160-17119-3**

Date Collected: 04/25/16 10:35

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.929		0.145	0.173		0.0755	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Bismuth 212	0.925		0.327	0.341		0.304	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Bismuth 214	0.926		0.118	0.152		0.0859	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Lead 212	0.884		0.0766	0.138		0.0677	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Lead 214	1.01		0.108	0.151		0.0843	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Potassium 40	17.7		1.31	2.24		0.393	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Protactinium 231	-0.452	U	1.24	1.24		2.07	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Radium 226	0.926		0.118	0.152	1.00	0.0859	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Thorium 232	0.929		0.145	0.173		0.0755	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Thorium 234	1.03		0.498	0.509		0.770	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Uranium 235	0.00530	U	0.0611	0.0611		0.396	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Americium 241	-0.0365	U	0.0816	0.0817		0.115	pCi/g	04/28/16 09:06	05/20/16 10:49	1
Protactinium 234m	2.92	U	4.66	4.66		6.69	pCi/g	04/28/16 09:06	05/20/16 10:49	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0521</i>	<i>0.0604</i>		<i>0.0396</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 10:49</i>	<i>1</i>

**Client Sample ID: L11-02-05-P-R-S-00**

**Lab Sample ID: 160-17119-4**

Date Collected: 04/25/16 10:50

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.02		0.137	0.172		0.123	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Bismuth 212	1.29		0.510	0.527		0.458	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Bismuth 214	0.905		0.119	0.152		0.0864	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Lead 212	0.995		0.0791	0.151		0.0697	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Lead 214	1.04		0.0986	0.146		0.0901	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Potassium 40	16.8		1.23	2.11		0.167	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Protactinium 231	-0.511	U	1.52	1.52		2.54	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Radium 226	0.905		0.119	0.152	1.00	0.0864	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Thorium 232	1.02		0.137	0.172		0.123	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Thorium 234	1.03		0.335	0.352		0.927	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Uranium 235	-0.0128	U	0.0172	0.0173		0.566	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Americium 241	0.0159	U	0.109	0.109		0.182	pCi/g	04/28/16 09:06	05/20/16 10:50	1
Protactinium 234m	2.43	U	4.44	4.45		8.93	pCi/g	04/28/16 09:06	05/20/16 10:50	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0646</i>	<i>0.0733</i>		<i>0.0519</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 10:50</i>	<i>1</i>

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-05-P-R-Q-00**

**Lab Sample ID: 160-17119-5**

Date Collected: 04/25/16 10:50

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.03		0.118	0.157		0.0910	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Bismuth 212	1.65		0.472	0.501		0.669	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Bismuth 214	0.797		0.0854	0.118		0.0593	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Lead 212	1.04		0.0674	0.151		0.0575	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Lead 214	0.910		0.0777	0.123		0.0668	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Potassium 40	18.7		1.04	2.16		0.252	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Protactinium 231	0.000	U	0.407	0.407		1.99	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Radium 226	0.797		0.0854	0.118	1.00	0.0593	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Thorium 232	1.03		0.118	0.157		0.0910	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Thorium 234	0.766		0.262	0.274		0.722	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Uranium 235	0.141	U	0.124	0.125		0.166	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Americium 241	0.0267	U	0.0849	0.0849		0.141	pCi/g	04/28/16 09:06	05/20/16 10:52	1
Protactinium 234m	3.34	U	3.72	3.74		6.65	pCi/g	04/28/16 09:06	05/20/16 10:52	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0463</i>	<i>0.0584</i>		<i>0.0323</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 10:52</i>	<i>1</i>

**Client Sample ID: L11-02-07-P-S-S-00**

**Lab Sample ID: 160-17119-6**

Date Collected: 04/25/16 13:00

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.912		0.110	0.144		0.109	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Bismuth 212	1.30		0.411	0.433		0.355	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Bismuth 214	0.896		0.100	0.137		0.0705	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Lead 212	0.892		0.0697	0.135		0.0599	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Lead 214	1.01		0.0852	0.136		0.0694	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Potassium 40	19.0		1.18	2.28		0.327	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Protactinium 231	-0.449	U	1.41	1.41		2.35	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Radium 226	0.896		0.100	0.137	1.00	0.0705	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Thorium 232	0.912		0.110	0.144		0.109	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Thorium 234	0.870		0.301	0.314		0.840	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Uranium 235	0.120	U	0.124	0.124		0.179	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Americium 241	-0.0467	U	0.0506	0.0509		0.175	pCi/g	04/28/16 09:06	05/20/16 11:31	1
Protactinium 234m	3.13	U	4.60	4.61		6.65	pCi/g	04/28/16 09:06	05/20/16 11:31	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0479</i>	<i>0.0576</i>		<i>0.0362</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 11:31</i>	<i>1</i>

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-08-P-R-S-00**

**Lab Sample ID: 160-17119-7**

Date Collected: 04/25/16 13:18

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.05		0.131	0.170		0.113	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Bismuth 212	1.07		0.451	0.464		0.441	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Bismuth 214	0.961		0.109	0.148		0.0705	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Lead 212	0.935		0.0760	0.143		0.0696	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Lead 214	1.01		0.104	0.148		0.0794	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Potassium 40	18.0		1.23	2.22		0.249	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Protactinium 231	-0.436	U	1.25	1.25		2.09	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Radium 226	0.961		0.109	0.148	1.00	0.0705	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Thorium 232	1.05		0.131	0.170		0.113	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Thorium 234	0.966		0.320	0.335		0.840	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Uranium 235	0.105	U	0.0952	0.0958		0.180	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Americium 241	0.00209	U	0.0785	0.0785		0.111	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Protactinium 234m	1.86	U	3.17	3.18		11.2	pCi/g	04/28/16 09:06	05/20/16 11:33	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Pb-210	1.65		0.641	0.669		0.784	pCi/g	04/28/16 09:06	05/20/16 11:33	1
Tl-208	0.368		0.0541	0.0662		0.0400	pCi/g	04/28/16 09:06	05/20/16 11:33	1

**Client Sample ID: L11-02-10-P-S-S-00**

**Lab Sample ID: 160-17119-8**

Date Collected: 04/25/16 13:30

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.580		0.106	0.121		0.0691	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Bismuth 212	0.894		0.335	0.348		0.422	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Bismuth 214	0.701		0.0986	0.123		0.0632	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Lead 212	0.524		0.0568	0.0884		0.0501	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Lead 214	0.765		0.0876	0.118		0.0665	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Potassium 40	9.53		0.969	1.37		0.319	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Protactinium 231	0.377	U	0.883	0.884		1.99	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Radium 226	0.701		0.0986	0.123	1.00	0.0632	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Thorium 232	0.580		0.106	0.121		0.0691	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Thorium 234	0.846		0.263	0.278		0.709	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Uranium 235	-0.119	U	0.172	0.172		0.575	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Americium 241	0.0195	U	0.0813	0.0813		0.136	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Protactinium 234m	2.10	U	3.86	3.87		6.94	pCi/g	04/28/16 09:06	05/20/16 11:34	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Pb-210	1.78		0.537	0.576		0.645	pCi/g	04/28/16 09:06	05/20/16 11:34	1
Tl-208	0.176		0.0362	0.0406		0.0279	pCi/g	04/28/16 09:06	05/20/16 11:34	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-11-P-R-S-00**

**Lab Sample ID: 160-17119-9**

Date Collected: 04/25/16 13:43

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.11		0.137	0.177		0.100	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Bismuth 212	1.49		0.410	0.438		0.329	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Bismuth 214	0.923		0.0992	0.137		0.0663	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Lead 212	1.11		0.0663	0.159		0.0516	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Lead 214	1.04		0.0935	0.143		0.0666	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Potassium 40	18.4		1.02	2.11		0.289	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Protactinium 231	-0.259	U	1.24	1.24		2.07	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Radium 226	0.923		0.0992	0.137	1.00	0.0663	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Thorium 232	1.11		0.137	0.177		0.100	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Thorium 234	0.920		0.301	0.316		0.728	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Uranium 235	-0.0455	U	0.125	0.125		0.532	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Americium 241	0.0275	U	0.0787	0.0787		0.131	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Protactinium 234m	0.0445	U	0.0474	0.0476		8.95	pCi/g	04/28/16 09:06	05/20/16 11:36	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Pb-210	1.75		0.663	0.694		0.747	pCi/g	04/28/16 09:06	05/20/16 11:36	1
Tl-208	0.344		0.0432	0.0559		0.0322	pCi/g	04/28/16 09:06	05/20/16 11:36	1

**Client Sample ID: L11-02-13-P-S-S-00**

**Lab Sample ID: 160-17119-10**

Date Collected: 04/25/16 13:55

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.933		0.113	0.144		0.0826	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Bismuth 212	0.970		0.362	0.374		0.330	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Bismuth 214	0.866		0.0897	0.123		0.0575	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Lead 212	0.873		0.0720	0.118		0.0643	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Lead 214	1.01		0.0980	0.138		0.0800	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Potassium 40	15.3		1.07	1.82		0.244	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Protactinium 231	0.000	U	0.428	0.428		2.24	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Radium 226	0.866		0.0897	0.123	1.00	0.0575	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Thorium 232	0.933		0.113	0.144		0.0826	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Thorium 234	1.09		0.491	0.502		0.762	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Uranium 235	0.186	U	0.170	0.170		0.202	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Americium 241	-0.0428	U	0.0506	0.0507		0.159	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Protactinium 234m	3.31	U	4.63	4.64		7.55	pCi/g	04/28/16 09:06	05/20/16 12:05	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Pb-210	1.59		0.489	0.531		0.609	pCi/g	04/28/16 09:06	05/20/16 12:05	1
Tl-208	0.280		0.0387	0.0473		0.0255	pCi/g	04/28/16 09:06	05/20/16 12:05	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-14-P-R-S-00**

**Lab Sample ID: 160-17119-11**

Date Collected: 04/25/16 14:13

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.06		0.137	0.174		0.129	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Bismuth 212	1.47		0.461	0.485		0.405	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Bismuth 214	1.19		0.116	0.170		0.0716	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Lead 212	1.06		0.0749	0.156		0.0619	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Lead 214	1.23		0.0947	0.159		0.0769	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Potassium 40	19.5		1.27	2.36		0.357	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Protactinium 231	-0.438	U	1.28	1.28		2.14	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Radium 226	1.19		0.116	0.170	1.00	0.0716	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Thorium 232	1.06		0.137	0.174		0.129	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Thorium 234	-0.427	U	0.538	0.540		1.22	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Uranium 235	0.116	U	0.223	0.224		0.386	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Americium 241	-0.0193	U	0.0820	0.0820		0.116	pCi/g	04/28/16 09:06	05/20/16 12:06	1
Protactinium 234m	3.18	U	4.89	4.90		6.76	pCi/g	04/28/16 09:06	05/20/16 12:06	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0565</i>	<i>0.0723</i>		<i>0.0370</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 12:06</i>	<i>1</i>

**Client Sample ID: L11-02-16-P-S-S-00**

**Lab Sample ID: 160-17119-12**

Date Collected: 04/25/16 14:40

Matrix: Solid

Date Received: 04/26/16 10:45

**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	0.946		0.130	0.162		0.115	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Bismuth 212	1.27		0.413	0.434		0.387	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Bismuth 214	1.04		0.111	0.155		0.0694	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Lead 212	0.971		0.0748	0.146		0.0650	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Lead 214	1.19		0.0978	0.157		0.0925	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Potassium 40	16.1		1.22	2.05		0.385	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Protactinium 231	-0.523	U	1.55	1.55		2.58	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Radium 226	1.04		0.111	0.155	1.00	0.0694	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Thorium 232	0.946		0.130	0.162		0.115	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Thorium 234	0.910		0.307	0.321		0.832	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Uranium 235	0.108	U	0.187	0.187		0.557	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Americium 241	0.0439	U	0.102	0.102		0.169	pCi/g	04/28/16 09:06	05/20/16 12:08	1
Protactinium 234m	-4.68	U	5.53	5.55		12.6	pCi/g	04/28/16 09:06	05/20/16 12:08	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>Tl-208</i>			<i>0.0509</i>	<i>0.0588</i>		<i>0.0396</i>	<i>pCi/g</i>	<i>04/28/16 09:06</i>	<i>05/20/16 12:08</i>	<i>1</i>

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-17-P-R-S-00**

**Lab Sample ID: 160-17119-13**

Date Collected: 04/25/16 14:48

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.24		0.140	0.187		0.118	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Bismuth 212	1.18		0.372	0.391		0.364	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Bismuth 214	1.25		0.117	0.173		0.0757	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Lead 212	1.20		0.0721	0.172		0.0595	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Lead 214	1.47		0.102	0.184		0.0747	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Potassium 40	21.7		1.15	2.46		0.316	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Protactinium 231	-0.483	U	1.44	1.45		2.40	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Radium 226	1.25		0.117	0.173	1.00	0.0757	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Thorium 232	1.24		0.140	0.187		0.118	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Thorium 234	1.26		0.502	0.519		0.783	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Uranium 235	0.181	U	0.126	0.127		0.194	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Americium 241	0.0449	U	0.0489	0.0491		0.0801	pCi/g	04/28/16 09:06	05/20/16 12:10	1
Protactinium 234m	2.46	U	4.37	4.38		7.31	pCi/g	04/28/16 09:06	05/20/16 12:10	1
<b>Other Detected Radionuclides</b>			<b>Count</b>	<b>Total</b>						
	<b>Result</b>	<b>Qualifier</b>	<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
TI-208	0.431		0.0596	0.0742		0.0434	pCi/g	04/28/16 09:06	05/20/16 12:10	1

**Client Sample ID: L11-02-17-P-R-Q-00**

**Lab Sample ID: 160-17119-14**

Date Collected: 04/25/16 14:48

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.21		0.157	0.200		0.153	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Bismuth 212	1.59		0.695	0.715		0.594	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Bismuth 214	1.20		0.146	0.193		0.101	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Lead 212	1.03		0.0816	0.157		0.0760	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Lead 214	1.29		0.133	0.189		0.0969	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Potassium 40	18.3		1.38	2.33		0.510	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Protactinium 231	0.000	U	0.391	0.391		2.63	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Radium 226	1.20		0.146	0.193	1.00	0.101	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Thorium 232	1.21		0.157	0.200		0.153	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Thorium 234	0.774	U	0.332	0.341		0.935	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Uranium 235	0.0999	U	0.354	0.354		0.588	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Americium 241	-0.0470	U	0.0759	0.0760		0.138	pCi/g	04/28/16 09:06	05/20/16 12:00	1
Protactinium 234m	4.01	U	6.02	6.03		8.97	pCi/g	04/28/16 09:06	05/20/16 12:00	1
<b>Other Detected Radionuclides</b>			<b>Count</b>	<b>Total</b>						
	<b>Result</b>	<b>Qualifier</b>	<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
TI-208	0.381		0.0567	0.0691		0.0421	pCi/g	04/28/16 09:06	05/20/16 12:00	1

TestAmerica St. Louis



# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-19-P-S-S-00**

**Lab Sample ID: 160-17119-15**

Date Collected: 04/25/16 14:56

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.13		0.130	0.173		0.145	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Bismuth 212	1.08		0.329	0.348		0.424	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Bismuth 214	1.04		0.0920	0.141		0.0649	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Lead 212	1.08		0.0704	0.157		0.0572	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Lead 214	1.19		0.0903	0.153		0.0710	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Potassium 40	19.7		1.13	2.29		0.330	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Protactinium 231	0.429	U	1.01	1.01		2.23	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Radium 226	1.04		0.0920	0.141	1.00	0.0649	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Thorium 232	1.13		0.130	0.173		0.145	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Thorium 234	1.41		0.515	0.536		0.794	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Uranium 235	-0.0144	U	0.0252	0.0252		0.530	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Americium 241	0.0173	U	0.0962	0.0962		0.160	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Protactinium 234m	1.29	U	2.59	2.59		8.63	pCi/g	04/28/16 09:06	05/20/16 12:47	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Pb-210	1.86		0.600	0.638		0.748	pCi/g	04/28/16 09:06	05/20/16 12:47	1
Tl-208	0.391		0.0484	0.0629		0.0346	pCi/g	04/28/16 09:06	05/20/16 12:47	1

**Client Sample ID: L11-02-20-P-R-S-00**

**Lab Sample ID: 160-17119-16**

Date Collected: 04/25/16 15:04

Matrix: Solid

Date Received: 04/26/16 10:45

**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	1.04		0.112	0.155		0.106	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Bismuth 212	1.01		0.287	0.305		0.359	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Bismuth 214	0.938		0.0919	0.134		0.0613	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Lead 212	1.02		0.0656	0.148		0.0557	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Lead 214	1.09		0.0780	0.137		0.0523	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Potassium 40	19.0		1.06	2.22		0.362	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Protactinium 231	-0.432	U	1.32	1.32		2.20	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Radium 226	0.938		0.0919	0.134	1.00	0.0613	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Thorium 232	1.04		0.112	0.155		0.106	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Thorium 234	1.19		0.490	0.505		0.765	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Uranium 235	0.000	U	0.104	0.104		0.495	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Americium 241	0.0306	U	0.0905	0.0906		0.150	pCi/g	04/28/16 09:06	05/20/16 12:40	1
Protactinium 234m	1.62	U	2.73	2.74		7.11	pCi/g	04/28/16 09:06	05/20/16 12:40	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
Tl-208	0.384		0.0504	0.0643		0.0361	pCi/g	04/28/16 09:06	05/20/16 12:40	1

TestAmerica St. Louis

# Client Sample Results

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

TestAmerica Job ID: 160-17119-2

**Client Sample ID: L11-02-22-P-S-S-00**

**Lab Sample ID: 160-17119-17**

Date Collected: 04/25/16 15:09

Matrix: Solid

Date Received: 04/26/16 10:45

**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+/-)						
<b>Actinium 228</b>	<b>0.837</b>		0.111	0.140		0.0942	pCi/g	04/28/16 09:06	05/20/16 12:41	1
Bismuth 212	0.156	U	0.509	0.510		0.872	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Bismuth 214</b>	<b>0.906</b>		0.126	0.158		0.0927	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Lead 212</b>	<b>0.716</b>		0.0763	0.120		0.0752	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Lead 214</b>	<b>1.16</b>		0.107	0.162		0.0896	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Potassium 40</b>	<b>13.4</b>		1.19	1.81		0.308	pCi/g	04/28/16 09:06	05/20/16 12:41	1
Protactinium 231	0.232	U	0.673	0.674		2.18	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Radium 226</b>	<b>0.906</b>		0.126	0.158	1.00	0.0927	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Thorium 232</b>	<b>0.837</b>		0.111	0.140		0.0942	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Thorium 234</b>	<b>1.18</b>		0.563	0.576		0.871	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Uranium 235</b>	<b>0.257</b>		0.149	0.151		0.188	pCi/g	04/28/16 09:06	05/20/16 12:41	1
Americium 241	-0.0375	U	0.0837	0.0838		0.118	pCi/g	04/28/16 09:06	05/20/16 12:41	1
Protactinium 234m	2.21	U	4.06	4.06		9.33	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
<i>Pb-210</i>			0.674	0.718		0.835	pCi/g	04/28/16 09:06	05/20/16 12:41	1
<i>Tl-208</i>			0.0523	0.0580		0.0410	pCi/g	04/28/16 09:06	05/20/16 12:41	1

**Client Sample ID: L11-02-23-P-R-S-00**

**Lab Sample ID: 160-17119-18**

Date Collected: 04/25/16 15:23

Matrix: Solid

Date Received: 04/26/16 10:45

**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+/-)						
<b>Actinium 228</b>	<b>0.956</b>		0.141	0.171		0.140	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Bismuth 212</b>	<b>1.52</b>		0.430	0.458		0.349	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Bismuth 214</b>	<b>1.01</b>		0.102	0.146		0.0656	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Lead 212</b>	<b>1.03</b>		0.0760	0.153		0.0596	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Lead 214</b>	<b>1.14</b>		0.117	0.167		0.0867	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Potassium 40</b>	<b>17.2</b>		1.22	2.14		0.161	pCi/g	04/28/16 09:06	05/20/16 12:43	1
Protactinium 231	0.000	U	0.430	0.430		2.57	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Radium 226</b>	<b>1.01</b>		0.102	0.146	1.00	0.0656	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Thorium 232</b>	<b>0.956</b>		0.141	0.171		0.140	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Thorium 234</b>	<b>1.19</b>		0.547	0.561		0.856	pCi/g	04/28/16 09:06	05/20/16 12:43	1
Uranium 235	-0.138	U	0.203	0.204		0.638	pCi/g	04/28/16 09:06	05/20/16 12:43	1
Americium 241	-0.0464	U	0.111	0.111		0.184	pCi/g	04/28/16 09:06	05/20/16 12:43	1
Protactinium 234m	3.23	U	4.90	4.92		8.58	pCi/g	04/28/16 09:06	05/20/16 12:43	1
<b>Other Detected</b>			<b>Count</b>	<b>Total</b>						
<b>Radionuclides</b>			<b>Uncert.</b>	<b>Uncert.</b>	<b>RL</b>	<b>MDC</b>	<b>Unit</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
			(2σ+/-)	(2σ+/-)						
<i>Tl-208</i>			0.0506	0.0601		0.0391	pCi/g	04/28/16 09:06	05/20/16 12:43	1

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-17119-2

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

**Lab Sample ID: MB 160-248510/1-A**  
**Matrix: Solid**  
**Analysis Batch: 252101**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 248510**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.02987	U	0.0238	0.0240		0.0322	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Bismuth 212	0.05513	U	0.234	0.234		0.412	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Bismuth 214	0.01321	U	0.0400	0.0400		0.0693	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Lead 212	0.004294	U	0.0181	0.0181		0.0311	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Lead 214	-0.0002914	U	0.00371	0.00371		0.0457	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Potassium 40	-0.07123	U	0.230	0.231		0.217	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Protactinium 231	0.05308	U	0.200	0.200		0.678	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Radium 226	0.01321	U	0.0400	0.0400	1.00	0.0693	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Thorium 232	0.02987	U	0.0238	0.0240		0.0322	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Thorium 234	0.1017	U	0.200	0.200		0.332	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Uranium 235	0.008292	U	0.0207	0.0207		0.121	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Americium 241	-0.006408	U	0.0198	0.0199		0.0291	pCi/g	04/28/16 09:06	05/20/16 10:10	1
Protactinium 234m	-0.1440	U	1.01	1.01		3.24	pCi/g	04/28/16 09:06	05/20/16 10:10	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	04/28/16 09:06	05/20/16 10:10	1

**Lab Sample ID: LCS 160-248510/2-A**  
**Matrix: Solid**  
**Analysis Batch: 252102**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 248510**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Americium 241	101	96.67		10.1		0.403	pCi/g	96	87 - 116
Cesium 137	34.0	30.21		3.18		0.204	pCi/g	89	87 - 120
Cobalt 60	31.2	27.73		2.81		0.150	pCi/g	89	87 - 115

**Lab Sample ID: 160-17119-1 DU**  
**Matrix: Solid**  
**Analysis Batch: 252551**

**Client Sample ID: L11-02-01-P-S-S-00**  
**Prep Type: Total/NA**  
**Prep Batch: 248510**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total	RL	MDC	Unit	RER	RER Limit
					Uncert. (2σ+/-)					
Actinium 228	0.780		0.7912		0.129		0.0845	pCi/g	0.04	1
Bismuth 212	1.11		1.003		0.371		0.316	pCi/g	0.13	1
Bismuth 214	1.05		0.9581		0.138		0.0631	pCi/g	0.30	1
Lead 212	0.671		0.7518		0.115		0.0569	pCi/g	0.35	1
Lead 214	1.04		1.085		0.137		0.0643	pCi/g	0.16	1
Potassium 40	12.8		15.00		1.80		0.273	pCi/g	0.61	1
Protactinium 231	-0.510	U	0.2073	U	0.625		1.99	pCi/g	0.32	1
Radium 226	1.05		0.9581		0.138	1.00	0.0631	pCi/g	0.30	1
Thorium 232	0.780		0.7912		0.129		0.0845	pCi/g	0.04	1
Thorium 234	1.14		1.351		0.503		0.739	pCi/g	0.20	1
Uranium 235	-0.107	U	-0.04557	U	0.110		0.538	pCi/g	0.21	1
Americium 241	0.0372	U	0.001115	U	0.0883		0.148	pCi/g	0.21	1

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-17119-2

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

Lab Sample ID: 160-17119-1 DU  
 Matrix: Solid  
 Analysis Batch: 252551

Client Sample ID: L11-02-01-P-S-S-00  
 Prep Type: Total/NA  
 Prep Batch: 248510

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Protactinium 234m	-4.01	U	0.5689	U	2.87		8.64	pCi/g	0.50	1

Other Detected Radionuclides	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Tl-208	0.270		0.2583		0.0539		0.0361	pCi/g	0.10	1



# QC Association Summary

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

TestAmerica Job ID: 160-17119-2

## Rad

### Leach Batch: 247971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17119-1	L11-02-01-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-1 DU	L11-02-01-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-2	L11-02-02-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-3	L11-02-04-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-4	L11-02-05-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-5	L11-02-05-P-R-Q-00	Total/NA	Solid	Dry and Grind	
160-17119-6	L11-02-07-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-7	L11-02-08-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-8	L11-02-10-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-9	L11-02-11-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-10	L11-02-13-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-11	L11-02-14-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-12	L11-02-16-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-13	L11-02-17-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-14	L11-02-17-P-R-Q-00	Total/NA	Solid	Dry and Grind	
160-17119-15	L11-02-19-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-16	L11-02-20-P-R-S-00	Total/NA	Solid	Dry and Grind	
160-17119-17	L11-02-22-P-S-S-00	Total/NA	Solid	Dry and Grind	
160-17119-18	L11-02-23-P-R-S-00	Total/NA	Solid	Dry and Grind	

### Prep Batch: 248510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17119-1	L11-02-01-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-1 DU	L11-02-01-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-2	L11-02-02-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-3	L11-02-04-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-4	L11-02-05-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-5	L11-02-05-P-R-Q-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-6	L11-02-07-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-7	L11-02-08-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-8	L11-02-10-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-9	L11-02-11-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-10	L11-02-13-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-11	L11-02-14-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-12	L11-02-16-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-13	L11-02-17-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-14	L11-02-17-P-R-Q-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-15	L11-02-19-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-16	L11-02-20-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-17	L11-02-22-P-S-S-00	Total/NA	Solid	Fill_Geo-21	247971
160-17119-18	L11-02-23-P-R-S-00	Total/NA	Solid	Fill_Geo-21	247971
LCS 160-248510/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
MB 160-248510/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	