

# 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: 160-17119-3

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



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Authorized for release by:  
5/5/2016 5:19:11 PM

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### LINKS

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**TotalAccess**

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[www.testamericainc.com](http://www.testamericainc.com)

*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: 160-17119-3

**Job ID: 160-17119-3**

**Laboratory: TestAmerica St. Louis**

**Narrative**

## CASE NARRATIVE

**Client: Westinghouse Electric Company LLC**

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

**Report Number: 160-17119-3**

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

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

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

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

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

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

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

### **RECEIPT**

The samples were received on 4/26/2016 10:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 19.0° C and 19.0° C.

### **TECHNETIUM-99 (ICPMS)**

Sample L11-02-10-P-S-S-00 (160-17119-8) was analyzed for Technetium-99 (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/03/2016 and analyzed on 05/05/2016.

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		Laboratory Contact Person: Ivan Vania		Phone No. 708-870-8453		Turn Around Time					
															Rush		(7 days)			
																	Remarks			
Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Gamma Spec	Isotopic Uranium	Tc-99	Gamma Spec (21 day ingrow for Ra-226)								Total Containers	Remarks			
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>C 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>		Cooler ID: 0425-02/03		Shipper and Number:				
Received by:		Date/Time:		Relinquished by:		Date/Time:		Comments: N/A		Company Name:		Company Name:		Company Name:		Company Name:				
Relinquished by: <i>RGAH 3815</i>		Date/Time: 4-26-16		Received by: <i>John Clark</i>		Date/Time: 4-26-16		Verified By: <i>C. Gorsum</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>				
Company Name: <i>CROSSROADS</i>		Date/Time: 10:45		Company Name: <i>TAOR</i>		Date/Time: 1045		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>		Company Name: <i>CROSSROADS</i>				

160-17119 Chain of Custody





# Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-17119-3

**Login Number: 17119**

**List Number: 1**

**Creator: Clarke, Jill C**

**List Source: TestAmerica St. Louis**

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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 <6mm (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: 160-17119-3

## 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: 160-17119-3

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS), Tc-99	SW846	TAL SL
6020A	Metals (ICP/MS), Tc-99 in Activity	SW846	TAL SL

**Protocol References:**

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

**Laboratory References:**

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

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# Sample Summary

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

TestAmerica Job ID: 160-17119-3

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17119-8	L11-02-10-P-S-S-00	Solid	04/25/16 13:30	04/26/16 10:45

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# Client Sample Results

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

TestAmerica Job ID: 160-17119-3

**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

Percent Solids: 75.9

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	0.0027		0.000075	0.000022	mg/Kg	☼	05/03/16 08:32	05/05/16 11:23	1

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	46.2		0.971	4.36	1.50	0.256	pCi/g	05/03/16 08:32	05/05/16 11:23	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Re	88		30 - 110	05/03/16 08:32	05/05/16 11:23	1

# QC Sample Results

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

TestAmerica Job ID: 160-17119-3

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

**Lab Sample ID: MB 160-248958/1-A**  
**Matrix: Solid**  
**Analysis Batch: 249620**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technetium 99	ND		0.000050	0.000015	mg/Kg		05/03/16 08:32	05/05/16 11:10	1

**Lab Sample ID: LCS 160-248958/2-A**  
**Matrix: Solid**  
**Analysis Batch: 249620**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Technetium 99	0.00118	0.00120		mg/Kg		101	80 - 120

**Lab Sample ID: LCSD 160-248958/3-A**  
**Matrix: Solid**  
**Analysis Batch: 249620**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Technetium 99	0.00119	0.00121		mg/Kg		102	80 - 120	1	20

**Lab Sample ID: 160-17119-8 DU**  
**Matrix: Solid**  
**Analysis Batch: 249620**

**Client Sample ID: L11-02-10-P-S-S-00**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Technetium 99	0.0027		0.00288		mg/Kg	☼	7	30

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

**Lab Sample ID: MB 160-248958/1-A**  
**Matrix: Solid**  
**Analysis Batch: 249621**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-0.003421	U	0.0213	0.0213	0.999	0.171	pCi/g	05/03/16 08:32	05/05/16 11:10	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Re	99		30 - 110					05/03/16 08:32	05/05/16 11:10	1

**Lab Sample ID: LCS 160-248958/2-A**  
**Matrix: Solid**  
**Analysis Batch: 249621**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	Limits
Technetium 99	20.3	20.53		1.97	0.983	0.168	pCi/g	101	80 - 120
Carrier	LCS %Yield	LCS Qualifier	Limits						
Re	101		30 - 110						

TestAmerica St. Louis

# QC Sample Results

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

TestAmerica Job ID: 160-17119-3

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

**Lab Sample ID: LCSD 160-248958/3-A**  
**Matrix: Solid**  
**Analysis Batch: 249621**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Technetium 99	20.4	20.79		2.00	0.999	0.171	pCi/g	102	80 - 120	0.07	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Re	100		30 - 110								

**Lab Sample ID: 160-17119-8 DU**  
**Matrix: Solid**  
**Analysis Batch: 249621**

**Client Sample ID: L11-02-10-P-S-S-00**  
**Prep Type: Total/NA**  
**Prep Batch: 248958**

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Technetium 99	46.2		49.36		4.55	1.52	0.260	pCi/g	0.35	1
<b>Carrier</b>	<b>%Yield</b>	<b>DU Qualifier</b>	<b>Limits</b>							
Re	86		30 - 110							

# QC Association Summary

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

TestAmerica Job ID: 160-17119-3

## Metals

### Prep Batch: 248958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17119-8	L11-02-10-P-S-S-00	Total/NA	Solid	None	
160-17119-8 DU	L11-02-10-P-S-S-00	Total/NA	Solid	None	
LCS 160-248958/2-A	Lab Control Sample	Total/NA	Solid	None	
LCSD 160-248958/3-A	Lab Control Sample Dup	Total/NA	Solid	None	
MB 160-248958/1-A	Method Blank	Total/NA	Solid	None	

### Analysis Batch: 249620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17119-8	L11-02-10-P-S-S-00	Total/NA	Solid	6020A	248958
160-17119-8 DU	L11-02-10-P-S-S-00	Total/NA	Solid	6020A	248958
LCS 160-248958/2-A	Lab Control Sample	Total/NA	Solid	6020A	248958
LCSD 160-248958/3-A	Lab Control Sample Dup	Total/NA	Solid	6020A	248958
MB 160-248958/1-A	Method Blank	Total/NA	Solid	6020A	248958

## Rad

### Prep Batch: 248958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17119-8	L11-02-10-P-S-S-00	Total/NA	Solid	None	
160-17119-8 DU	L11-02-10-P-S-S-00	Total/NA	Solid	None	
LCS 160-248958/2-A	Lab Control Sample	Total/NA	Solid	None	
LCSD 160-248958/3-A	Lab Control Sample Dup	Total/NA	Solid	None	
MB 160-248958/1-A	Method Blank	Total/NA	Solid	None	

# Tracer/Carrier Summary

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

TestAmerica Job ID: 160-17119-3

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

**Matrix: Solid**

**Prep Type: Total/NA**

## Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Re (30-110)
160-17119-8	L11-02-10-P-S-S-00	88
160-17119-8 DU	L11-02-10-P-S-S-00	86
LCS 160-248958/2-A	Lab Control Sample	101
LCSD 160-248958/3-A	Lab Control Sample Dup	100
MB 160-248958/1-A	Method Blank	99

### Tracer/Carrier Legend

Re = Re

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12