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: 160-17454-1
Client Project/Site: HDP RFP-CBA-022 (21 DAY TAT)

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

Attn: Mr. Martin Swanson

Authorized for release by:
6/27/2016 11:56:43 AM

Ivan Vania, Project Manager II
(314)298-8566
ivan.vania@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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Job ID: 160-17454-1

Laboratory: TestAmerica St. Louis

Narrative

Client: Westinghouse Electric Company LLC

Project: HDP RFP-CBA-022 (21 DAY TAT)

Report Number: 160-17454-1

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 sample was received on 5/19/2016 11:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 20.0º C.

RADIUM-226 (GFPC)-21 DAY INGROWTH

Sample 3970-EA-160519-00-01 (160-17454-1) was analyzed for Radium-226 (GFPC)-21 day ingrowth in accordance with EPA Method 903.0. The samples were prepared on 05/31/2016 and analyzed on 06/22/2016.

Preparation Batch 160-253972:
Insufficient sample volume was available to perform a sample duplicate (DUP) for sample 3970-EA-160519-00-01 (160-17454-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead. The sample was a filter that was dissolved and split between multiple analyses.

The method blank (MB) has radium-226 activity above the MDC and RL. The following associated samples are non-detect for the contaminant, therefore re-analysis is not required. The data have been qualified and reported. 3970-EA-160519-00-01 (160-17454-1), (LCS 160-253972/2-A), (LCSD 160-253972/3-A) and (MB 160-253972/1-A).

Job ID: 160-17454-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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

ISOTOPIC THORIUM (ALPHA SPECTROMETRY)
Sample 3970-EA-160519-00-01 (160-17454-1) was analyzed for Isotopic Thorium (Alpha Spectrometry) in accordance with A-01-R. The samples were prepared on 06/01/2016 and analyzed on 06/13/2016.

Preparation Batch 160-254002:
This filter sample was split among several analyses; an LCSD was prepared in batch 254002 to meet QC requirements.
3970-EA-160519-00-01 (160-17454-1)

Thorium-230 was detected in method blank MB 160-254002/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate.

The Laboratory Control Sample (LCS) spike recovery (129%) associated with the following sample is outside the upper QC limit of (81-118%) indicating a potential positive bias for that analyte : 3970-EA-160519-00-01 (160-17454-1), (LCS 160-254002/2-A), (LCSD 160-254002/3-A) and (MB 160-254002/1-A). This analyte was not observed above the requested limit in the associated samples; therefore the sample data was not adversely affected by this excursion. The data have been qualified and reported.

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

ISOTOPIC URANIUM (ALPHA SPECTROMETRY)
Sample 3970-EA-160519-00-01 (160-17454-1) was analyzed for Isotopic Uranium (Alpha Spectrometry) in accordance with A-01-R. The samples were prepared on 06/01/2016 and analyzed on 06/13/2016.

Preparation Batch 160-254004:
This filter sample was split among several analyses; an LCSD was prepared in batch 254004 to meet QC requirements.
3970-EA-160519-00-01 (160-17454-1)

Uranium 234 and Uranium 238 were detected in method blank MB 160-254004/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates.

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

TECHNETIUM-99 (LSC)
Sample 3970-EA-160519-00-01 (160-17454-1) was analyzed for Technetium-99 (LSC) in accordance with DOE Tc-02-RC. The samples were prepared on 06/01/2016 and analyzed on 06/06/2016.

Preparation Batch 160-254097:
This filter sample was split among several analyses; an LCSD was prepared in batch 254097 to meet QC requirements.
3970-EA-160519-00-01 (160-17454-1)

The detection goal of 1.00 pCi/Samples were not met for the following samples due to insufficient sample available for analysis.
3970-EA-160519-00-01 (160-17454-1) and (MB 160-254097/1-A). Analytical results are reported with the detection limit achieved.

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

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

FORM HDP-PR-QA-006-1
CHAIN OF CUSTODY

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

Chain of Cutody ID No. 051916-01 **Page** 1/1

Project Name: Westinghouse Electric Company

Contact Person: W. Clark Evers

Phone Number: 314-810-3336

Sampler Name: C. Gorski

Laboratory Name: TA-MO

Laboratory Address: 13715 Rider Trail North, Earth City, MO 63045

Phone No. 314-298-8566

Laboratory Contact Person: Ivan Vania

Phone No. 708-870-8453

Turn Around Time: Normal (21 days)

Sample ID	Date	Time	Matrix	Comp (C) or Grab (G)	Isotopic Uranium (filter)	Th-232 (filter)	Pb-210 (filter)	Ra-226 (filter)	Tc-99 (filter)						Total Containers	Remarks
3970-EA-160519-00-01	5/19/2016	7:30	F	C	X	X		X	X						1	BSA02-20 Comp

160-17454 Chain of Custody

Relinquished by:	Date/Time	Received by:	Date/Time	Total Number of Containers:	Cooler Temperature:
Gorski / Company Name: WEC	5-19-16 9:30	Company Name: CROSSROADS	5-19-16 9:30	1	Ambient
				Container ID: 0519-01	Shipper and Number:
Received by: / Company Name:	Date/Time	Relinquished by: / Company Name:	Date/Time	Comments: PO #4500404709	
Relinquished by: 3815 / Company Name: CROSS ROADS	Date/Time 5-19-16 11:30	Received by: / Company Name:	Date/Time 5-19-16 1130	Verified By: C. Gorski 5/19/16	

Login Sample Receipt Checklist

Client: Westinghouse Electric Company LLC

Job Number: 160-17454-1

Login Number: 17454
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 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
G	The Sample MDC is greater than the requested RL.
*	LCS or LCSD is outside acceptance limits.

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 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
A-01-R	Isotopic Thorium (Alpha Spectrometry)	DOE	TAL SL
A-01-R	Isotopic Uranium (Alpha Spectrometry)	DOE	TAL SL
TC-02-RC	Technetium-99 (LSC)	DOE	TAL SL

Protocol References:

DOE = U.S. Department of Energy
EPA = US Environmental Protection Agency

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 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17454-1	3970-EA-160519-00-01	Filter	05/19/16 07:30	05/19/16 11:30

Client Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Client Sample ID: 3970-EA-160519-00-01

Date Collected: 05/19/16 07:30
Date Received: 05/19/16 11:30

Lab Sample ID: 160-17454-1

Matrix: Filter

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.274	U	0.361	0.362	1.00	0.603	pCi/Sample	05/31/16 19:09	06/22/16 07:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.6*		*40 - 110*	*05/31/16 19:09*	*06/22/16 07:45*	*1*

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-232	0.0266	U	0.0367	0.0368	1.00	0.0570	pCi/Sample	06/01/16 08:50	06/13/16 12:42	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*85.8*		*30 - 110*	*06/01/16 08:50*	*06/13/16 12:42*	*1*

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 234	**0.491**		0.166	0.171	1.00	0.0763	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1
Uranium 235	0.000	U	0.0143	0.0143	1.00	0.0515	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1
Uranium 238	**0.193**		0.103	0.104	1.00	0.0413	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium 232	*66.2*		*30 - 110*	*06/01/16 08:50*	*06/13/16 12:45*	*1*

Method: TC-02-RC - Technetium-99 (LSC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-6.00	U G	4.07	4.11	1.00	7.21	pCi/Sample	06/01/16 10:37	06/24/16 02:00	1

Tracer	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tc-99m	*88.6*		*30 - 110*	*06/01/16 10:37*	*06/24/16 02:00*	*1*

QC Sample Results

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-253972/1-A
Matrix: Filter
Analysis Batch: 257502

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 253972

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.022		0.432	0.441	1.00	0.495	pCi/Sample	05/31/16 19:09	06/22/16 07:45	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.1*		*40 - 110*	*05/31/16 19:09*	*06/22/16 07:45*	*1*

Lab Sample ID: LCS 160-253972/2-A
Matrix: Filter
Analysis Batch: 257502

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 253972

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			74.4	80.52		7.88	1.00	0.503	pCi/Sam	108	65 - 140		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*86.9*		*40 - 110*

Lab Sample ID: LCSD 160-253972/3-A
Matrix: Filter
Analysis Batch: 257502

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 253972

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			74.4	82.89		8.11	1.00	0.499	pCi/Sam	111	65 - 140	0.15	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*86.9*		*40 - 110*

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Lab Sample ID: MB 160-254002/1-A
Matrix: Filter
Analysis Batch: 256227

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 254002

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Thorium-232	0.006574	U	0.0244	0.0244	1.00	0.0623	pCi/Sample	06/01/16 08:50	06/13/16 12:42	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Thorium-229	*78.8*		*30 - 110*	*06/01/16 08:50*	*06/13/16 12:42*	*1*

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCS 160-254002/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 256416 — **Prep Batch: 254002**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Thorium-230			8.03	10.33	*	1.10	1.00	0.0626	pCi/Sam	129	81 - 118		

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Thorium-229	*75.6*		*30 - 110*

Lab Sample ID: LCSD 160-254002/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 256418 — **Prep Batch: 254002**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Thorium-230			8.03	9.373		1.01	1.00	0.0599	pCi/Sam	117	81 - 118	0.45	1

Tracer	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Thorium-229	*82.0*		*30 - 110*

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Lab Sample ID: MB 160-254004/1-A — **Client Sample ID: Method Blank**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 256233 — **Prep Batch: 254004**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Uranium 234	0.05750		0.0575	0.0577	1.00	0.0431	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1
Uranium 235	0.0000	U	0.0149	0.0149	1.00	0.0537	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1
Uranium 238	0.04304		0.0497	0.0498	1.00	0.0430	pCi/Sample	06/01/16 08:50	06/13/16 12:45	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Uranium 232	*59.4*		*30 - 110*	*06/01/16 08:50*	*06/13/16 12:45*	*1*

Lab Sample ID: LCS 160-254004/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 256415 — **Prep Batch: 254004**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Uranium 234			12.7	13.14		1.36	1.00	0.0664	pCi/Sam	103	84 - 120		
Uranium 238			13.0	13.36		1.38	1.00	0.0663	pCi/Sam	103	82 - 122		

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Uranium 232	*75.8*		*30 - 110*

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry) (Continued)

Lab Sample ID: LCSD 160-254004/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 256235 — **Prep Batch: 254004**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Uranium 234			12.7	12.98		1.38	1.00	0.173	pCi/Sam	102	84 - 120	0.06	1
Uranium 238			13.0	13.52		1.42	1.00	0.0886	pCi/Sam	104	82 - 122	0.06	1

Tracer	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Uranium 232	*64.5*		*30 - 110*

Method: TC-02-RC - Technetium-99 (LSC)

Lab Sample ID: MB 160-254097/1-A — **Client Sample ID: Method Blank**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 257865 — **Prep Batch: 254097**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Technetium 99	-2.135	U G	3.56	3.56	1.00	6.02	pCi/Sample	06/01/16 10:37	06/23/16 20:15	1

Tracer	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tc-99m	*94.9*		*30 - 110*	*06/01/16 10:37*	*06/23/16 20:15*	*1*

Lab Sample ID: LCS 160-254097/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 257865 — **Prep Batch: 254097**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Technetium 99			1030	1038		101	1.00	7.09	pCi/Sam	101	75 - 125		

Tracer	*LCS %Yield*	*LCS Qualifier*	*Limits*
Tc-99m	*97.2*		*30 - 110*

Lab Sample ID: LCSD 160-254097/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Filter — **Prep Type: Total/NA**
Analysis Batch: 257865 — **Prep Batch: 254097**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Technetium 99			1030	1009		98.2	1.00	6.88	pCi/Sam	98	75 - 125	0.15	1

Tracer	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Tc-99m	*103*		*30 - 110*

QC Association Summary

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Rad

Prep Batch: 253972

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17454-1	3970-EA-160519-00-01	Total/NA	Filter	DPS-21	
LCS 160-253972/2-A	Lab Control Sample	Total/NA	Filter	DPS-21	
LCSD 160-253972/3-A	Lab Control Sample Dup	Total/NA	Filter	DPS-21	
MB 160-253972/1-A	Method Blank	Total/NA	Filter	DPS-21	

Prep Batch: 254002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17454-1	3970-EA-160519-00-01	Total/NA	Filter	ExtChrom	
LCS 160-254002/2-A	Lab Control Sample	Total/NA	Filter	ExtChrom	
LCSD 160-254002/3-A	Lab Control Sample Dup	Total/NA	Filter	ExtChrom	
MB 160-254002/1-A	Method Blank	Total/NA	Filter	ExtChrom	

Prep Batch: 254004

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17454-1	3970-EA-160519-00-01	Total/NA	Filter	ExtChrom	
LCS 160-254004/2-A	Lab Control Sample	Total/NA	Filter	ExtChrom	
LCSD 160-254004/3-A	Lab Control Sample Dup	Total/NA	Filter	ExtChrom	
MB 160-254004/1-A	Method Blank	Total/NA	Filter	ExtChrom	

Prep Batch: 254097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17454-1	3970-EA-160519-00-01	Total/NA	Filter	Ext_Chrom_LSC	
LCS 160-254097/2-A	Lab Control Sample	Total/NA	Filter	Ext_Chrom_LSC	
LCSD 160-254097/3-A	Lab Control Sample Dup	Total/NA	Filter	Ext_Chrom_LSC	
MB 160-254097/1-A	Method Blank	Total/NA	Filter	Ext_Chrom_LSC	

Tracer/Carrier Summary

Client: Westinghouse Electric Company LLC
Project/Site: HDP RFP-CBA-022 (21 DAY TAT)

TestAmerica Job ID: 160-17454-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Filter **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)						
Lab Sample ID	Client Sample ID	Ba (40-110)						
160-17454-1	3970-EA-160519-00-01	88.6						
LCS 160-253972/2-A	Lab Control Sample	86.9						
LCSD 160-253972/3-A	Lab Control Sample Dup	86.9						
MB 160-253972/1-A	Method Blank	82.1						

Tracer/Carrier Legend

Ba = Ba Carrier

Method: A-01-R - Isotopic Thorium (Alpha Spectrometry)

Matrix: Filter **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)						
Lab Sample ID	Client Sample ID	Th-229 (30-110)						
160-17454-1	3970-EA-160519-00-01	85.8						
LCS 160-254002/2-A	Lab Control Sample	75.6						
LCSD 160-254002/3-A	Lab Control Sample Dup	82.0						
MB 160-254002/1-A	Method Blank	78.8						

Tracer/Carrier Legend

Th-229 = Thorium-229

Method: A-01-R - Isotopic Uranium (Alpha Spectrometry)

Matrix: Filter **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)						
Lab Sample ID	Client Sample ID	U-232 (30-110)						
160-17454-1	3970-EA-160519-00-01	66.2						
LCS 160-254004/2-A	Lab Control Sample	75.8						
LCSD 160-254004/3-A	Lab Control Sample Dup	64.5						
MB 160-254004/1-A	Method Blank	59.4						

Tracer/Carrier Legend

U-232 = Uranium 232

Method: TC-02-RC - Technetium-99 (LSC)

Matrix: Filter **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)						
Lab Sample ID	Client Sample ID	Tc-99m (30-110)						
160-17454-1	3970-EA-160519-00-01	88.6						
LCS 160-254097/2-A	Lab Control Sample	97.2						
LCSD 160-254097/3-A	Lab Control Sample Dup	103						
MB 160-254097/1-A	Method Blank	94.9						

Tracer/Carrier Legend

Tc-99m = Tc-99m