From: Silko, Thomas B. [mailto:tsilko@entergy.com]
Sent: Thursday, August 11, 2016 11:26 AM
To: Parrott, Jack <Jack.Parrott@nrc.gov>
Subject: [External_Sender] Response to NRC Questions dated 7-28-16

Jack,
Based upon our conversation on Wednesday 8/3/16, VY agreed to provide a copy of the Part 61 analysis which was used to identify the radionuclide concentrations on the Torus water. Accordingly, please find attached a copy of the Part 61 report from GEL Laboratories, dated April 26, 2016.

In response to the Staffs second question, VY and the NRC discussed the process for sampling of material prior to making radioactive shipments. VY procedure V-EN-RW-102, Shipment of Radioactive Material, requires an isotopic be performed to ensure the material is appropriately classified per 10 CFR 61.55 requirements. The isotopic is performed on a sample of the material (in this case a water sample) prior to completing the shipment manifest. As such, VY is committed to sampling water prior to shipment to satisfy the requirements of 10CFR61.55.

In addition, Vermont Yankee commits to the following: Vermont Yankee will perform a representative sample prior to each shipment of water and will confirm that the radionuclide concentrations result in doses that are equal to or less than, the doses delineated within the Summary of Project Alternative Disposal Dose Results, in our June 28, 2016 letter (BVY 16-021; ADAMS Accession No. ML16182A035).

For example, the above could be satisfied in the following manner: A representative sample is taken prior to a shipment and the radionuclide concentrations are verified to be equal to or less than those concentrations shown on the Data Input Worksheet, of our June 28, 2016 letter. An alternative method to be used, such as when a radionuclide is identified as being slightly above the concentrations (while others may be lower), then sample radionuclide concentrations would be input into the Site Specific Dose Assessment Methodology (SSDA) used in our June 28, 2016 letter and the dose consequences verified to be equal to or less than that delineated within the Summary of Project Alternative Disposal Dose Results.

Please let me know if there are any further questions.
Thank You.
Tom Silko
(802) 451-3166

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

April 26, 2016

Mr. Mark Vandale
Entergy Nuclear Operations, Inc., VY
530 Governor Hunt Road
PO Box 250
Vernon, Vermont 05354

Re: Vermont Yankee Part 61
Work Order: 395827

Dear Mr. Vandale:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 21, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4504.

Sincerely,

Erin B Trent

Erin Trent
Project Manager

Purchase Order: 10287833
Enclosures

Table of Contents

Case Narrative

Case Narrative
for
Vermont Yankee, Entergy Nuclear Operations Inc.
SDG: 395827

April 26, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 21, 2016 for analysis. Chain of Custody form did not contain a relinquished signature. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

Laboratory ID	Client ID
395827001	Torus Water #2

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.

Erin Trent
Project Manager

Chain of Custody

Page: 1 of 1
Project #:
GEL Quote #:
COC Number (1):
PO Number: 10287833

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number: 395827

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: Mark T. Vandale — Phone #: 802-258-5579
Project/Site Name: Entergy Nuclear Vermont Yankee — Fax #: 802-258-5489
Address: 320 Governor Hunt Road, Vernon, VT 05354
Collected by: Chemistry — Send Results John Ewell

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered: Radioactive	Should this sample be considered: TSCA Regulated	Total number of containers	10 CFR Part 61	<-- Preservative Type (6)	Comments
Torus Water #2	4/11/2016	910	G	na	W	Y	na	2	X		Note: extra sample is required for sample specific QC
											2 Gallons

TAT Requested: Normal: ____ **Rush:** XX Specify: ____ (Subject to Surcharge) — Fax Results: Yes / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Two gallons are being shipped. Gamma Spec provided. We need these samples to be counted as close as possible to the environmental levels provided.

Sample Collection Time Zone: Eastern / Central / Mountain / Pacific / Other ____

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1 Mark Vandale	4/20/16	0540	1 mark	4-21-16	910
2			2		
3			3		

Sample Shipping and Delivery Details

GEL PM:
Method of Shipment: FedEx — Date Shipped: 4/20/16
Airbill #: 8094 6816 9664
Airbill #:

1.) Chain of Custody Number = Client Determined

2.) QC Codes: **N** = Normal Sample, **TB** = Trip Blank, **FD** = Field Duplicate, **EB** = Equipment Blank, **MS** = Matrix Spike Sample, **MSD** = Matrix Spike Duplicate Sample, **G** = Grab, **C** = Composite

3.) Field Filtered: For liquid matrices, indicate with a - **Y** - for yes the sample was field filtered or - **N** - for sample was not field filtered.

4.) Matrix Codes: **DW**=Drinking Water, **GW**=Groundwater, **SW**=Surface Water, **WW**=Waste Water, **W**=Water, **ML**=Misc Liquid, **SO**=Soil, **SD**=Sediment, **SL**=Sludge, **SS**=Solid Waste, **O**=Oil, **F**=Filter, **P**=Wipe, **U**=Urine, **F**=Fecal, **N**=Nas

5.) Sample Analysis Requested: Analytical method requested (i.e. **8260B, 6010B/7470A**) and number of containers provided for each (i.e. *8260B* - **3**, *6010B 7470A* - **1**).

6.) Preservative Type: **HA** = Hydrochloric Acid, **NI** = Nitric Acid, **SH** = Sodium Hydroxide, **SA** = Sulfuric Acid, **AA** = Ascorbic Acid, **HX** = Hexane, **ST** = Sodium Thiosulfate, If no preservative is added = leave field blank

For Lab Receiving Use Only
Custody Seal Intact? YES NO
Cooler Temp: C

WHITE = LABORATORY **YELLOW = FILE** **PINK = CLIENT**

	LLD (PCI/L)	(µCi/ml)
^{3}H	2000	2.0E-06
^{54}Mn	15	1.5E-08
^{59}Fe	30	3.0E-08
^{58}Co	15	1.5E-08
^{60}Co	15	1.5E-08
^{65}Zn	30	3.0E-08
^{95}Zr	30	3.0E-08
^{95}Nb	15	1.5E-08
^{134}Cs	15	1.5E-08
^{137}Cs	18	1.8E-08
^{55}Fe	110	1.1E-07
^{63}Ni	530	5.3E-07
^{89}Sr	23	2.3E-08
^{90}Sr	3.5	3.5E-09
Alpha Emitters	15	1.5E-08

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: VERM			**SDG/AR/COC/Work Order:** 395827
Received By: Shanta Mack			**Date Received:** 4-21-16 9:10
Suspected Hazard Information	**Yes**	**No**	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	✓		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 60cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 21C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): ES03295855
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		✓		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?			✓	Sample ID's affected: time on samples is 8:00
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 8094 6816 9664

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EST Date 4/21/16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Laboratory Certifications

List of current GEL Certifications as of 26 April 2016

State	Certification
Alaska	UST−0110
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122016−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−16−11
Utah NELAP	SC000122016−20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
Vermont Yankee, Entergy Nuclear Operations Inc. (NTRG)
SDG #: 395827

Method/Analysis Information

Product:	**Alphaspec Pu242, Liquid**
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number:	1562629

Sample ID	Client ID
395827001	Torus Water #2
1203535939	Method Blank (MB)
1203535941	Laboratory Control Sample (LCS)
1203535940	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Sample 395827001 (Torus Water #2) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec Am241, Cm, Liquid**
Analytical Method:	DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number:	1562630

Sample ID	Client ID
395827001	Torus Water #2
1203535946	Method Blank (MB)
1203535948	Laboratory Control Sample (LCS)
1203535947	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with

GL-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Alphaspec Np, Liquid**
Analytical Method:	ASTM C 1476-00 Modified
Analytical Batch Number:	1562631

Sample ID	Client ID
395827001	Torus Water #2
1203535949	Method Blank (MB)
1203535951	Laboratory Control Sample (LCS)
1203535950	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-032 REV# 20.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Gammaspec, Gamma, Liquid (Standard List)**
Analytical Method:	EPA 901.1
Analytical Batch Number:	1561698

Sample ID	Client ID
395827001	Torus Water #2
1203533384	Method Blank (MB)
1203533386	Laboratory Control Sample (LCS)
1203533385	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 1513408 was generated due to RDL less than MDA. The following RDLs in sample 395827001 were not achieved: Cs-134, Fe-59, Nb-95 and Zr-95. The following RDLs in DUP 1203533385 were not achieved: Cs-134, Fe-59, Nb-95 and Zr-95. Samples did not meet the required detection limit due to high sample activity. Reporting results.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Gamma I129, Liquid**
Analytical Method:	DOE EML HASL-300,I-01 Modified
Analytical Batch Number:	1562602

Sample ID	Client ID
395827001	Torus Water #2
1203535843	Method Blank (MB)
1203535846	Laboratory Control Sample (LCS)
1203535844	395827001(Torus Water #2) Sample Duplicate (DUP)
1203535845	395827001(Torus Water #2) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-006 REV# 21.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Gamma Ni59, Liquid**
Analytical Method:	DOE RESL Ni-1
Analytical Batch Number:	1562693

Sample ID	Client ID
395827001	Torus Water #2
1203536149	Method Blank (MB)
1203536151	Laboratory Control Sample (LCS)
1203536150	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries
All chemical recoveries meet the required acceptance limits for this sample set.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**GFPC, Sr89&Sr90, Liquid**
Analytical Method:	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
Analytical Batch Number:	1562716

Sample ID	Client ID

395827001	Torus Water #2
1203536197	Method Blank (MB)
1203536199	Laboratory Control Sample (LCS)
1203536198	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries
All chemical recoveries meet the required acceptance limits for this sample set.

Recounts
Sample 1203536198 (Torus Water #2DUP) was recounted due to a suspected total strontium false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Pu241, Liquid**
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number:	1562632

Sample ID	Client ID
395827001	Torus Water #2
1203535952	Method Blank (MB)
1203535954	Laboratory Control Sample (LCS)
1203535953	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-035 REV# 16.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Samples 1203535952 (MB), 1203535953 (Torus Water #2DUP) and 395827001 (Torus Water #2) were recounted due to high MDCs. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Fe55, Liquid**
Analytical Method:	DOE RESL Fe-1, Modified
Analytical Batch Number:	1562672

Sample ID	Client ID
395827001	Torus Water #2
1203536076	Method Blank (MB)
1203536078	Laboratory Control Sample (LCS)
1203536077	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-040 REV# 12.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Ni63, Liquid**
Analytical Method:	DOE RESL Ni-1, Modified
Analytical Batch Number:	1562678

Sample ID	Client ID
395827001	Torus Water #2
1203536092	Method Blank (MB)
1203536094	Laboratory Control Sample (LCS)
1203536093	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-022 REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Tc99, Liquid**
Analytical Method:	DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number:	1562683

Sample ID	Client ID
395827001	Torus Water #2
1203536111	Method Blank (MB)
1203536113	Laboratory Control Sample (LCS)
1203536112	395827001(Torus Water #2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-059 REV# 4.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Samples were recounted due to high relative percent difference/relative error ratio. The recount results are similar to the original results. Original results are reported.

Miscellaneous Information:

Data Exception (DER) Documentation
A data exception report (DER) 1517546 was generated for samples in this SDG/batch. DER 1517546 was generated due to Failed RPD for DUP. 1. Sample 395827001 and duplicate 1203536112 do not meet the relative percent difference requirement or the relative error ratio requirement due to the matrix of the sample. 1. Reporting results.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**LSC, Tritium Dist, Liquid**
Analytical Method:	EPA 906.0 Modified
Analytical Batch Number:	1562687

Sample ID	Client ID
395827001	Torus Water #2
1203536126	Method Blank (MB)
1203536129	Laboratory Control Sample (LCS)
1203536127	395827001(Torus Water #2) Sample Duplicate (DUP)
1203536128	395827001(Torus Water #2) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The Matrix Spike 1203536128 (Torus Water #2MS) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
Sample 1203536129 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
The matrix spike, 1203536128 (Torus Water #2MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint C14, Liquid**
Analytical Method:	EPA EERF C-01 Modified
Analytical Batch Number:	1562691

Sample ID	Client ID
395827001	Torus Water #2
1203536141	Method Blank (MB)
1203536144	Laboratory Control Sample (LCS)
1203536142	395827001(Torus Water #2) Sample Duplicate (DUP)
1203536143	395827001(Torus Water #2) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-003 REV# 15.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry
All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information
The blank volume is representative of the sample volume in this batch.

QC Information
All of the QC samples met the required acceptance limits.

Designated QC
The following sample was used for QC: 395827001 (Torus Water #2).

Technical Information:

Holding Time
All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis
None of the samples in this sample set required reprep or reanalysis.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration
No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC
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VERM001 Vermont Yankee, Entergy Nuclear Operations Inc.
Client SDG: 395827 GEL Work Order: 395827

Sample(s) Contained within this report:

Lab Sample ID	Client Sample ID	Sample Description	Collected
395827001	Torus Water #2	N/A	04/11/2016 09:10

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Erin Trent.

Reviewed by

Signature:  **Name: Theresa Austin**

Date: 05 MAY 2016 **Title: Group Leader**

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
22-APR-16	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GAMMA SPECTROMETER	EPA 901.1	Liquid	VERM
Batch ID:	**Sample Numbers:**		
1561698	See Below		

Potentially affected work order(s)(SDG): 395827

Application Issues:

RDL less than MDA

Specification and Requirements Exception Description:	**DER Disposition:**
The following RDLs in sample 395827001 were not achieved: Cs-134, Fe-59, Nb-95 and Zr-95. The following RDLs in DUP 1203533385 were not achieved: Cs-134, Fe-59, Nb-95 and Zr-95.	Samples did not meet the required detection limit due to high sample activity. Reporting results.

Originator's Name:

Spencer Collins 22-APR-16

Data Validator/Group Leader:

Shenise Gerideau 22-APR-16

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
05-MAY-16	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
LSC	DOE EML HASL-300, Tc-02-RC Modified	Liquid	VERM
Batch ID:	**Sample Numbers:**		
1562683	See Below		

Potentially affected work order(s)(SDG): 395827

Application Issues:

Failed RPD for DUP

Specification and Requirements Exception Description:	**DER Disposition:**
1. Sample 395827001 and duplicate 1203536112 do not meet the relative percent difference requirement or the relative error ratio requirement due to the matrix of the sample.	1. Reporting results.

Originator's Name:

Elizabeth Krouse 05-MAY-16

Data Validator/Group Leader:

Lyndsey Pace 05-MAY-16

Sample Data Summary

GEL LABORATORIES LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID: 395827001
Client Sample ID: Torus Water #2
Matrix: Water
Geometry Received:

Client: Vermont Yankee, Entergy Nuclear Operati
Collect Date: April 11, 2016
Receive Date: April 21, 2016
Report Date: May 05, 2016

Analyte	Run Date	Qualifier	Activity[2]	2 Sigma Uncertainty	MDA[1]	RL	Units
H-3	04/29/16	3	1.70E+06	3.33E+04	1.75E+03	2.00E+03	pCi/L
C-14	05/03/16	U	1.49E+01	2.41E+01	4.08E+01	5.00E+01	pCi/L
Fe-55	04/28/16	3	9.53E+01	6.05E+01	8.07E+01	1.10E+02	pCi/L
Ni-63	04/29/16	3	7.94E+02	7.12E+01	7.04E+01	5.30E+02	pCi/L
Sr-89	05/02/16	U	1.08E+00	1.29E+00	2.18E+00	2.30E+01	pCi/L
Sr-90	05/02/16	U	3.31E-01	9.80E-01	2.66E+00	3.50E+00	pCi/L
Tc-99	05/03/16	3	3.89E+03	9.37E+01	4.26E+01	5.00E+01	pCi/L
Pu-241	05/04/16	U	7.38E+00	1.13E+01	1.91E+01	2.50E+01	pCi/L
Alpha Spec							
Np-237	04/30/16	U	-1.66E-01	3.14E-01	9.68E-01	1.50E+01	pCi/L
Pu-238	05/02/16	U	1.96E-02	2.14E-01	4.50E-01	1.50E+01	pCi/L
Pu-239/240	05/02/16	U	4.85E-02	2.13E-01	3.86E-01	1.50E+01	pCi/L
Pu-242	05/02/16	U	1.91E-01	2.99E-01	4.10E-01	1.50E+01	pCi/L
Am-241	04/30/16	U	4.31E-02	7.39E-02	6.47E-02	1.50E+01	pCi/L
Cm-242	04/30/16	U	0.00E+00	4.66E-02	6.93E-02	1.50E+01	pCi/L
Cm-243/244	04/30/16	U	-5.11E-03	4.41E-02	1.02E-01	1.50E+01	pCi/L
Gamma Spec							
Be-7	04/21/16	U	3.92E+01	9.40E+01	1.59E+02		pCi/L
Na-22	04/21/16	U	6.07E+00	7.93E+00	1.35E+01		pCi/L
K-40	04/21/16	U	1.14E+01	5.16E+01	8.56E+01		pCi/L
Cr-51	04/21/16	U	3.07E+01	9.82E+01	1.69E+02		pCi/L
Mn-54	04/21/16	3	4.71E+02	2.43E+01	2.38E+01	1.50E+01	pCi/L
Fe-59	04/21/16	U	2.87E+01	3.55E+01	6.01E+01	3.00E+01	pCi/L
Co-56	04/21/16	U	7.28E+00	1.52E+01	2.61E+01		pCi/L
Co-57	04/21/16	U	3.24E+00	7.66E+00	1.28E+01		pCi/L
Co-58	04/21/16	3	9.00E+01	2.06E+01	2.46E+01	1.50E+01	pCi/L
Co-60	04/21/16	3	2.07E+04	7.10E+01	1.26E+01	1.50E+01	pCi/L
Ni-59	04/28/16	U	5.85E+00	6.40E+00	1.01E+01	2.00E+01	pCi/L
Zn-65	04/21/16	3	1.95E+03	6.85E+01	5.59E+01	3.00E+01	pCi/L
Y-88	04/21/16	U	-1.32E+00	5.08E+00	8.67E+00		pCi/L
Zr-95	04/21/16	U	2.37E+01	2.40E+01	4.17E+01	3.00E+01	pCi/L
Nb-94	04/21/16	U	-7.62E+00	1.13E+01	1.84E+01		pCi/L
Nb-95	04/21/16	U	6.97E+00	1.34E+01	2.31E+01	1.50E+01	pCi/L
Ru-106	04/21/16	U	3.19E+01	1.04E+02	1.72E+02		pCi/L
Ag-110m	04/21/16	U	-4.46E+00	2.14E+01	3.65E+01		pCi/L
Sn-113	04/21/16	U	9.02E+00	1.28E+01	2.19E+01		pCi/L

Note(s):
1. Calculated MDAs are a-posteriori values at the 95% confidence level.
2. Activity is reported on a dry weight basis unless otherwise indicated in the case narrativeand is decay corrected to the sample collect date.
3. Results are statistically positive at the 95% confidence level. (activity is greater than or equal to the two sigma uncertainty)

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

GEL LABORATORIES LLC

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10 CFR Part 50/61 Certificate of Analysis

GEL Sample ID: 395827001
Client Sample ID: Torus Water #2
Matrix: Water
Geometry Received:

Client: Vermont Yankee, Entergy Nuclear Operati
Collect Date: April 11, 2016
Receive Date: April 21, 2016
Report Date: May 05, 2016

Analyte	Run Date	Qualifier	Activity[2]	2 Sigma Uncertainty	MDA[1]	RL	Units
Sb-124	04/21/16	U	-3.65E+00	1.09E+01	1.88E+01		pCi/L
Sb-125	04/21/16	U	8.30E+00	2.74E+01	4.64E+01		pCi/L
I-129	04/27/16	U	-3.73E-02	8.59E-01	1.51E+00	2.00E+00	pCi/L
Cs-134	04/21/16	U	-1.30E+01	1.47E+01	2.52E+01	1.50E+01	pCi/L
Cs-136	04/21/16	U	5.93E+00	3.45E+01	5.84E+01		pCi/L
Cs-137	04/21/16	3	1.13E+03	2.43E+01	2.06E+01	1.80E+01	pCi/L
Ba-133	04/21/16	U	-7.26E+00	1.32E+01	2.09E+01		pCi/L
Ba-140	04/21/16	U	-1.12E+01	6.57E+01	1.10E+02		pCi/L
Ce-139	04/21/16	U	-8.99E+00	8.66E+00	1.42E+01		pCi/L
Ce-141	04/21/16	U	-9.12E+00	1.67E+01	2.77E+01		pCi/L
Ce-144	04/21/16	U	3.42E+01	5.98E+01	9.96E+01		pCi/L
Nd-147	04/21/16	U	-8.63E+01	1.33E+02	2.22E+02		pCi/L
Pm-144	04/21/16	U	1.21E+00	1.14E+01	1.88E+01		pCi/L
Pm-146	04/21/16	U	4.46E+00	1.29E+01	2.19E+01		pCi/L
Eu-152	04/21/16	U	1.35E+01	2.86E+01	4.91E+01		pCi/L
Eu-154	04/21/16	U	1.78E+01	2.25E+01	3.83E+01		pCi/L
Eu-155	04/21/16	U	1.43E+01	3.04E+01	5.10E+01		pCi/L
Ir-192	04/21/16	U	-2.79E+00	9.96E+00	1.71E+01		pCi/L
Hg-203	04/21/16	U	8.62E+00	1.07E+01	1.86E+01		pCi/L
Tl-208	04/21/16	U	8.75E+00	1.20E+01	1.91E+01		pCi/L
Pb-210	04/21/16	U	9.04E+02	1.07E+03	1.84E+03		pCi/L
Pb-212	04/21/16	U	-1.47E+00	1.92E+01	3.09E+01		pCi/L
Pb-214	04/21/16	U	-6.77E+00	2.15E+01	3.65E+01		pCi/L
Bi-212	04/21/16	U	-6.90E+01	1.77E+02	2.89E+02		pCi/L
Bi-214	04/21/16	U	-1.64E+00	2.21E+01	3.64E+01		pCi/L
Ra-228	04/21/16	U	4.22E+01	6.30E+01	1.08E+02		pCi/L
Ac-228	04/21/16	U	4.22E+01	6.30E+01	1.08E+02		pCi/L
Th-234	04/21/16	3,U	3.77E+02	3.56E+02	5.78E+02		pCi/L
U-235	04/21/16	U	-3.80E+01	5.95E+01	9.77E+01		pCi/L
U-238	04/21/16	3,U	3.77E+02	3.56E+02	5.78E+02		pCi/L
Np-239	04/21/16	U	7.01E+01	7.43E+01	1.32E+02		pCi/L
Am-241	04/21/16	U	-2.43E+01	4.16E+01	7.09E+01		pCi/L

Note(s):
1. Calculated MDAs are a-posteriori values at the 95% confidence level.
2. Activity is reported on a dry weight basis unless otherwise indicated in the case narrativeand is decay corrected to the sample collect date.
3. Results are statistically positive at the 95% confidence level. (activity is greater than or equal to the two sigma uncertainty)

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

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10 CFR Part 50/61 Isotope Abundance Report

GEL Sample ID: 395827001 **Client:** Vermont Yankee, Entergy Nuclear Operations Inc.

Client Sample ID: Torus Water #2 **Collect Date:** April 11, 2016

Matrix: Water **Receive Date:** April 21, 2016

Analyte	Activity	Units	% Abundance
Ni-63	7.94E+02	pCi/L	000.05
Tc-99	3.89E+03	pCi/L	000.22
H-3	1.70E+06	pCi/L	098.31
Alpha Spec			
Gamma Spec			
Cs-137	1.13E+03	pCi/L	000.07
Co-60	2.07E+04	pCi/L	001.20
Mn-54	4.71E+02	pCi/L	000.03
Zn-65	1.95E+03	pCi/L	000.11

Total Activity: 1.73E+06 **Total % Abundance:** 100.00

Quality Control Summary

QC Summary

Report Date: May 5, 2016

Entergy Nuclear Operations, Inc., VY
530 Governor Hunt Road
PO Box 250
Vernon, Vermont

Contact: **Mr. Mark Vandale**

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch 1562629											
QC1203535940 395827001 DUP											
Plutonium-238	U	0.0196	U	0.132	pCi/L	N/A			N/A MXS2	04/30/16	11:03
	Uncertainty	+/-0.214		+/-0.142							
Plutonium-239/240	U	0.0485	U	0.0824	pCi/L	N/A			N/A		
	Uncertainty	+/-0.213		+/-0.113							
Plutonium-242	U	0.191	U	0.0763	pCi/L	N/A			N/A		
	Uncertainty	+/-0.299		+/-0.113							
QC1203535941 LCS											
Plutonium-238			U	0.0475	pCi/L					04/30/16	11:03
	Uncertainty			+/-0.107							
Plutonium-239/240	4.94			5.71	pCi/L		116	(75%-125%)			
	Uncertainty			+/-0.770							
Plutonium-242			U	0.0545	pCi/L						
	Uncertainty			+/-0.108							
QC1203535939 MB											
Plutonium-238			U	0.0605	pCi/L					04/30/16	11:05
	Uncertainty			+/-0.0977							
Plutonium-239/240			U	-0.0135	pCi/L						
	Uncertainty			+/-0.0611							
Plutonium-242			U	0.0215	pCi/L						
	Uncertainty			+/-0.0828							
Batch 1562630											
QC1203535947 395827001 DUP											
Americium-241	U	0.0431		0.0765	pCi/L	16.6			N/A MXS2	04/30/16	11:05
	Uncertainty	+/-0.0739		+/-0.101							
Curium-242	U	0.00	U	0.00	pCi/L	N/A			N/A		
	Uncertainty	+/-0.0466		+/-0.055							
Curium-243/244	U	-0.00511	U	0.0252	pCi/L	N/A			N/A		
	Uncertainty	+/-0.0441		+/-0.0707							
QC1203535948 LCS											
Americium-241	4.93			5.27	pCi/L		107	(75%-125%)		04/30/16	11:08
	Uncertainty			+/-0.623							
Curium-242			U	0.0144	pCi/L						
	Uncertainty			+/-0.0539							
Curium-243/244	6.61			6.22	pCi/L		94.1	(75%-125%)			
	Uncertainty			+/-0.671							
QC1203535946 MB											
Americium-241			U	0.0246	pCi/L					04/30/16	11:05
	Uncertainty			+/-0.0949							
Curium-242			U	-0.00542	pCi/L						
	Uncertainty			+/-0.0468							

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch 1562630											
Curium-243/244			U	0.00629	pCi/L						
	Uncertainty			+/-0.0657							
Batch 1562631											
QC1203535950 395827001 DUP											
Neptunium-237	U	-0.166	U	0.225	pCi/L	N/A			N/A MXS2	04/30/16	10:57
	Uncertainty	+/-0.314		+/-0.654							
QC1203535951 LCS											
Neptunium-237	89.3			91.8	pCi/L		103	(75%-125%)		04/30/16	10:59
	Uncertainty			+/-6.94							
QC1203535949 MB											
Neptunium-237			U	0.0941	pCi/L					04/30/16	10:57
	Uncertainty			+/-0.422							
Batch 1562632											
QC1203535953 395827001 DUP											
Plutonium-241	U	7.38	U	-1.65	pCi/L	N/A			N/A MXS2	05/04/16	15:25
	Uncertainty	+/-11.3		+/-7.13							
QC1203535954 LCS											
Plutonium-241	194			216	pCi/L		111	(75%-125%)		05/03/16	14:19
	Uncertainty			+/-27.4							
QC1203535952 MB											
Plutonium-241			U	-1.4	pCi/L					05/04/16	13:54
	Uncertainty			+/-7.62							
Rad Gamma Spec											
Batch 1561698											
QC1203533385 395827001 DUP											
Actinium-228	U	42.2	U	-83.9	pCi/L	N/A			N/A MJH1	04/22/16	06:34
	Uncertainty	+/-63.0		+/-95.8							
Americium-241	U	-24.3	U	-30.2	pCi/L	N/A			N/A		
	Uncertainty	+/-41.6		+/-50.5							
Antimony-124	U	-3.65	U	1.84	pCi/L	N/A			N/A		
	Uncertainty	+/-10.9		+/-15.8							
Antimony-125	U	8.30	U	-5.76	pCi/L	N/A			N/A		
	Uncertainty	+/-27.4		+/-41.9							
Barium-133	U	-7.26	U	-11.2	pCi/L	N/A			N/A		
	Uncertainty	+/-13.2		+/-20.8							
Barium-140	U	-11.2	U	55.0	pCi/L	N/A			N/A		
	Uncertainty	+/-65.7		+/-103							
Beryllium-7	U	39.2	U	51.4	pCi/L	N/A			N/A		
	Uncertainty	+/-94.0		+/-144							
Bismuth-212	U	-69	U	27.2	pCi/L	N/A			N/A		
	Uncertainty	+/-177		+/-257							
Bismuth-214	U	-1.64	U	1.58	pCi/L	N/A			N/A		
	Uncertainty	+/-22.1		+/-34.0							
Cerium-139	U	-8.99	U	1.86	pCi/L	N/A			N/A		
	Uncertainty	+/-8.66		+/-12.7							

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 1561698											
Cerium-141	U	-9.12	U	-12	pCi/L	N/A		N/A			
	Uncertainty	+/-16.7		+/-24.6							
Cerium-144	U	34.2	U	16.8	pCi/L	N/A		N/A	MJH1	04/22/16	06:34
	Uncertainty	+/-59.8		+/-87.5							
Cesium-134	U	-13	U	-8.32	pCi/L	N/A		N/A			
	Uncertainty	+/-14.7		+/-22.6							
Cesium-136	U	5.93	U	-39.4	pCi/L	N/A		N/A			
	Uncertainty	+/-34.5		+/-53.9							
Cesium-137		1130		1150	pCi/L	2.28		(0%-20%)			
	Uncertainty	+/-24.3		+/-36.7							
Chromium-51	U	30.7	U	3.78	pCi/L	N/A		N/A			
	Uncertainty	+/-98.2		+/-147							
Cobalt-56	U	7.28	U	5.84	pCi/L	N/A		N/A			
	Uncertainty	+/-15.2		+/-23.3							
Cobalt-57	U	3.24	U	6.90	pCi/L	N/A		N/A			
	Uncertainty	+/-7.66		+/-12.0							
Cobalt-58		90.0		89.1	pCi/L	0.982		(0% - 100%)			
	Uncertainty	+/-20.6		+/-28.7							
Cobalt-60		20700		20400	pCi/L	1.55		(0%-20%)			
	Uncertainty	+/-71.0		+/-103							
Europium-152	U	13.5	U	-7.81	pCi/L	N/A		N/A			
	Uncertainty	+/-28.6		+/-42.7							
Europium-154	U	17.8	U	17.7	pCi/L	N/A		N/A			
	Uncertainty	+/-22.5		+/-31.6							
Europium-155	U	14.3	U	20.9	pCi/L	N/A		N/A			
	Uncertainty	+/-30.4		+/-44.2							
Iridium-192	U	-2.79	U	-2.06	pCi/L	N/A		N/A			
	Uncertainty	+/-9.96		+/-15.4							
Iron-59	U	28.7	U	-55.9	pCi/L	N/A		N/A			
	Uncertainty	+/-35.5		+/-53.1							
Lead-210	U	904	U	-414	pCi/L	N/A		N/A			
	Uncertainty	+/-1070		+/-1020							
Lead-212	U	-1.47	U	0.365	pCi/L	N/A		N/A			
	Uncertainty	+/-19.2		+/-26.2							
Lead-214	U	-6.77	U	7.39	pCi/L	N/A		N/A			
	Uncertainty	+/-21.5		+/-32.0							
Manganese-54		471		481	pCi/L	1.95		(0%-20%)			
	Uncertainty	+/-24.3		+/-36.4							
Mercury-203	U	8.62	U	0.957	pCi/L	N/A		N/A			
	Uncertainty	+/-10.7		+/-15.9							
Neodymium-147	U	-86.3	U	-52.1	pCi/L	N/A		N/A			
	Uncertainty	+/-133		+/-208							
Neptunium-239	U	70.1	U	-65.9	pCi/L	N/A		N/A			
	Uncertainty	+/-74.3		+/-115							

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 1561698											
Niobium-94	U	-7.62	U	14.9	pCi/L	N/A		N/A			
	Uncertainty	+/-11.3		+/-16.4							
Niobium-95	U	6.97	U	22.9	pCi/L	N/A		N/A	MJH1	04/22/16	06:34
	Uncertainty	+/-13.4		+/-23.5							
Potassium-40	U	11.4	U	16.1	pCi/L	N/A		N/A			
	Uncertainty	+/-51.6		+/-69.1							
Promethium-144	U	1.21	U	1.11	pCi/L	N/A		N/A			
	Uncertainty	+/-11.4		+/-16.5							
Promethium-146	U	4.46	U	-18.9	pCi/L	N/A		N/A			
	Uncertainty	+/-12.9		+/-19.7							
Radium-228	U	42.2	U	-83.9	pCi/L	N/A		N/A			
	Uncertainty	+/-63.0		+/-95.8							
Ruthenium-106	U	31.9	U	136	pCi/L	N/A		N/A			
	Uncertainty	+/-104		+/-159							
Silver-110m	U	-4.46	U	40.9	pCi/L	N/A		N/A			
	Uncertainty	+/-21.4		+/-33.1							
Sodium-22	U	6.07	U	6.22	pCi/L	N/A		N/A			
	Uncertainty	+/-7.93		+/-11.1							
Thallium-208	U	8.75	U	-15.1	pCi/L	N/A		N/A			
	Uncertainty	+/-12.0		+/-19.0							
Thorium-234	U	377	U	155	pCi/L	N/A		N/A			
	Uncertainty	+/-356		+/-425							
Tin-113	U	9.02	U	0.622	pCi/L	N/A		N/A			
	Uncertainty	+/-12.8		+/-19.4							
Uranium-235	U	-38	U	16.4	pCi/L	N/A		N/A			
	Uncertainty	+/-59.5		+/-85.7							
Uranium-238	U	377	U	155	pCi/L	N/A		N/A			
	Uncertainty	+/-356		+/-425							
Yttrium-88	U	-1.32	U	-5.55	pCi/L	N/A		N/A			
	Uncertainty	+/-5.08		+/-7.20							
Zinc-65		1950		1870	pCi/L	3.98		(0%-20%)			
	Uncertainty	+/-68.5		+/-96.7							
Zirconium-95	U	23.7	U	-5.38	pCi/L	N/A		N/A			
	Uncertainty	+/-24.0		+/-36.8							
QC1203533386 LCS											
Actinium-228			U	122	pCi/L					04/22/16	06:39
	Uncertainty			+/-399							
Americium-241	34400			39700	pCi/L		115	(75%-125%)			
	Uncertainty			+/-1740							
Antimony-124			U	15.9	pCi/L						
	Uncertainty			+/-46.1							
Antimony-125			U	-157	pCi/L						
	Uncertainty			+/-241							
Barium-133			U	27.6	pCi/L						
	Uncertainty										

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1561698										
				+/-103						
Barium-140			U	153	pCi/L				MJH1	04/22/16 06:39
	Uncertainty			+/-282						
Beryllium-7			U	-119	pCi/L					
	Uncertainty			+/-768						
Bismuth-212			U	540	pCi/L					
	Uncertainty			+/-1080						
Bismuth-214			U	-68.5	pCi/L					
	Uncertainty			+/-142						
Cerium-139			U	43.7	pCi/L					
	Uncertainty			+/-66.4						
Cerium-141			U	-75.7	pCi/L					
	Uncertainty			+/-112						
Cerium-144			U	-268	pCi/L					
	Uncertainty			+/-478						
Cesium-134			U	23.7	pCi/L					
	Uncertainty			+/-94.4						
Cesium-136			U	-66.4	pCi/L					
	Uncertainty			+/-158						
Cesium-137	13500			13700	pCi/L		102	(75%-125%)		
	Uncertainty			+/-354						
Chromium-51			U	-199	pCi/L					
	Uncertainty			+/-630						
Cobalt-56			U	81.9	pCi/L					
	Uncertainty			+/-88.7						
Cobalt-57				267	pCi/L					
	Uncertainty			+/-108						
Cobalt-58			U	-46.9	pCi/L					
	Uncertainty			+/-87.5						
Cobalt-60	13800			14200	pCi/L		103	(75%-125%)		
	Uncertainty			+/-408						
Europium-152			U	-101	pCi/L					
	Uncertainty			+/-237						
Europium-154			U	43.3	pCi/L					
	Uncertainty			+/-136						
Europium-155			U	146	pCi/L					
	Uncertainty			+/-300						
Iridium-192			U	57.9	pCi/L					
	Uncertainty			+/-74.3						
Iron-59			U	45.3	pCi/L					
	Uncertainty			+/-199						
Lead-210				4.51E+05	pCi/L					
	Uncertainty			+/-50700						

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 1561698											
Lead-212			U	-41.7	pCi/L						
	Uncertainty			+/-143							
Lead-214			U	-66.5	pCi/L				MJH1	04/22/16	06:39
	Uncertainty			+/-183							
Manganese-54			U	22.0	pCi/L						
	Uncertainty			+/-87.1							
Mercury-203			U	-25.5	pCi/L						
	Uncertainty			+/-77.1							
Neodymium-147			U	-259	pCi/L						
	Uncertainty			+/-538							
Neptunium-239			U	356	pCi/L						
	Uncertainty			+/-781							
Niobium-94			U	9.74	pCi/L						
	Uncertainty			+/-68.8							
Niobium-95			U	28.1	pCi/L						
	Uncertainty			+/-77.3							
Potassium-40			U	-26.7	pCi/L						
	Uncertainty			+/-253							
Promethium-144			U	6.91	pCi/L						
	Uncertainty			+/-68.5							
Promethium-146			U	-31.7	pCi/L						
	Uncertainty			+/-124							
Radium-228			U	122	pCi/L						
	Uncertainty			+/-399							
Ruthenium-106			U	166	pCi/L						
	Uncertainty			+/-727							
Silver-110m			U	78.2	pCi/L						
	Uncertainty			+/-140							
Sodium-22			U	14.5	pCi/L						
	Uncertainty			+/-47.5							
Thallium-208			U	-13.8	pCi/L						
	Uncertainty			+/-73.8							
Thorium-234			U	-1950	pCi/L						
	Uncertainty			+/-5510							
Tin-113			U	-66.5	pCi/L						
	Uncertainty			+/-108							
Uranium-235			U	147	pCi/L						
	Uncertainty			+/-479							
Uranium-238			U	-1950	pCi/L						
	Uncertainty			+/-5510							
Yttrium-88			U	-3.09	pCi/L						
	Uncertainty			+/-28.7							
Zinc-65				1030	pCi/L						
	Uncertainty			+/-363							

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 1561698											
Zirconium-95			U	31.9	pCi/L						
	Uncertainty			+/-141							
QC1203533384 MB											
Actinium-228			U	-7.16	pCi/L				MJH1	04/22/16	06:34
	Uncertainty			+/-8.38							
Americium-241			U	-1.73	pCi/L						
	Uncertainty			+/-9.55							
Antimony-124			U	-0.0387	pCi/L						
	Uncertainty			+/-2.87							
Antimony-125			U	0.960	pCi/L						
	Uncertainty			+/-4.35							
Barium-133			U	0.347	pCi/L						
	Uncertainty			+/-2.37							
Barium-140			U	-0.895	pCi/L						
	Uncertainty			+/-6.51							
Beryllium-7			U	-8.86	pCi/L						
	Uncertainty			+/-12.3							
Bismuth-212			U	14.2	pCi/L						
	Uncertainty			+/-25.1							
Bismuth-214			U	1.92	pCi/L						
	Uncertainty			+/-4.84							
Cerium-139			U	-0.533	pCi/L						
	Uncertainty			+/-1.59							
Cerium-141			U	2.38	pCi/L						
	Uncertainty			+/-2.53							
Cerium-144			U	5.24	pCi/L						
	Uncertainty			+/-10.6							
Cesium-134			U	0.137	pCi/L						
	Uncertainty			+/-1.84							
Cesium-136			U	-1.24	pCi/L						
	Uncertainty			+/-2.06							
Cesium-137			U	0.134	pCi/L						
	Uncertainty			+/-1.80							
Chromium-51			U	1.84	pCi/L						
	Uncertainty			+/-13.4							
Cobalt-56			U	0.706	pCi/L						
	Uncertainty			+/-1.49							
Cobalt-57			U	-0.172	pCi/L						
	Uncertainty			+/-1.53							
Cobalt-58			U	0.680	pCi/L						
	Uncertainty			+/-1.64							
Cobalt-60			U	1.03	pCi/L						
	Uncertainty			+/-1.93							
Europium-152			U	1.98	pCi/L						
	Uncertainty										

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch 1561698											
				+/-4.87							
Europium-154			U	-0.771	pCi/L				MJH1	04/22/16	06:34
	Uncertainty			+/-4.66							
Europium-155			U	-2.76	pCi/L						
	Uncertainty			+/-6.43							
Iridium-192			U	-0.317	pCi/L						
	Uncertainty			+/-1.62							
Iron-59			U	2.12	pCi/L						
	Uncertainty			+/-2.97							
Lead-210			U	-132	pCi/L						
	Uncertainty			+/-275							
Lead-212			U	1.26	pCi/L						
	Uncertainty			+/-4.97							
Lead-214			U	1.93	pCi/L						
	Uncertainty			+/-5.83							
Manganese-54			U	-0.12	pCi/L						
	Uncertainty			+/-1.62							
Mercury-203			U	1.53	pCi/L						
	Uncertainty			+/-1.59							
Neodymium-147			U	-3.95	pCi/L						
	Uncertainty			+/-11.0							
Neptunium-239			U	-0.573	pCi/L						
	Uncertainty			+/-14.9							
Niobium-94			U	-0.765	pCi/L						
	Uncertainty			+/-1.67							
Niobium-95			U	-0.0743	pCi/L						
	Uncertainty			+/-1.40							
Potassium-40			U	14.3	pCi/L						
	Uncertainty			+/-24.8							
Promethium-144			U	0.643	pCi/L						
	Uncertainty			+/-1.79							
Promethium-146			U	0.158	pCi/L						
	Uncertainty			+/-2.18							
Radium-228			U	-7.16	pCi/L						
	Uncertainty			+/-8.38							
Ruthenium-106			U	-15.7	pCi/L						
	Uncertainty			+/-18.9							
Silver-110m			U	-0.238	pCi/L						
	Uncertainty			+/-1.98							
Sodium-22			U	-0.342	pCi/L						
	Uncertainty			+/-1.62							
Thallium-208			U	-2.26	pCi/L						
	Uncertainty			+/-2.16							

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1561698										
Thorium-234			U	60.3	pCi/L					
	Uncertainty			+/-140						
Tin-113			U	0.153	pCi/L				MJH1	04/22/16 06:34
	Uncertainty			+/-2.10						
Uranium-235			U	-0.388	pCi/L					
	Uncertainty			+/-13.5						
Uranium-238			U	60.3	pCi/L					
	Uncertainty			+/-140						
Yttrium-88			U	-0.798	pCi/L					
	Uncertainty			+/-1.85						
Zinc-65			U	0.806	pCi/L					
	Uncertainty			+/-3.61						
Zirconium-95			U	-1.7	pCi/L					
	Uncertainty			+/-2.56						
Batch 1562602										
QC1203535844 395827001 DUP										
Iodine-129	U	-0.0373	U	0.388	pCi/L	N/A		N/A	MJH1	04/27/16 09:20
	Uncertainty	+/-0.859		+/-1.13						
QC1203535846 LCS										
Iodine-129	52.0			50.2	pCi/L		96.4	(75%-125%)		04/27/16 11:04
	Uncertainty			+/-6.44						
QC1203535843 MB										
Iodine-129			U	-0.17	pCi/L					04/27/16 09:19
	Uncertainty			+/-0.835						
QC1203535845 395827001 MS										
Iodine-129	52.0 U	-0.0373		57.5	pCi/L		111	(75%-125%)		04/27/16 09:20
	Uncertainty	+/-0.859		+/-6.83						
Batch 1562693										
QC1203536150 395827001 DUP										
Nickel-59	U	5.85	U	3.14	pCi/L	N/A		N/A	CXS7	04/28/16 15:36
	Uncertainty	+/-6.40		+/-2.49						
QC1203536151 LCS										
Nickel-59	419			372	pCi/L		88.8	(75%-125%)		04/29/16 06:45
	Uncertainty			+/-26.7						
QC1203536149 MB										
Nickel-59			U	2.87	pCi/L					04/28/16 15:36
	Uncertainty			+/-5.02						
Rad Gas Flow										
Batch 1562716										
QC1203536198 395827001 DUP										
Strontium-89	U	1.08	U	-1.39	pCi/L	N/A		N/A	KSD1	05/02/16 16:24
	Uncertainty	+/-1.29		+/-1.93						
Strontium-90	U	0.331	U	-0.222	pCi/L	N/A		N/A		
	Uncertainty	+/-0.980		+/-1.22						
QC1203536199 LCS										
Strontium-89	522			550	pCi/L		105	(75%-125%)		05/02/16 16:24

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 1562716										
	Uncertainty			+/-13.0						
Strontium-90	536			445	pCi/L		83	(75%-125%)	KSD1	05/02/16 16:24
	Uncertainty			+/-10.4						
QC1203536197 MB										
Strontium-89			U	-1.5	pCi/L					05/02/16 16:27
	Uncertainty			+/-1.18						
Strontium-90			U	0.116	pCi/L					
	Uncertainty			+/-1.00						
Rad Liquid Scintillation										
Batch 1562672										
QC1203536077 395827001 DUP										
Iron-55		95.3		91.2	pCi/L	4.42		(0% - 100%)	CXS7	04/28/16 23:26
	Uncertainty	+/-60.5		+/-58.8						
QC1203536078 LCS										
Iron-55	1660			1440	pCi/L		86.8	(75%-125%)		04/29/16 00:13
	Uncertainty			+/-86.2						
QC1203536076 MB										
Iron-55			U	-42.5	pCi/L					04/28/16 22:39
	Uncertainty			+/-58.1						
Batch 1562678										
QC1203536093 395827001 DUP										
Nickel-63		794		840	pCi/L	5.65		(0%-20%)	CXS7	04/29/16 14:53
	Uncertainty	+/-71.2		+/-71.1						
QC1203536094 LCS										
Nickel-63	1690			2090	pCi/L		124	(75%-125%)		04/29/16 15:09
	Uncertainty			+/-101						
QC1203536092 MB										
Nickel-63			U	-6.46	pCi/L					04/29/16 14:37
	Uncertainty			+/-37.6						
Batch 1562683										
QC1203536112 395827001 DUP										
Technetium-99		3890		254	pCi/L	175*		(0%-20%)	MYM1	05/03/16 15:12
	Uncertainty	+/-93.7		+/-33.3						
QC1203536113 LCS										
Technetium-99	861			841	pCi/L		97.7	(75%-125%)		05/03/16 15:28
	Uncertainty			+/-48.9						
QC1203536111 MB										
Technetium-99			U	-11.4	pCi/L					05/03/16 14:55
	Uncertainty			+/-24.1						
Batch 1562687										
QC1203536127 395827001 DUP										
Tritium		1.70E+06		1.72E+06	pCi/L	1.36		(0%-20%)	GXR1	04/29/16 23:11
	Uncertainty	+/-33300		+/-33700						
QC1203536129 LCS										
Tritium	2350			2410	pCi/L		102	(75%-125%)		04/30/16 11:54
	Uncertainty			+/-461						

QC Summary

Workorder: 395827

Parmname			NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation													
Batch 1562687													
QC1203536126	MB												
Tritium					U	136	pCi/L				GXR1	04/29/16	22:55
			Uncertainty			+/-301							
QC1203536128	395827001	MS											
Tritium			4710	1.70E+06		1.62E+06	pCi/L		N/A	(75%-125%)		04/29/16	23:13
			Uncertainty	+/-33300		+/-31600							
Batch 1562691													
QC1203536142	395827001	DUP											
Carbon-14			U	14.9	U	28.0	pCi/L	N/A		N/A	TXJ1	05/03/16	17:23
			Uncertainty	+/-24.1		+/-24.9							
QC1203536144	LCS												
Carbon-14			1260			1310	pCi/L		103	(75%-125%)		05/03/16	18:26
			Uncertainty			+/-47.0							
QC1203536141	MB												
Carbon-14					U	-4.59	pCi/L					05/03/16	16:51
			Uncertainty			+/-23.6							
QC1203536143	395827001	MS											
Carbon-14			1260 U	14.9		1400	pCi/L		111	(75%-125%)		05/03/16	17:54
			Uncertainty	+/-24.1		+/-49.8							

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

QC Summary

Workorder: **395827**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

UI Gamma Spectroscopy--Uncertain identification

UJ Gamma Spectroscopy--Uncertain identification

UL Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y Other specific qualifiers were required to properly define the results. Consult case narrative.

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.